

# **Annual Reports of Chairpersons of COOMET Structural Bodies**

**2011**

## ANNUAL REPORT of Chairperson of Joint Committee for Measurement Standards

The introduction comprises the information about completed projects concerning comparisons, about CMC review and CMC published. Further the detailed reports of all TC follow.

### • Meetings TC

TC	Time	Venue
TC 1.1	—	
TC 1.2	—	
TC 1.3	18-19 October	Baku
TC 1.4	23-26 October	Ivano-Frankovsk
TC 1.5	—	
TC 1.6	—	
TC 1.7	April	Kharkov
TC 1.8	25 – 26 May	St. Petersburg
TC 1.9	—	
TC 1.10	21-22 September	Minsk
TC 1.11	—	
TC 1.12	October	Kharkov

### • Completed projects

TC	Project (comparison)	Title
TC 1.2 Acoustics. Ultrasound. Vibration	<i>431/UA/08</i>	The comparison of the measurement standards of the pressure unit in air at low frequency range
TC 1.5 Length and Angle	<i>265/UA/02</i>	Conducting of comparisons of highest accuracy interferometers for gauge blocks measurements
	<i>277/UA-a/03</i>	Conducting of comparisons of highest accuracy interferometers for gauge blocks measurements
TC 1.8 Physical Chemistry	<i>375/RU/06</i>	Pilot comparisons "Determination of gene-modified objects in food"
	<i>211/RU/06</i>	Carrying out interlaboratory comparisons on the determination of toxic microimpurities in vodkas
TC 1.10 Thermometry and Thermal Physics	<i>417/UA-a/08</i>	Supplementary regional comparisons of national standards of the unit of temperature at the fixed points of gallium melting, indium, tin and zinc freezing
	<i>495/RU-a/10</i>	The pilot thermal conductivity comparison in the range from 0.03 to 0.05 W·m <sup>-1</sup> ·K <sup>-1</sup> at temperature from 10 to 40 °C

TC	Project (comparison)	Title
<b>TC 1.12 Reference Materials</b>	<b>455/RU/09</b>	Pilot comparisons of certified reference materials of alloyed steel, type 5XB2CΦ (GSO 918-90P), X6BΦ (GSO 1527-84P) и 31X19H9MBET (GSO 2251-82)
	<b>475/RU/09</b>	Conducting of international comparison tests of CRMs for composition of graphite powder SOG – 21(a set of 5 CRM types).
	<b>502/RU/10</b>	International comparison tests of CRMs for composition of copper oxide (OM-2, OM-7)

- **CMC review**

TC	Межрегиональная	Региональная
<b>TC 1.2 Acoustics. Ultrasound. Vibration</b>	APMP – 2 AFRIMETS – 1 EUROMET - 1	
<b>TC 1.3 Electricity and Magnetism</b>	SIM - 3 APMP - 9	
<b>TC 1.6 Mass and related quantities</b>	SIM - 1 EUROMET – 1 APMP - 1	
<b>TC 1.11 Time and Frequency</b>		COOMET - 1

- **CMC published in KCDB**

TC	Country	Number of lines
<b>TC 1.2 Acoustics. Ultrasound. Vibration</b>	Ukraine	<b>1</b>
<b>TC 1.5 Length and Angle</b>	Russia	<b>1</b>
	Kazakhstan	<b>1</b>
	Belarus	<b>1</b>
<b>TC 1.8 Physical Chemistry</b>	Russia	<b>79</b>
	Belarus	<b>7</b>
	Ukraine	<b>18</b>
<b>TC 1.10 Thermometry and Thermal Physics</b>	Ukraine	<b>24</b>

Anna Chunovkina  
JCMS Chairperson

## ANNUAL REPORT of Chairperson of TC 1.1 “General Metrology”

### 1. Characteristic of the cooperation in the corresponding field

During the year within TC 1.1 there were conducted works on the following Projects:

**302/RU-a/04** Development of the schemes for conducting and of algorithms for data processing of the supplementary COOMET comparisons arranged with the aim to support the CMCs of NMIs

Coordinator – A. Chunovkina, VNIIM (Russia)

**336/RU-a/05** Development of the guidelines for COOMET key comparisons data evaluation

Coordinator – A. Chunovkina, VNIIM (Russia)

In the frames of above projects the methodical support on COOMET key and supplementary comparisons is performed.

**347/RU-a/05** Possibility of simultaneous usage of concepts “errors of measurements” and “uncertainty of measurements” in different metrological tasks

Coordinator – A. Doynikov, VNIIFTRI (Russia)

The project is completed. COOMET Recommendation R/GM/21:2011 “Use of concepts “error of measurement” and “uncertainty of measurement”. General principles materials» was developed, adopted and published on COOMET web-site.

**399/RU-a/07** Development of the methodology for uncertainty evaluation of measurement results obtained by data processing software

Coordinator – A. Chunovkina, VNIIM (Russia)

The information material was prepared for discussion on the 9th TC 1.1 meeting. Project agreed.

**420/RU-a/08** Development of the Recommendations for uncertainty evaluation in calibration

Coordinator – A. Chunovkina, VNIIM (Russia)

The draft Recommendations have been improved to accommodate the comments and proposals made by participants of 8<sup>th</sup> COOMET TC 1.1 meeting and will be discussed at 9<sup>th</sup> COOMET TC 1.1 meeting. Project agreed.

**422/RU-a/08** Development of the Recommendations «Calibration techniques. General requirements»

Coordinator – A. Doynikov, VNIIFTRI (Russia)

The first edition of draft Recommendations were sent to COOMET TC 1.1 members and will be discussed at 9<sup>th</sup> COOMET TC 1.1 meeting. Project agreed.

### 2. Changes to the COOMET Working Program

In 2011 TC 1.1 made the following changes to the COOMET Working Program:

#### Proposed – 1 new project:

**547/RU/11** Preparation for and holding the international seminar “*Mathematics, statistics and computation to support measurement quality*” and one-day satellite meeting on “*Metrological software testing*” June 5-7, 2012, St. Petersburg, Russia

#### Completed – 2 projects:

**301/UA-a/04** The development of recommendations on drawing up the calibration and measurement certificates, which are issued by COOMET national metrological institutes according to MRA

**394/RU/07** Organization of TC 1.1.COOMET meeting at NSC “IM” (Ukraine) on June 22, 2007 at the period of the workshop “Measurement uncertainty: methodology, regulation and applied aspects”

**Excluded – 2 projects:**

**209/RU/00** Development of a recommendation for applying “Guide to the expression of uncertainty in measurement”

**471/RU/09** Preparation and holding of the workshop for NMI Directors “10 years of CIPM MRA: results and perspectives of the cooperation” and 23<sup>rd</sup> JCRB meeting on the 22<sup>nd</sup> – 24<sup>th</sup> of September, 2009, in Kazan.

**3. Results of the TC last meeting**

In 2011 the meeting of COOMET TC 1.1 was not held.

**4. Information on the prospective place and date for the following TC meeting**

TC 1.1 plans to hold next meeting in **October 2012** at VNIIM, St. Petersburg, Russia.

Anna Chunovkina

Chairperson of TC 1.1

## ANNUAL REPORT of Chairperson of TC 1.2 “Acoustics, Ultrasound, Vibration”

### 1. General features of cooperation in the area

Currently, the NMIs from 15 COOMET member countries are represented in TC 1.2 “Acoustics. Ultrasound. Vibration”. Nine of them, i.e. Azerbaijan, Armenia, Belarus, Georgia, Cuba, Moldova, Russia, Uzbekistan and Ukraine submit their AUV CMCs via COOMET, while other six: Bulgaria, Germany, Lithuania, Slovakia, Romania and KDPR do this through other RMOs. Only three countries have published their CMCs in AUV by now, they are Belarus, Russia and Ukraine.

As usual, NMIs from Belarus (BelGIM), Russia (VNIIM, VNIIFTRI) and Ukraine (DP NDI “Systema”) are actively involved in the TC work. “Ukrmetrtestandart” and “Dneprstandartmetrologiya” as well as respective NMIs of Slovakia and Romania are participants of some projects of TC 1.2.

### 2. TC meetings

Meeting of TC 1.2	Line-up	Main issues discussed
2001 BelGIM, Belarus	Belarus, Russia, Slovakia, Ukraine	<ul style="list-style-type: none"> <li>- Establishment of a working group for COOMET participation in the AUV CMCs review: project No. 234/BY/01</li> <li>- State of measurements and prospective developments in AUV in the member countries</li> <li>- Preparation of CMC data</li> <li>- Trends of development and cooperation within TC 1.2</li> </ul>
2003 VNIIFTRI, Russia	Belarus, Germany, Denmark, Russia, Ukraine	<ul style="list-style-type: none"> <li>- Discussion of TC 1.2 and CCAUV cooperation in the light of the JCRB recommendation on establishing a working group for coordination of CMC-related activities</li> <li>- Discussion of projects proposed within COOMET</li> <li>- Preparation of CMC data</li> <li>- Reports and presentations on the development and research work in the AUV field in the member countries</li> </ul>
2004 DP NDI “Systema”, Ukraine	Belarus, Great Britain, Germany, Denmark, Russia, Ukraine	<ul style="list-style-type: none"> <li>- COOMET projects</li> <li>- Proposals for the meeting agenda of the RMO CCAUV Working Group</li> <li>- Comparison arrangement issues</li> <li>- EUROMET cooperation discussion</li> <li>- Reports and presentations on the development and research in AUV in the member countries</li> </ul>
2006 BelGUM, Belarus	Belarus, Russia, Ukraine	<ul style="list-style-type: none"> <li>- Discussion of the state of work on the following projects: COOMET.AUV.A-K1, COOMET.AUV.A-K1.1 and COOMET.AUV.A-K3, COOMET.AUV.V-K1</li> <li>- Proposals for COOMET Comparison Programme - Proposals for the agenda of the Working Group of RMO CCAUV meeting</li> <li>- Reports and presentations on the development and research in AUV in the member countries</li> </ul>

Meeting of TC 1.2	Line-up	Main issues discussed
2008 VNIIM, Russia	Belarus, Denmark, Cuba, Russia, Ukraine	<ul style="list-style-type: none"> <li>- Discussion of the state of work on issues of 405/RU/07, 392/UA/07, 308/RU/04</li> <li>- Proposals for COOMET Comparison Programme</li> <li>- Information about the results of Technical Committee meeting TC 87 and TC 29 IEC</li> <li>- Proposals for the agenda of the Working Group of RMO CCAUV meeting and for the Classification of Services</li> <li>- Reports and presentations on the development and research in AUV in the member countries</li> </ul>
2010 DP NDI “Systema”, Ukraine	Belarus, Denmark, Poland, Russia, Slovakia, Ukraine	<ul style="list-style-type: none"> <li>- Draft B Reports on the key comparisons COOMET.AUV.A-K2 and COOMET.AUV.V-K1</li> <li>- CCAUV Services Classification (version 2.0, October 2002, updated in October 2004) in Russian</li> <li>- providing methodological aid to the COOMET member countries, that have not yet submitted their AUV CMC data;</li> <li>- establishing the post of deputy chairmen of TC in accordance to the decision of the 8th meeting of JCS</li> <li>- Proposals for COOMET Comparison Programme</li> </ul>
It is planned to hold the 7 <sup>th</sup> regular meeting of TC 1.2 within the period from May to June 2012 in Denmark at DPLA and “Brüel & Kjaer Sound & Vibration Measurement A/S”		

### 3. Status of COOMET projects in AUV

Project No	Description	KCDB code	Pilot of project	Status
234/BY-01	Establishment of a working group for COOMET participation in the AUV CMCs review		V. Pozdeeva, BelGIM, Belarus	Working Group of experts from COOMET NMIs has been active in this field since January 2002
323/UA/04	Comparison for primary method of pressure calibration of laboratory standard microphones over the frequency range from 20 Hz to 20 kHz	COOMET.AUV.A-K3	Dr. K. Rasmussen, DPLA, Denmark	<b>Results published in</b> <a href="#">Metrologia, 2007, 44, Tech. Suppl., 09002</a> Participants of comparison: Denmark, Ukraine, Russia, Poland, Romania
226/DE-01	Comparison of calibrations of laboratory standard microphones (63 Hz – 10 kHz)	COOMET.AUV.A-K1	Dr. T. Fedtke, PTB, Germany	<b>Results published in</b> <a href="#">Metrologia, 2009, 46, Tech. Suppl., 09004</a> Participants of comparison: Ukraine, Russia, Germany, Poland, Turkey
316/UA/04	Bilateral comparison by calibration of type LS1P microphones	COOMET.AUV.A-K1.1	Dr. T. Fedtke, PTB, Germany	<b>Results published in</b> <a href="#">Metrologia, 2009, 46, Tech. Suppl., 09005</a> Participants of comparison: Ukraine – Germany

Project No	Description	KCDB code	Pilot of project	Status
308/UA/04	Key comparison of national standards for vibration parameters (in regard to sinusoidal acceleration) over the frequency range from 20 Hz to 5000 Hz	COOMET. AUV.V-K1	Dr. V. Smimov, VNIIM, Russia	<b>Draft B available</b>  Participants of comparison: Russia, Belarus, Poland, Ukraine, Romania, Turkey
337/BY/05	Bilateral comparison of national standards by pressure calibration of microphones type WS1 and WS2 using electrostatic actuator technique	pilot	V. Pozdeeva, BelGIM, Belarus	<b>Comparison finished in 2006</b>  Participants of comparison: Russia – Belarus  <b>Research report is available</b>
369/BY/06	Bilateral comparison of the national sound pressure standards	pilot	V. Pozdeeva, BelGIM, Belarus	<b>Comparison finished in 2007</b>  Participants of comparison: Russia – Belarus  <b>Research report is available</b>
434/BY/08	Comparison of national standards for sound pressure in air (Pa) using calibrations of working standard microphones	COOMET. AUV.A-S1	V. Pozdeeva, BelGIM, Belarus	<b>Draft B available</b>  BelGIM, Belarus; “VNIIFTRI”, Russia; SMU, Slovakia; DP NDI “Systema”, Ukraine
392/UA/07	Comparison of the national standards for sound pressure in air over the low frequency range from 2 Hz to 125 Hz	pilot	Dr. V. Chaly, DP NDI “Systema”, Ukraine	<b>Comparison finished in 2008</b>  Report is available  Participants of comparison: Ukraine – Russia
431/UA/08	Comparison of national standards for sound pressure in air over a low-frequency range	COOMET. AUV.A-K2	Dr. V. Chaly, DP NDI “Systema”, Ukraine	<b>Results published in</b> <a href="#">Metrologia, 2011, 48, Tech. Suppl., 09002</a>  Participants of comparison: DP NDI “Systema”, Ukraine; “VNIIFTRI”, Russia
405/RU/07	Comparison of the national standards for sound pressure in water over infrasonic and low audio frequency range (2 Hz to 4 kHz)	pilot	Dr. A. Isaev, VNIIFTRI, Russia	<b>Comparison finished in 2008</b> <b>Report available</b>  Participants of comparison: Ukraine – Russia



Project No	Description	KCDB code	Pilot of project	Status
448/RU/08	Comparison of measurements of the velocity of longitudinal ultrasonic wave propagation in solid media	pilot	V. A. Lugovoi, Far East Office of “VNIIFTRI”, Russia	<b>Comparison finished in 2010</b> <b>Report submitted to the Secretariat of COOMET</b>  Far East Office of “VNIIFTRI”, Russia; BelGIM, Belarus
482/BY/09	Comparison of measurements of the velocity of longitudinal ultrasonic wave propagation in solid media by pulse method	pilot	V. V. Pozdeeva, A. A. Dobrov, BelGIM, Belarus	<b>Measurements are finished</b>  <b>Draft B available</b>  BelGIM, Belarus; “Ukrmetrtestandart”, Ukraine; “Dneprstandartmetrologiya”, Ukraine
473/RU-a/09	Pilot comparison of the national standards for sound pressure in water (in regard to hydrophone calibration in free field) over the frequency range from 250 Hz to 200 kHz	pilot	A.E.Isaev, VNIIFTRI, Russia	<b>Comparison finished in 2010</b> <a href="http://www.bipm.org/cc/CCAUV/Restricted/7/CCAUV-10-20.pdf">http://www.bipm.org/cc/CCAUV/Restricted/7/CCAUV-10-20.pdf</a>  VNIIFTRI, Russia; HAARI, China
531/RU/11	Comparison of hydrophone calibrations in free field over the low frequency range (250 Hz to 8 kHz) under the conditions of a laboratory tank		Proposed by  A. E. Isaev, VNIIFTRI, Russia	VNIIFTRI, Russia; HAARI, China
535/UA/11	Comparison of the national standards of ultrasound power over the frequency range from 2 to 15 MHz		Proposed by  V. Chaly, DP NDI “Systema”, Ukraine	VNIIFTR, Russia; DP NDI “Systema”, Ukraine

Currently, there are 14 completed projects:

275/RU/03, 309/UA/04, 485/UA/10 (meetings of TC 1.2), 300/BY/04, 323/UA/04, 337/BY/05, 369/BY/06, 226/DE/01, 316/UA/04, 392/UA/075, 405/RU/07, 448/RU/08, 431/UA/08, 473/RU-a/09;

3 – on-going projects: 308/UA/04; 434/BY/08; 482/BY/09;

2 – planned;

1 – permanent project 234/BY/01 established at the 1st meeting of TC.

#### 4. Work on implementation of the CIPM MRA

##### 4.1. Status of the AUV CMCs of COOMET NMIs

In 2011, CMCs of Ukraine COOMET.AUV.6.2011 based on the results of comparisons in the field of low frequency acoustics (pilot comparison No. 392/UA/07 and key comparison COOMET.AUV.A-K2) were published.

##### Status of the CMCs in AUV published in the KCDB

KOOMET	APMP	EURAMET	SADCMET	SIM
COOMET.AUV.1.2001	APMP.AUV.1.2003	EUROMET.AUV.1.2001	SADCMET.AUV.1.2005	SIM. AUV.1.2003
COOMET.AUV.2.2003	APMP.AUV.2.2006	EUROMET.AUV.2.2001	AFRIMETS.AUV.2.2010	
COOMET.AUV.3.2005	APMP.AUV.3.2006	EUROMET.AUV.3.2003		
COOMET.AUV.4.2007	APMP.AUV.4.2008	EUROMET.AUV.4.2004		
COOMET.AUV.5.2009	APMP.AUV.5.2009	EUROMET.AUV.5.2004		
COOMET.AUV.6.2011	APMP.AUV.6.2009	EUROMET.AUV.6.2005		
		EUROMET.AUV.7.2007		
		EUROMET.AUV.8.2008		
		EUROMET.AUV.9.2010		
		EUROMET.AUV.10.2011		

##### 4.2. COOMET participation in the interregional review of CMCs

In 2011, interregional review of the following CMCs was performed:

CMC	Target date	Date of publication of review results
APMP.AUV.8.2011	Not set	2011-09-13
APMP.AUV.9.2011	2011-11-14	2011-11-11
AFRIMETS.AUV.3.2011	2011-12-29	
EUROMET.AUV.10.2011	2011-03-21	2011-03-03

#### 5. Cooperation in AUV with the relevant international and regional organizations

TC 1.2 continues to cooperate in AUV both with the international and regional organizations.

Since 2004, members of TC 1.2 have attended the meetings of CIPM Consultative Committee for AUV and its Working Groups: RMO Working Group for CMC (CCAUV RMO WG) and Strategic Planning Working Group (CCAUV SPWG). Joint comparisons between COOMET and EURAMET or COOMET and APMP are conducted; representatives of COOMET participate in the meetings of TC AUV EURAMET. In turn, representatives of TC AUV EURAMET have taken part in 4 of 6 meetings of TC 1.2.

Additionally, members of TC 1.2 participate in the meetings of IEC/TC and IEC/TC 87 on the continuous basis. For instance, in 2011 the representatives of the TC took part in the activities of the Working Groups WG5 and WG17 of IEC/TC 29, which met at the British Standards Institute in London and WG6, WG8, WG9 and WG14 IEC/TC 87, which met on the premises of VNIIFTRI in Moscow.

Valentina Pozdeeva  
Chairperson of TC 1.2

## **ANNUAL REPORT of Chairperson of TC 1.3 “Electricity and Magnetism”**

### **1. General information**

The members of TC 1.3 are the representatives of 17 countries that are COOMET members: Armenia, Azerbaijan, Belarus, Bulgaria, Cuba, DPR of Korea, Georgia, Germany, Kazakhstan, Kyrgyzstan, Lithuania, Moldova, Romania, Russia, Slovakia, Uzbekistan and Ukraine.

It is known that NMIs of a number of COOMET member countries submit their CMCs through other Regional Metrology Organizations. For instance, Germany, Slovakia, Lithuania, Bulgaria and Romania present their CMC data via EURAMET.

The main task of the TC is the realization of COOMET members' cooperation in the area “Electricity and Magnetism” including the following activities:

- Arranging of the key and supplementary regional comparisons of national standards of COOMET member countries;
- Preparation and intra-regional review of Calibration and Measurement Capabilities (CMC-files) of the COOMET members;
- Cooperation with the corresponding Technical Committees of other Regional Metrology Organizations, participation in the inter-regional CMC review.

### **2. Meetings of TC**

The fifth meeting of TC 1.3 was held in Baku in October 2011.

15 representatives from nine countries (Azerbaijan, Belarus, Germany, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia and Ukraine) attended the meeting. They were members of TK 1.3, leading experts in the field of “Electricity and Magnetism” of NMIs of COOMET as well as invitees.

It should be noted that there is a slight but sure growth trend in the number of countries and representatives participating in the TC meetings. Particularly, the representatives of Kazakhstan are those who engage in the work of the TC very actively

The meeting was held in accordance with the agenda approved by the meeting participants.

The following was presented and heard during the meeting:

- Report given by the chairperson of TC 1.3 on the results of work for the past period; this TC 1.3 chair report was taken into consideration;
- Information about the 21<sup>st</sup> meeting of COOMET (TC chair);
- Discussion of the progress on COOMET projects being fulfilled within the TC (TC members and project coordinators);
- Discussion of the Report B on 396/UA/07 (project coordinator);
- Information about final activities on 345/UA/05 (project coordinator, representative of VNIIM, representative of PTB);
- Discussion of other projects;
- Information of all meeting participants on topical issues in the field "Electricity and Magnetism";
- Information given by the participants on activities related to "Electricity and Magnetism" that are carried out by their National metrological services; information concerning prospective activities aimed at establishing the measurement standard base; information on programs meant for developing and improving the measurement standard base;
- Issues regarding CMC files and activities for implementing the MRA, topical problems concerning this type of measurements in the participating countries.

Minutes of the meeting was signed by all participants, translated into English and submitted to all TC members for consideration and implementation as well as for suggestions and additions.

### 3. State of COOMET Projects

Comparison activities are being exercised in accordance with the agreed Program. Regarding the projects:

- **396/UA/07** – project coordinator V.N. Kikalo, SE "Ukrmetrteststandart". Report B shall be approved and submitted for publication in Appendix KCDB;
- **470/-a/09** – project coordinator B.V. Zakharov, FGUE "UNIIM". Measurements are finished. The project coordinator shall submit the information concerning the progress of presentation of comparison results;
- **513/DE-a/10** – project coordinator E. Mons, PTB Measurements are finished; Report A is being prepared.
- **516/RU/11** – FGUE "UNIIM". A form for the agreed project shall be prepared, data shall be submitted for registration in the KCDB;
- **345/UA/05** – project coordinator A.A. Ahmadow, SE "Ukrmetrteststandart". Final Report A is prepared. The work is in progress on coordinating the measurement results obtained by link institutes VNIIM and PTB respectively according to the Decision of the 9<sup>th</sup> meeting of JCMS; this work should be finished before the end of 2011.
- **344/UA/05** – project coordinator A.A. Akhmadov, SE "Ukrmetrteststandart". The project coordinator and the chair of TC 1.3 are advised to invite FGUE "VNIIM" before the end of 2011 to take part in the comparisons as a link institute.
- **267/RU/02** – project coordinator C.A. Kolotygin, FGUE "VNIIFTRI". Measurements are finished; Report A is being prepared.
- **411/RU-a/07** and **449/RU/08** – project coordinator B.B. Kiselev, FGUE "VNIIMS". Measurements are finished; Report A is being prepared.
- **468/RU/09** – project coordinator A.V. Mylnikov, FGUE "VNIIFTRI". A form for the agreed project shall be prepared; data shall be submitted for registration in the KCDB;
- **469/RU/09** – project coordinator EA. Abrosimov, FGUE "SNIIM". Measurements are being continued;
- **273/RU-a/03** – project coordinator G.P. Telitchenko, FGUE "VNIIM", the TC chair should verify the condition of the appropriate reporting documents. Project is finished;
- **530/BY/11** – project coordinator P.A. Tchernyaev, BelGIM. Measurements are finished; Report B is prepared and submitted to the working group for consideration.

### 4. Liaisons with international and regional organizations

The recent meeting of the WG-CCEM was held in March 2011. At my request, Mr. Hans Bachmair (PTB) presented us information on this event during the meeting of TC 1.3 in Baku.

### 5. Work in the field of the appendix C of the mutual recognition agreement

Currently COOMET is represented in the BIPM database (Appendix C) through the CMC data of Russia, Belarus and Ukraine as well as Germany, Slovakia, Bulgaria and Romania (these countries submitted their data through EURAMET).

In 2011, COOMET did not submitted any CMC data in the field "Electricity and Magnetism" for inter-regional review.

In 2011, experts of TC 1.3 accomplished the inter-regional review of the CMC files of 3 SIM countries and 9 APMP countries.

### 6. Time and place of the next TC meeting

Time and place of the next TC meeting: October 2012 Astana (Kazakhstan).

Tatyana Kolomiets  
Chairperson of TC 1.3

## ANNUAL REPORT of Chairperson of TC 1.4 “Flow Measurement”

### 1. General characteristics of cooperation in the field of flowmetry

Technical Committee 1.4 realizes the COOMET work in the field of metrological assurance of flow measurements of fluid, including oil and oil products natural and liquefied gas.

On this basis and also taking into account today's realities within TC 1.4 there are created three Subcommittees, represented in table 1.

Table 1

Subcommittee ID	Name	Chairperson	Location
SC 1.4.1	Gas Flowmetry	Mr. Nikolay Martynov	BelGIM, Republic of Belarus
SC 1.4.2	Oil Flowmetry and Oil Products	Dr. Gennadiy Khomyakov	VNIIR, Russian Federation
SC 1.4.3	Flowmetry of Liquefied Gas	Mr. Reshat Sabirgaliev	ZKF RGP “KazInMetr”, Republic of Kazakhstan

So today TC 1.4 is completely created capable of functioning structure, which includes three Subcommittees and unites 17 COOMET corresponding member countries.

A new member of COOMET – Tajikistan has not been introduced to the TC 1.4 yet.

One of the main tasks, solved by TC, was and is the task of cooperation organization of National Metrological Institutes (NMI) of COOMET member countries in the field of flowmetry with the aim of work activation in this kind of measurements, realization of Agreement on mutual recognition of national standard units of liquid and gas, appropriate calibration certificates and measurements, issued by NMI.

Together with the solution of this basic task i.e. organization and conduction of national measurement standards TC 1.4 members participated in reporting period in the development and actualization of normative COOMET base, i.e.

- R/GM/11:2010 “COOMET Recommendations “STATEMENT about comparisons of National Metrological Institutes of COOMET”.
- Project of COOMET Recommendations “PROCEDURE of forming, conducting expertise and publishing at COOMET website the data on calibration and measuring service of metrological laboratories (centres) of member countries”.

Today there is conducted the work on activity presentation of the TC 1.4 “Flow Measurement” in the appropriate chapter of COOMET web-portal.

### 2. TC work on COOMET Projects

Work of TC 1.4 on the comparisons of national measurement standards, being conducted in the reporting period, is represented in table 2.

Table 2

JCRB code	COOMET project ID	Description/ range	Field	Pilot	Coordinator	State of work/ Status of comparisons	Starting and end date of work
<b>COMPARISONS</b>							
COOMET.M.F F-S2	406/UA/07	Mass, volume liquid flow 60 kg/h – 10 <sup>5</sup> kg/h, 0.06 m <sup>3</sup> /h – 100 m <sup>3</sup> /h	Mass/ flow	PTB	Dr. Gudrun Wendt	Measurements were completed, Draft A is being prepared.  Supplementary	2008-2012

JCRB code	COOMET project ID	Description/ range	Field	Pilot	Coordinator	State of work/ Status of comparisons	Starting and end date of work
COOMET.M.F F-S3	412/UA/07	Gas flow, 4 m <sup>3</sup> /h – 160 m <sup>3</sup> /h	Mass/ flow	GP “Ivano- Frankovskstandart metrologiya”	Mr. Denis Serdyuk	Draft B is being prepared  Supplementary	2008-2012
COOMET.M.F F-S4	452/SK/09	Water flow, 3 m <sup>3</sup> /h – 20 m <sup>3</sup> /h	Mass/ flow	SMU	Ms. Miroslava Benkova	Draft B is being prepared  Additional	2009-2012
CCM.FF-K6b	–	Water flow, 2 m <sup>3</sup> /h – 100 m <sup>3</sup> /h	Mass/ flow	SMU	Ms. Miroslava Benkova	Measurements are being carried out  Key	2010-2012

#### 406/UA/07 Comparisons of national standards of mass units and volume liquid flow

Participants: PTB, BelgIM, VNIIR, LEI (Lithuania), NSC “Institute of Metrology” (Ukraine), SMU(Slovakia), TsNE RUz (Uzbekistan)

Stage of measurements, according to the technical protocol, was completed; the results of the conducted measurements are being prepared, Draft A is being prepared. Taking into account the delays in conducting of works determined by the customs difficulties when transfer standards were crossing a lot of borders and by other objective reasons, the end date of the project has been prolonged till the end of 2012 at the 8<sup>th</sup> meeting of TC 1.4 (October 2011, GP “Ivano-Frankovskstandartmetrologiya”, Ukraine).

#### 412/UA/07 Realization of comparisons of standard testing equipment in the gas flow range (4 – 160) m<sup>3</sup>/h

Participants: LEI, VNIIR, SMU, GP “Ivano-Frankovskstandartmetrologiya” (Ukraine)

Comparisons have practically been completed: obtained results were processed, Draft A was prepared and distributed among the participants of the comparisons at the 8<sup>th</sup> meeting of TC with the aim of discussing and preparing taking into account the made notes of the appropriate Draft B.

#### 452/SK/09 Comparisons of calibration laboratories in the field of cold water flow in the flow range from 3 m<sup>3</sup>/h to 20 m<sup>3</sup>/h

Comparisons are interregional; calibration laboratories of COOMET and SIM i.e. SMU, INIMET (Cuba), CENAM (Mexico), LEI, State enterprise “Ukrmetrteststandart” (Ukraine), NISM are participating in these comparisons.

Comparisons are conducted according to the Technical Protocol: measurements were completed, Draft A, agreed by the participants, was prepared and presented at the 8<sup>th</sup> meeting of the Technical Committee; Draft B is being prepared.

According to the decision of the 8<sup>th</sup> meeting of TC Drafts B on the considered COOMET projects i.e. 406/UA/07, 412/UA/07 and 452/Sk/09 must be prepared and presented at the 9<sup>th</sup> meeting of TC 1.4 (October 2012, PTB).

Together with listed supplementary comparisons TC 1.4 conducts key comparisons of the Primary (national) measurement standards of gas flow under low pressure in the range from 2 m<sup>3</sup>/h to 100 m<sup>3</sup>/h, registered in KCDB as **CCM.FF-K6b**; pilot organization – SMU under the support of PTB; coordinator – Ms. Miroslava Benkova. She is in charge of the Consultative Committee for flowmetry (CMM) CIPM. Comparisons are interregional; 12 NMIs from AFRIMETS, APMP, EURAMET, COOMET, SIM are participating in the comparisons (COOMET is represented by SMU, PTB and GP “Ivano-Frankovskstandartmetrologiya”, Ukraine).

In the capacity of **proposed COOMET projects** in the TC 1.4 there are considered the following ones, represented in table 3:

Table 3

Proposed project ID	Project name	Proposed by	Organization, country
499/BY/10	Development of harmonized methods of conducting the measurements of natural gas with the help of gas meters	N. Martynov	BelGIM, Belarus
532/UA/11	Comparison of measurement standards in the field of hot water flow measurement	J. Kuzmenko	SE “Ukrmetr-teststandart”, Ukraine
543/UA/11	Comparison of measurement standards in the field of natural gas flow measurement in the range from 25 m <sup>3</sup> /h to 5000 m <sup>3</sup> /h	V. Bolshakov	NSC “Institute of Metrology”, Ukraine

An issue concerning the organization effectiveness and coordinator of COOMET Project: “Comparison of measurement standards in the field of natural gas flow measurement in the range from 25 m<sup>3</sup>/h to 5000 m<sup>3</sup>/h” is being discussed. Supposed participants: PTB, VNIIR, BelGIM, NSC “Institute of Metrology”, GP “Ivano-Frankovskstandartmetrologiya”, corporate enterprise “Energouchet” (Ukraine). The aim of the project is to determine the equivalence of measurement standards in the field of gas flow measurement, based on different physical principles.

Possible form and degree of participation of TC 1.4 members in the proposed COOMET Project 492/DE/10 “Development of conception of joint scientific research in the field of metrology in COOMET member countries” is being determined. It’s proposed by Dr.-Ing. Klaus-Dieter Sommer, PTB.

### 3. TC work on CMC review

At the present time TC 1.4 conducts:

- regional CMC assessment of
  - NSC “Institute of Metrology” in the field of volume, mass and liquid flow measurements (expert: SMU) and
  - National Institute of Standardization and Metrology of Moldavia (NISM) in the field of volume and gas flow measurements (expert: NSC “Institute of Metrology”), and also
- regional CMC assessment of Vietnamese Metrological Institute (VMI) in the field of volume and water and gas flow measurements (registration in the JCRB: APMP.M.30.2011 (expert: NSC “Institute of Metrology”).

In order to provide qualified comparisons and CMC assessment of NMI for flowmetry Technical Committee has developed the following items, confirmed by the COOMET Committee:

- actualized classifier of services in the field of fluid flow measurements and
- composition of group of experts in the field “Flow Measurement”.

### 4. Interaction with international and regional organizations

For efficient decision of the tasks of TC it is regulated active cooperation with consultative Committee of BIPM on flowmetry – CCM Working Group on Fluid Flow (WGFF) and Responsible secretary of KCDB. With the aim of work coordination, conducted by Technical Committee and more effective interaction with BIPM the TC member Dr. Gudrun Wendt (PTB) is included into WGFF. She participated in all the meetings of the Working Group and particularly in the last one – WGFF-2011, Sevres, France.

The Chairperson of TC is included into editorial staff of international journal “MetEFF” (“Energy measurement and liquid flow”).

As I have already noted, with the regional metrological organizations as AFRIMETS, APMP, EURAMET and SIM there are conducted joint comparisons of hydrometric calibration laboratories on Project COOMET.M.FF-S4 and national measurement standards of gas flow on Project CCM.FF-K6b.

As COOMET Secretariat is located in NSC “Institute of Metrology” we have the most constructive relationship with it.

TC members took part in

- the 20<sup>th</sup> meeting of COOMET Committee and 9<sup>th</sup> meeting of Joint committee on standards (April 2011, Yerevan, Armenia),
- the 13<sup>th</sup> meeting of Consultative Committee for mass (CCM) and the meeting of CIPM Working Group for flow measurement (WGFF-2011),
- the 21<sup>st</sup> international symposium “Metrology and Metrology Assurance-2011” (12-14 September 2010, Sozopol, Bulgaria),
- the 1<sup>st</sup> international scientific conference “Measurements, control and diagnostics in the measurement instruments” (October 2011, Vinnitsa, Ukraine)

## 5. Results of the last meeting of TC and implementation of its decisions

The last 8<sup>th</sup> meeting of TC 1.4 was held on 23-26 October 2011 in GP “Ivano-Frankovskstandart-metrologiya”, Ivano-Frankovsk, Ukraine. 10 TC members took part in its work, representing NMIs of 9 following countries: Belarus, Germany, Kazakhstan, Kyrgyzstan, Moldova, Russian Federation, Rumania, Slovakia and Ukraine. And also 13 registered guests of the meeting from NMIs of Russian Federation, Romania, Slovakia and Ukraine took part in the work of TC.

The work of the meeting was conducted on the agreed before Program (via e-mail). Constructive decisions were taken on all points, what is reflected in the Decisions of the meeting, i.e.

- dynamics of cooperation within the TC “Flow Measurement” is evaluated as positive, the work as constructive, which sign is conducting of works both on the supplementary comparisons of national standards of fluid flow (Project 406/UA/07) and reference measurement instruments of gas flow (Project 412/UA/07) of COOMET member countries, interregional comparisons of calibration laboratories of NMI of COOMET and SIM in the field of cold water flowmetry (Project 452/Sk/09) and on key interregional comparisons of primary standards of gas under low pressure of 11 NMIs from AFRIMETS, APMP, EURAMET, COOMET and SIM (CCM.FF-Kb.2011);
- it's decided to take into consideration Drafts A on conducted measurements on the COOMET Projects 412/UA/07 and 452/Sk/09;
- it is recommended efficiently:
  - to prepare taking into account comments made and to present Draft B on the Project 412/UA/07 in the first quarter of 2012, on the Projects 406/UA/07 and 452/Sk/09 at the 9<sup>th</sup> TC 1.4 meeting (October 2012);
  - to transfer the Proposed COOMET Project into Agreed COOMET Project;
  - to determine associates and coordinators in the Proposed COOMET Projects 499/BY/10 and 543/UA/11;
  - to close as completed COOMET Projects 191/RU/BY-a/99 and 433/BY/08;
  - to distribute the Minutes of the 8<sup>th</sup> COOMET TC 1.4 meeting among the TC members, to the Chairperson of JCMS and to the COOMET Secretariat till 26.11.2011.

It's planned to conduct the 9<sup>th</sup> meeting of the COOMET TC 1.4 “Flow Measurement” from the kind offer of Dr. Gudrun Wendt in PTB, Braunschweig, Germany on 22-25 October 2012.

The complete text of the Minutes and Decisions of the 7<sup>th</sup> meeting of TC 1.4 “Flow Measurement” is posted at the appropriate page of the COOMET web-portal.

Prof. Vladimir Bolshakov  
Chairperson of TC 1.4



## ANNUAL REPORT of Chairperson of TC 1.5 “Length and Angle”

Much organizational work was done in the reporting period. Several COOMET projects were completed; the final results and CMC-entries were published in the KCDB.

There is a long list of comparisons of national measurement standards. They are given below.

### Completed projects

No.	Project ID	Project name
1	<b>265/UA/02</b>	Conducting of comparisons of highest accuracy interferometers for gauge blocks measurements (100 mm)
2	<b>277/UA-a/03</b>	Conducting of comparisons of highest accuracy interferometers for gauge blocks measurements (up to 1 m)
4	<b>390/BY/07</b>	International comparison of length standards in the range measurement of gauge blocks (up to 100 mm)
5	<b>507/BY/10</b>	Comparison of standards of unit of length to measure parameters of gear wheels

**265/UA/02** Conducting of comparisons of highest accuracy interferometers for gauge blocks measurements (100 mm)

Project was completed; report was published in the KCDB. CMC-entries of NMI corresponding to this comparison were subscribed for confirmation. In the course of comparisons the participants confirmed CMC-entries they had, Ukraine ( $[20 + 0.2L]$  nm, L in mm). KazInMetr registered and published a new CMC in the KCDB ( $[20 + 0.35L]$  nm, L in mm).

**277/UA-a/03** Conducting of comparisons of highest accuracy interferometers for gauge blocks measurements (up to 1 m)

Project was completed; report was published in the KCDB. CMC-entries of NMI KazInMetr corresponding to this comparison were subscribed for confirmation. In the course of comparisons the participants confirmed CMC-entries they had, Ukraine ( $[20 + 0.2L]$  nm, L in mm), Russia ( $[30 + 0.20L]$  nm, L in mm). KazInMetr registered and published a new CMC in the KCDB, ( $[15 + 0.207L]$  nm, L in mm).

**390/BY/07** International comparison of length standards in the range measurement of gauge blocks (up to 100 mm)

Project was completed; the documents are being prepared for the publication in the KCDB. In the course of comparisons the participants confirmed CMC-entries they had.

Belarus ( $[30 + 0.2L]$  nm, L in mm),

Ukraine ( $[20 + 0.2L]$  nm, L in mm),

Poland ( $[34 + 0.44L]$  nm, L in mm),

Kazakhstan ( $[20 + 0.35L]$  nm, L in mm).

**507/BY/10** Comparison of standards of unit of length to measure parameters of gear wheels

Project was completed; Report A was prepared. The final report and registration in the KCDB are being prepared.

During 2011 there were published CMC-entries of UNIIM (Russia) ( $0.2L \mu\text{m}$ , L in m) and of RGP “KazInMetr” (Kazakhstan) ( $0.2L \mu\text{m}$ , L in m) on linearity; comparison was completed in 2010, however a prolonged assessment didn’t allow publishing the entries by the last meeting of the TC. BelGIM (Belarus), being a participant of the comparisons has confirmed his values of CMC-entries ( $0.2L \mu\text{m}$ , L in m).

**Agreed (on-going) comparison projects:**

No.	Project ID	Project name
1	<b>524/UA-RU/11</b>	Comparison of national measurement standards of plane angle unit
2	<b>501/UA/10</b>	Comparison of measurement standards of flatness of optical surfaces
3	<b>450/UA/09</b>	Comparison of reference instruments of unit of length for parameters of roughness
4	<b>278/UA-a/03</b>	Conducting of comparisons of line scales comparators
5	<b>440/RU/08</b>	International comparison of stabilized He-Ne/I <sub>2</sub> lasers at 633 nm

**524/UA-RU/11** Comparison of national measurement standards of plane angle unit

Technical protocol of the comparisons was agreed and measures were transferred to SE “Ukrmetrteststandart”, Ukraine, and they are being measured. The timetable of comparisons is the following:

NMI	Country	Date of conduction
SE “Ukrmetrteststandart”	Ukraine	November 2011
RGP “Kazakhstan Institute of Metrology”	Kazakhstan	December 2011
RUE “Belarussian State Institute of Metrology”	Belarus	February 2012
Slovak Institute of Metrology, Centre for Length, Time and Acoustics	Slovakia	March 2012
Physikalisch-Technische Bundesanstalt	Germany	April 2012

Cuba is expected to be a participant of the comparisons.

**501/UA/10** Comparison of measurement standards of flatness of optical surfaces

The measurements were conducted by two participants of the comparisons, an issue as for further shipment of measures is being decided.

**450/UA/09** Comparison of reference instruments of unit of length for parameters of roughness

The measurements are conducted by two participants of the comparisons, an issue as for further shipment of measures is being decided.

**278/UA-a/03** Conducting of comparisons of line scales comparators

The project was prolonged since RGP “KazInMetr” expressed his wish to participate in the comparisons. However, technical difficulties in the RGP “Kazakhstan Institute of Metrology” don’t allow conducting measurements for the moment. One plans to close the project.

**440/RU/09** International comparison of stabilized He-Ne/I<sub>2</sub> lasers at 633 nm

Project was completed; Report A was prepared and the results are being agreed. The final report and registration in the KCDB are being prepared.

The Technical Committee prepared a list of proposed comparison projects.

**Proposed projects**

No.	Project ID	Project name
1	370/RU/06	Interlaboratory comparison of length standards in the nanometer range
2	527/RU/11	Additional comparisons of surface density of coatings
3	529/RU/11	International comparison of interferometers for measuring 20-meter long tapes

**370/RU/06** Interlaboratory comparison of length standards in the nanometer range

NSC “Institute of Metrology” (Ukraine) and NIICPV (pilot organization, Russia) have confirmed their participation in this comparison.

**527/RU/11** Additional comparisons of surface density of coatings.

The project is open, it replaces the **Project 443/RU/08** “Comparisons of national standards in the area of measuring surface density of coatings within the range of (0.001-1.000) kg/m<sup>2</sup> and coating thickness within the range of (1-100) μm”, UNIIM should finalize the registration of the project as agreed.

**529/RU/11** International comparison of interferometers for measuring 20-meter long tapes  
Comparison is being prepared. Technical protocol was prepared.

Doing its work the committee faced a problem connected with the analysis of CMC-files obtained from different NMIs. Great attention should be paid to the issue of uncertainty budgets and further calculations.

It's reasonable to conduct training workshops and to train specialists on this issue involving the leading specialists in this field.

It's also reasonable to organize more accurate coordination of the activities of the CMC experts in order to avoid prolonged delays in the CMC analysis.

With the aim to increase the amount of CMC-entries for COOMET Member Countries, the Technical Committee 1.5 “Length and Angle” submits for consideration a proposition concerning the organization of new comparisons, which would provide an opportunity for Member Countries to get new CMC-entries in the KCDB.

It's proposed to organize comparisons on the following measurement facilities from the CMC classifier:

L.2.1.2.	Electronic Distance Measurement (EDM) instrument: error of indicated distance	Электронные измерения расстояния: погрешность индицируемого расстояния
L.2.3.9.	Engineer or machinist scale, steel: line spacing	Инженерная или слесарная линейка, сталь: линейный интервал
L.3.3.1.	Autocollimator: error of indicated angle, axes orthogonality	Автоколлиматор: погрешность показываемого угла, ортогональность осей
L.3.3.2.	Electronic level: error of indicated inclination angle	Электронный уровень: погрешность показываемого угла отклонения
L.3.3.3.	Clinometer: error of indicated inclination angle	Инклинометр: погрешность показываемого угла отклонения
L.3.3.4.	Spirit (bubble) level: error of indicated inclination angle	Уровень со спиртовым пузырьком: погрешность показываемого наклонного угла
L.4.1.3.	Surface plate: flatness	Поверочная плита: плоскостность
L.6.1.1.	External micrometer: error of indicated size	Внешний микрометр: ошибка показываемого размера
L.6.1.2.	Micrometer head: error of indicated displacement	Микрометрическая головка: погрешность показываемого смещения
L.6.1.3.	Depth micrometer: error of indicated depth	Микрометр-глубиномер: погрешность показываемой глубины
L.6.1.4.	Caliper: error of indicated size	Штангенциркуль: погрешность показываемого размера
L.6.1.5.	Depth gauge: error of indicated depth	Глубиномер: погрешность показываемой глубины
L.6.4.	Long distance	Большие длины
L.6.4.1.	Geodetic baseline: interval distances	Геодетическая базовая линия: расстояния между базисами
L.6.5.2.	Sieve or mesh opening: size or shape of the aperture	Сито или размер ячейки (сита): размер или форма отверстия

**From the interesting events in 2011:**

On 27 May, 2011 in Prague, Czech Republic, there was held the 3<sup>rd</sup> final Workshop on the project EMRP JRP 3.1 “Long distance measurement in air”, which was being conducted in terms of European research program EURAMET under financial support of European NMIs of European Commission.

The main purposes of this project were:

- developing and assessment of a new technology and measurement apparatus, exceeding reached modern level to measure long distances in air. Given accuracy is  $10^{-7}$ ;
- reliable and traceable system to estimate an effective refractive index for measurement in the open air higher than 1 km;
- interferometer and pulse systems for measuring long distances in the open air and under shop conditions;
- new systems for calibration of geodesic bases.

Resulting material and complete information about this project is available on the web-site [www.longdistanceproject.eu/](http://www.longdistanceproject.eu/).

Obtained results from the project are planned to use in the production of large-size products and to provide traceability of measurements when verifying global mapping systems.

In accordance with the purposes of the project issues examined at the workshop concerned the following directions:

- refractive index of air and spectroscopic measurements;
- interferometry with a synthesized wavelength;
- measurement of the distance using femtosecond lasers;
- apparatus for measurement in the open air;
- comparisons of the results of calibrations of geodesic bases.

From the topics of reports and presentations presented by the scientists from European NMIs of Germany, France, Finland, Italy, Spain, the Netherlands, Czech Republic and Austria one can mark out the following ones:

- compensation of the refractive index using laser spectroscopy;
- absolute distance measurements with the help of high resolution spectral interferometry;
- four-wave interferometer with a compensation of the refractive index;
- extensometer with submicron resolution on the basis of interferometry with a synthesized wavelength;
- distance measurement on the basis of interferometry using femtosecond frequency comb and Fourier transformer;
- system for measuring long distances using modulator in the capacity of femtosecond laser;
- refractometry using helium;
- conception and realization of universal calibration of geodesic basis;
- stability of the geodesic monuments of global satellite systems;
- role of refractive index in the satellite laser distance measuring;
- two-laser distance meters for submicron absolute measurements of distances in a space.

Taking into account long-term experience of the NSC “Institute of Metrology” on the developing of precision measuring instruments for long distances, workshop program had a special place for the report of the workers of the laboratory “Measurements of geometrical quantities” of the NSC “Institute of Metrology” V. Kupko, S. Kovshova, I. Lukina on the topic of development of reference interferometer for measurement of long distances and for report about the achievements of the institute in the field of distance measuring.

From 4 to 6 October, 2011 in Bern, Switzerland, there was held an international conference “MacroScale 2011” which was devoted to space-dimensional measurements in the macroscopic scale which was organized by the Federal office of metrology METAS, Switzerland, and by the Federal Physico-Technical Institute (PTB), Germany.

At the conference there were presented about 50 reports of the scientists of NMIs from 20 countries of Europe, America, Asia, and Africa. Subject matter of these reports concerned the following directions:

- interferometry, including interferometry of high resolution;
- coordinate metrology, including optical coordinate metrology;
- micro-coordinate metrology;
- metrology of angle measurement and shape measurement;
- calibration of measurement standards of length;
- measurement of surface structure ;
- technology on the basis of femtosecond lasers.

At the conference Ukraine was represented by the presentation of the report “Reference comparator for length measurement” of the workers V. Kupko,

V. Boroha and S. Kovshov of the laboratory “Measurements of geometrical quantities” of the NSC “Institute of Metrology”. The subject matter of the reports and discussions concerned actual issues of providing the uniformity and traceability of space-dimension measurements. There were considered methods, algorithms and methodology of conduction of measurements, the issues of determination and recording of measurement uncertainties, application of the measurement instruments and also there were discussed the results of international comparisons.

The participants of the conference had an opportunity to visit the laboratories of Swiss institute of metrology (METAS).

At large, the conference as a forum for scientists and specialists in the field of metrology contributed to sharing of experience and information about the up-to-date achievements of the leading NMIs of the world in the field of space-dimension measurements in macroscopic scale.

The proposition about the creation of two working groups within TC 1.5 in the direction of nanometrology and long lengths measurement is submitted for the consideration.

It’s proposed to assign P. Todua, the director of NICPV, as the head of the Working Group (WG) in the direction of nanometrology. It’s proposed to assign A. Kostrikov, a scientific associate of NSC “Institute of Metrology”, as the head of the WG on long lengths measurements.

The Technical Committee according to time limit of the work makes a proposition about holding the regular meeting in 2012-2013 in Germany on PTB, as it was proposed before on the meeting of TC in Astana, Kazakhstan.

Vladimir Kupko  
Chairperson of TC 1.5

## ANNUAL REPORT of Chairperson of TC 1.6 “Mass and Related Quantities”

### 1. General characteristic in the cooperation in the field of measurements of mass and related quantities

Activities on 6 projects were carried out in the field of mass and related quantities measurements in 2010-2011.

**COOMET M.M.K2 No. 258/RU/02** “Key comparisons in the field of kilogram multiples and submultiples”

Coordinator: VNIIM

Draft B was prepared. The participants of comparison have opportunity to represent their CMC-s to interregional review.

**COOMET M.H-K1; COOMET M.H-K2 No. 341/RU/05** “Key comparison of Brinell and Vickers hardness scales”

Coordinator: VNIIFTRI

The measurements have been completed. Draft A was prepared and approved on the 16<sup>th</sup> Meeting of TC 1.6.

**COOMET M.P-K14 No. 444/DE/08** “Key comparisons national standards in the range 100 Pa to 5 kPa of gauge pressure”

Coordinator: PTB

The measurements are completed. Draft A was prepared and approved on the 16<sup>th</sup> Meeting of TC 1.6.

**COOMET M.F-K1 No. 259/RU/02** “Key comparisons in the field of force measurements in the range 20 – 1000 kN”

Coordinator: VNIIM

The measurements are completed. Draft A was prepared and approved on the 16<sup>th</sup> Meeting of TC 1.6.

**No. 515/UA/11** “Bilateral comparisons of primary standard of force between PTB and Ukrmetrteststandard”

Coordinator: PTB

The measurements are completed. Draft A was prepared and approved on the 16<sup>th</sup> Meeting of TC 1.6.

**No. 528/KZ/11** “Pilot comparisons of submultiply and multiply units of kilogram”

Coordinator: KazInMetr

The measurements are in progress.

**No. 515/UA/11** “Supplementary bilateral comparisons of primary standard of unit of torque force”

Coordinator: PTB

The technical protocol is completed.

### 2. State of CMC in mass and related quantities measurements of COOMET NMIs

The following COOMET tables are published in KCDB:

- COOMET.M.1.2001 – Mass, Pressure, Force, Viscosity – Russia;
- COOMET.M.5.2005 – Pressure – Cuba;
- COOMET.M.4.2005 – Hardness – Russia;
- COOMET.M.11.2009 – Hardness – Kazakhstan. These CMCs are approved but remain grayed out;
- CMC.M.12.2009 – Mass–Ukraine;
- CMC.M.13.2009 – Viscosity – Belarus.

### **3. TC activity on the review of CMC tables of NMIs**

The state and results of TC 1.6 activity on the expertise of CMC tables are characterized in the following way:

- SIM.M.20.2011
- EURAMET.M.25.2011
- APMP.M.29.2011

### **4. Collaboration with international regional organizations**

As it has already been mentioned one of the main tasks of TC 1.6 was and still is the promotion of cooperation between NMIs in the field “Mass and related quantities” for the purpose of implementing the Arrangement on Mutual Recognition of national standards in COOMET member countries. For the purpose of operative solution of these tasks the experts of TC 1.6 will take part in the meeting of the Consultative Committee of the Working Group on pressure and hardness. The TC members regularly organize the activity of NMIs on the comparisons of national standards; take part in different international conferences and seminars related with measurements, calibration, estimation of measurement result uncertainty, quality control including:

- 1) Training seminar “Uncertainty of mass value”, Tbilisi, Georgia, October 2010;
- 2) Training seminar “Pilot comparisons of submultiply and multiply units of kilogram”, Astana, Kazakhstan, May 2011;
- 3) NMI’s Quality system peer review, Ukraine, May 2011, Russia, October 2011;
- 4) The meeting of TC EURAMET of hardness and pressure;
- 5) The IMEKO conference of TC 16 “Pressure and Vacuum”.

Irena Kolozinska  
Chairperson of TC 1.6

## ANNUAL REPORT of Chairperson of TC 1.7 “Photometry and Radiometry”

### 1. International comparisons

The main activity of the TC 1.7 is organizing and carrying out international comparisons of COOMET in the field of photometry and radiometry.

TC 1.7 has been carrying out 6 COOMET comparisons: one of them is a key comparison and others are supplementary comparisons. All of them are registered in KCDB; the last one was registered in 2011. All of the comparisons changed their status from “Planned COOMET comparison” to “Agreed COOMET comparison” in 2011. Four comparisons now are at the stage of “measurement in progress”, one is at the stage of Draft B and the last is at the stage of “TP preparation”

Summary of the comparisons is presented in the table below.

#### 1.1. Key comparison COOMET.PR-K3a, Luminous intensity

Throughout all 2011 measurements were carried out. Up to now the following participants have completed the measurements: BelGIM (Belarus), VNIIOFI (Russia) and IM (Ukraine). Now the lamps are at KazInMetr (Kazakhstan).

#### 1.2. Supplementary comparison COOMET.PR-S4, Laser power responsivity. Bilateral comparison between VNIIOFI (Russia) and PTB (Germany)

In 2011 the Draft A report was completed, agreed with the participant and forwarded to TC 1.7 for review. The review was done by B. Khlevnoy. It was suggested to make some corrections in presentation of results and estimation of uncertainty. The current status is Draft B. The final report is expected in 2012.

#### 1.3. Supplementary comparison COOMET.PR-S3, Refractive index

Throughout all 2011 measurements were carried out. Up to now all participants except KazInMetr (Kazakhstan) have completed the measurements.

#### 1.4. Supplementary comparison COOMET.PR-S2, Angle of rotation of plane of polarization

In 2011 three new participants joined the comparison: Schmidt+Haensch GmbH & Co (Germany), GUM (Poland) и INMETRO (Brazil). In 2011 the TP was finally approved and registered at KCDB. The present stage: measurements in progress.

1.5. Supplementary comparison COOMET.PR-S1 (Whiteness and Brightness) has been registered in the KCDB but technical protocol has not completed yet. At the last TC 1.7 meeting (April 2011) it was suggested cancellation of the comparison. However the most members of TC 1.7 disagreed with the suggestion. The Working Group WG-S1 was established for speeding up the process.

#### 1.6. Supplementary comparison COOMET.PR-S3, Regular spectral transmittance

In 2011 the following work was done: CCPR agreed registration of the comparison as supplementary one. The comparison was registered at KCDB. The TP was approved and published at KCDB. At present time the measurements are in progress.

### 2. Participation in international metrological events:

- International Conference TEMPERATURE (April 2011, Saint-Petersburg, Russia),
- 9<sup>th</sup> meeting of TC 1.7 (April 2011, Kharkov, Ukraine),
- 9th meeting of JCMS of COOMET,
- 21st meeting of COOMET Committee,
- International Conference NEWRAD (September 2011, USA),
- CCPR WG-KC meeting (September 2011, USA).

Boris Khlevnoy

Chairperson of TC 1.7



## Comparisons of COOMET TC 1.7 “Photometry and Radiometry”

COOMET project #	KCDB registration	Type	Subject	Participants	Status	Start of measurement	End of measurement
368/BY/06	COOMET.PR-K3.a	Key	<b>Luminous intensity</b> Tungsten lamps, 500 cd	BelGIM (Belarus) – Pilot VNIIOFI (Russia) SMU (Slovakia) IM (Ukraine) KazInMetr (Kazakhstan)	Measurements in progress	November 2010	March 2012
366/RU/06	COOMET.PR-S1	Supplementary	<b>Whiteness and Brightness</b> CIE whiteness and R457 brightness (in accordance with ISO 2469 and ISO 2470), geometry D/0, 70-130, dimensionless	VNIIOFI (Russia) – Pilot BelGIM (Belarus) Ukrmetrteststandart (Ukraine)	Preparation of Technical Protocol	?	?
439/RU/08	COOMET.PR-S2	Supplementary	<b>Angle of rotation of plane of polarization</b>	VNIIOFI (Russia) – Pilot PTB (Germany) Schmidt+Haensch GmbH & Co (Germany) GUM (Poland) Ukrmetrteststandart (Ukraine) INMETRO (Brazil)	Measurements in progress	2011	2012
438/RU/08	COOMET.PR-S3	Supplementary	<b>Refractive index</b>	VNIIOFI (Russia) – Pilot PTB (Germany) KazInMetr (Kazakhstan) Ukrmetrteststandart (Ukraine) AIST (Japan) INRiM (Italy)	Measurements in progress	September 2010	2012
461/RU/09	COOMET.PR-S4	Supplementary	<b>Laser power responsivity</b> Wavelengths: 0.532 $\mu\text{m}$ and 10.6 $\mu\text{m}$ , 1 W	VNIIOFI (Russia) – Pilot PTB (Germany)	Draft B	December 2009	April 2010
429/CU/08	COOMET.PR-S5	Supplementary	<b>Spectral regular transmittance</b> Wavelength range: 250 nm to 635 nm	INIMET (Cuba) – Pilot VNIIOFI (Russia) INMETRO (Brazil) IM (Ukraine)	Measurements in progress	July 2010	2012

## ANNUAL REPORT of Chairperson of TC 1.8 “Physical Chemistry”

### 1. General characteristics of the cooperation in the field of physical chemistry

COOMET TC 1.8 Members:

The TC 1.8 consists of the representatives from national metrological organizations of the COOMET member countries: Azerbaijan (AZSTANDART), Armenia (ZAO “NIM”), Belarus (BelGIM), Germany (PTB, BAM), Georgia (GeoStandMetrology), Kazakhstan (KazInMetr), Kyrgyzstan (NISM), KNDR (CIM), Cuba (INIMET), Lithuania (VMT), Moldova (INSM), Rumania (NIM), Russia (VNIIM, VNIIMS, VNIIFTRI, VNIIOFI, UNIIM), Slovakia (SMU), Uzbekistan (SE “CNS”), Ukraine (Ukrmetrteststandart).

In 2011 the work of COOMET TC 1.8 “Physical Chemistry” was carried out in the following directions:

- Organization and realization of the work on the preparation of the NMI CMC data of the COOMET Member States that have signed the MRA.
- Organization and realization of the internal review of CMC for COOMET NMIs and the interregional review of NMI CMCs for other regional metrological organizations.
- Planning and organizing of international comparisons and interlaboratory researches.
- Getting the TC 1.8 Members acquainted with the CCQM and COOMET documents aimed at the realization of the MRA.
- Promotion in rendering metrological services in the field of physical-chemical measurements.

### 2. TC work on COOMET projects

**VNIIM is the coordinator of**

**375/RU/06** Pilot comparisons “Determination of gene-modified objects in food”

Participants: VNIIM (Russia), Institute of Cytology of the Russian Academy of Sciences (Russia), BelGIM (Belarus), Ukrmetrteststandart (Ukraine)

The final report is prepared.

**362/RU/06** Pilot comparisons in the field of measuring the aqueous glucose standards

Participants: VNIIM (Russia), Ukrmetrteststandart (Ukraine) and BelGIM (Belarus)

Participants completed investigations of the aqueous glucose samples for comparison.

**483/RU/09 (COOMET.QM-S1)** Key comparison of primary standards of concentration of components in gas media – NO in Nitrogen (50 µmol/mol)

Participants: VNIIM (Russia), BelGIM (Belarus), Ukrmetrteststandart (Ukraine), FMI (Finland), SMU (Slovakia), INMETRO (Brazil)

The samples for comparison (gas mixtures in cylinders) are prepared.

**484/RU/09 (COOMET.QM-K76)** Key comparisons of primary standards of concentration of components in gas media – SO<sub>2</sub> in Nitrogen (100 µmol/mol)

Participants: VNIIM (Russia), BelGIM (Belarus), Ukrmetrteststandart (Ukraine), SMU (Slovakia)

The samples for comparison (gas mixtures in cylinders) are prepared.

**435/RU/08** Pilot comparisons in the field of aerosol particles mass concentration measurement

Participants: VNIIM, VNIIFTRI (Russia) and KazInMetr (Kazakhstan)

The draft A report of the comparison between VNIIM and KazInMetr is prepared.

**367/RU/06** Pilot comparisons in the field of blood elements studies

Participants: VNIIM (Russia), BelGIM (Belarus), NISM (Kyrgyzstan)

Participants completed investigations of the comparison samples on the blood base.

**VNIIM is the coordinator of****211/RU/06** Carrying out interlaboratory comparison on the determination of toxic microimpurities in vodkas

Participants: VNIIM (Russia), VNIIM (Russia), FGU "Uraltest" (Russia), BelGIM (Belarus), UkrNIISpirbioprod (Ukraine), NISM RM (Moldova)

The final report is prepared.

**479/RU/09** Supplementary comparisons in the field of moisture mass fraction measurements in cereal grain and cereal products

Participants: VNIIM (Russia), BelGIM (Belarus), Ukrmetrteststandart (Ukraine) and others

Project's state is proposed.

**520/RU/10** Pilot comparisons in the field of hydrogen ions concentration measurements in hydrochloric acid solutions (mol/kg)

Project's state is proposed.

**508/RU/10** Pilot comparisons in the field of nitrogen mass fraction measurements in milk food

The project's state is proposed.

**Ukrmetrteststandart is the coordinator of****540/UA-a/11 (COOMET.QM-K36)** Key comparison Electrical conductivity 0.5 Sm/m

Participants: Ukrmetrteststandart (Ukraine), BelGIM (Belarus), GEOSTM (Georgia), KazInMetr (Kazakhstan), INDECOPI (Peru), SMU (Slovakia), VNIIM (Russia), VNIIFTRI (Russia)

Project is agreed.

**3. Results of the last meeting of TC 1.8**

The last meeting of TC 1.8 "Physical Chemistry" was held in VNIIM in May 25-26, 2011.

The representatives from Russia (VNIIM, VNIIFTRI, VNIIOFI), Kyrgyzstan (NISM), Belarus (BelGIM), Ukraine (Ukrmetrteststandard), Kazakhstan (KasInMetr), Moldova (INSM).

The meeting decisions were included into the Protocol.

**4. Review of the projects completed**

Two COOMET projects were completed in 2011:

- 375/RU/06;
- 211/RU/06.

**5. Cooperation with international and regional organizations**

Participation of the representatives of TC 1.8 "Physical Chemistry" was organized in the following events:

**CCQM:**

- the 17th meeting of the CCQM – 1 specialist from VNIIM (Paris, April, 2011);
- meetings of the Working Groups of the CCQM – 5 specialists of VNIIM:
  - on Key Comparisons and CMC Quality (KCWG) (Paris, April 2011),
  - on Gas Analysis (Paris, April 2011),

on Organic Analysis (Paris, April 2011),  
 on Inorganic Analysis (Paris, April 2011),  
 on Bioanalysis (Paris, April 2011, Mexico, October 2011);

- CCQM workshop on role for the reliable traceable microbiological measurements to ensure food quality and safety (Paris, April 2011);

#### **VAMAS:**

- meeting of the steering committee – 1 specialist of VNIIM (Rio de Janeiro, May 2011).

### **6. Activities for implementation of CIPM MRA**

#### **6.1. Organization and realization of work on preparation of CMC**

**6.1.1.** The CCQM review of cycle XI “non fast track” and cycle XII CMCs was completed; the results were published in Appendix C (MRA) of BIPM database.

There were published within these 2 cycles

by VNIIM

in Gas Analysis – 24 CMCs (44 lines), which include 14 new CMCs (34 new lines) and 10 revised CMCs (lines);

in Inorganic Analysis – 15 new CMCs (lines), 13 revised CMCs (lines), 3 CMCs (lines) deleted;

in Electrochemical Analysis – 1 revised CMC (line);

by UNIIM

in Inorganic Analysis – 1 new CMC (line);

by VNIIFTRI

in Electrochemical Analysis - 5 revised CMCs (lines); 2 CMCs (lines) deleted;

by BelgIM

in Gas Analysis – 1 new CMC (6 lines);

in Electrochemical Analysis – 1 revised CMC (line);

by Ukrmetrteststandart

in Gas Analysis – 3 new CMCs (9 lines);

in Electrochemical Analysis – 3 new CMCs (lines), 6 revised CMCs (lines).

**6.1.2.** At present, the International CMC Database (Appendix C) contains 436 lines of VNIIM, 9 lines of UNIIM, 5 lines of VNIIFTRI, 21 lines of Ukrmetrteststandard, 11 lines of BelgIM.

Distribution of the COOMET CMCs according to measurement categories is the following: Gas Analysis – 383 lines, Organic Solutions – 25 lines, Inorganic Solutions – 15 lines, Metals – 14 lines, Sediments, Soils, Ores and Particles – 9 lines, High Purity Chemicals – 10 lines, Food – 5 lines, Water – 1 line, Electrochemical Analysis – 16 lines, Advanced Materials – 4 lines.

#### **6.2. Participation in international comparisons and interlaboratory studies**

Planning and organization of participation of the active COOMET member states in the international (key and pilot) comparisons are provided.

CCQM, EUROMET, APMP and SIM comparisons:

<b>Comparison</b>	<b>COOMET NMI</b>	<b>Status</b>
CCQM-K66 Purity analysis of Methane	VNIIM (Russia)	Draft B
CCQM-K68 Nitrous Oxide at ambient level	VNIIM (Russia)	Final report
CCQM-K74 Nitrogen Dioxide in Nitrogen at 10 µmol/mol	VNIIM (Russia)	Draft B
CCQM-K76 Sulfur Dioxide in Nitrogen at 10 µmol/mol	VNIIM (Russia)	Draft B

Comparison	COOMET NMI	Status
CCQM-K77 Synthetic Refinery Gas	VNIIM (Russia)	Draft A
CCQM-K93 Ethanol in nitrogen	VNIIM (Russia)	The research is completed
CCQM-P102 Quantification of cells with specific phenotypic characteristics	VNIIM (Russia)	Draft A
CCQM-P103 Measurement of multiplexed biomarker panel of RNA transcripts	VNIIM (Russia)	Final report
CCQM-P94.1 Quantification of DNA methylation	VNIIM (Russia)	Draft A
CCQM-K86 Relative Quantification of Genomic DNA Fragments Extracted from a Biological Tissue	VNIIM (Russia)	Draft B
CCQM-K79 Value-assignment of CRMs and Proficiency Testing Materials for Ethanol in Aqueous Matrix	VNIIM (Russia)	Draft B
CCQM-K55.b Purity assessment of high purity organic materials: Aldrin	VNIIM (Russia)	Draft B
CCQM-P100.3 Mercury in natural water	VNIIM (Russia)	Final report
CCQM-K87 Monoelemental calibration solutions	VNIIM (Russia)	Draft A
CCQM-K88 Pb in lead-free solder	VNIIM (Russia)	Draft B
CCQM-K95 Mid-Polarity Pesticides in Tea	VNIIM (Russia)	The sample is delivered
CCQM-K89 Trace and essential elements in Herba Ecliptae	VNIIM (Russia)	The research is completed
CCQM-P128 Pb, As and Hg in a cosmetic material	VNIIM (Russia)	The research is completed
CCQM-K92 Electrolytical conductivity (20 and 0.05 S/m)	Ukrmetrteststandart (Ukraine) VNIIFTRI (Russia) VNIIM (Russia)	Draft A
APMP.QM-K41 Hydrogen Sulfide in Nitrogen	VNIIM (Russia)	Draft B
APMP.QM-P14 Pesticides in carry-paste	VNIIM (Russia)	Final report
APMP.QM-P19 Melamin in milk powder	VNIIM (Russia)	Draft A
SIM.QM-S2 Metals in drinking water	VNIIM (Russia)	Draft A

## 7. Information on the prospective place and date of the next meeting

The next meeting of TC 1.8 “Physical Chemistry” will be held in Saint-Petersburg, VNIIM. The date of the meeting will be specified later.

Prof. Leonid Konopelko  
Chairperson of TC 1.8

## ANNUAL REPORT of Chairperson of TC 1.9 “Ionizing Radiation and Radioactivity”

### 1. CMC review

Review of CMCs has been made in framework of the project 175/RU/99 “Status of a measurement standard base in the field of ionizing radiation and radioactivity for the member countries of COOMET” (S. Korostin, VNIIFTRI, MenCSM).

The next CMCs published in the KCDB BIPM:

- NSC IM (Ukraine, Rn-222 activity, 2 entries) COOMET.RI.8.2010
- CENTIS-DMR (Cuba, radioactivity, 25 позиций) COOMET.RI.9.2011 .

### 2. Project fulfillment

- **445/DE/08 COOMET.RI(I)- S1** Comparison of the national standards of air kerma for Cs-137 at protection level (L. Buermann, PTB)

Participants: VNIIM, CPHR, BelGIM, NSC IM, PTB, GEOSTM, NISM.

The training workshop was made on 24-26 May. The measurements were started in summer 2011.

- The comparison should be started in 2011. The transfer standards should be obtained by PTB

The projects which status should be specified:

- **410/UA/07** COOMET regional comparisons of national standards of Co-60 gamma-radiation absorbed dose to water (Coordinator: NSC IM, Ukraine)

Suggested participants: VNIIFTRI, CPHR, BelGIM, NSC IM, PTB

- **446/DE/08, 447/DE/08** Comparison of the national standards of air kerma for low- and medium energy x-rays (L. Buermann, PTB)
- **462/RU/09** Comparison of the calibration factors neutron response/fluence for the standard neutron sources: Am-Be, Cf-252, Cf-252 in the sphere Ø 30 cm filled with D<sub>2</sub>O” (N.Moiseev, VNIIM)

### 3. TC 1.9 meeting

In 2012 the meeting is scheduled in VNIIFTRI (Russia).

In 2013 the meeting is scheduled in AZSTANDARD (Azerbaijan).

Prof. Vladimir Yarina  
TC 1.9 Chairperson

## ANNUAL REPORT of Chairperson of TC 1.10 “Thermometry and Thermal Physics”

### 1. Execution of the work in the subject area of TC 1.10 “Thermometry and Thermal Physics”

The activity of the COOMET NMIs in the field of temperature and thermophysical quantities measurements were focused on implementation of the decisions taken by TC 1.10 at its meeting in October 2010. This activity was mainly concentrated on organization and realization of regional comparisons aimed at supporting the measurement capabilities (CMCs) of the NMIs.

1. The results obtained from the realization of COOMET **Project 417/UA-a/08** “Supplementary comparison of national measurement standards of the temperature unit in the melting point of gallium, freezing points of indium, tin and zinc” have ensured the international recognition of the measurement capabilities claimed by NNC “Institute of Metrology” in the field of thermometry by including 27 CMCs in the KCDB maintained by the BIPM.

2. The purpose of setting **Project 395/BY/07** “Key comparison of the water triple point cells of the national temperature unit standards” was also to support the measurement capabilities of the NMIs of COOMET. BelGIM was designated to be the pilot of the comparison. At present the cells have been compared once again and the project is close to completion.

3. **Project 387/UA/07** “Comparison of national temperature standards in the freezing points of silver, gold and copper is also close to completion. As per decision taken at the previous meeting of TC 1.10 about realizing a comparison of crucibles with copper in addition to the already realized comparison of temperature lamps calibrated at the freezing point of copper, a crucible with copper belonging to the “Institute of Metrology” was delivered to VNIIM. The comparison of crucible has already started and it is expected that the first draft of the comparison report should be prepared in 2012.

4. The work on **Project 228/UA-a/01** (Comparison of national standards of the combustion heat unit) was completed. The results were reported at the WG 9 meeting (May 2010) and the International Symposium on reference materials in Beijing (RM 2010-Beijing International symposium on reference materials 2010.10.26-29 p 73-75). The Draft B Report was sent to the Secretariat of COOMET. The Project Completion Registration Card has not been made up.

The following four NMIs took part in the comparison: D.I. Mendeleyev Institute of Metrology (VNIIM, Russia), NNC “Institute of Metrology (Ukraine), Chemical Metrology Analytical Science Division (NIM, PRC) and BRML-National Institute of Metrology (Romania).

5. A new **Project COOMET 504/RU/10** “Regional comparison of national temperature standards in the mercury triple point” was registered. The pilot laboratory is VNIIFTRI. The work under this project is going very slowly, there is almost no any noticeable progress.

6. **Project 495/RU/10** “Pilot comparison in the field of thermal conductivity measurements in the range from 0.03 to 0.05 W/(m.K) in the temperature range from 10 to 40 °C”.

Only two NMIs were able to take part in this comparison: VNIIM (Russia) and KazInMetr (Kazakhstan). Thermal conductivity was measured by means of standard setups composing the national primary standards and meeting the requirements of International Standard ISO 8302 and its national equivalent GOST 7076-99 (harmonized with ISO).

For the realization of the unit the heat insulating material PENOPLEX was used. The comparison program was conceived to take into account the peculiar features of the measurement instruments used in the comparison (geometry of the samples, temperature and thermal conductivity ranges).

It was proposed to the participants to carry out four consecutive measurements of heat conductivity at the temperature of 25 °C to estimate the reproducibility of measurement results obtained in each laboratory, and to make three separate measurements at 0 °C, 10 °C

and 40 °C. The pilot laboratory (VNIIM) checked the stability of the samples at the beginning and at the end of the comparison.

The final processing and analysis of the comparison results were made. The maximum discrepancy in the measurement results obtained in KazInMetr and VNIIM does not exceed one per cent. The work was completed and the results were reported at the International Conference "Temperature-2011". The corresponding article was prepared for publication in the journal "Measurement Techniques".

7. New **Project 486/RU/10** was registered: "Regional comparison of copper cells for contact thermometry". At present the technical protocol of the comparison has been drawn up.

8. New **Project 487/RU/10** "Regional comparison of S-type thermocouples in the temperature range from 300 to 1100 °C. At present the technical protocol of the comparison has been drawn up and sent for approval to the participants.

9. **Project 488/RU/10** "Regional comparison of national standards of the combustion energy using samples of gas mixtures.

The proposal of Russia about organization of a comparison in the field of gas calorimetry was approved by the NSC "Institute of Metrology" (Ukraine).

Russia is totally ready to conduct this comparison using her new measurement system of the State primary standard of the combustion energy units, specific combustion energy and volume combustion energy (GET 16-2010) including 2 gas calorimeters and realizing different methods.

It turned out later that Ukraine is unable to participate in this comparison in 2011 because her national standard required modernization. However, her participation in the comparison was confirmed. Therefore the pilot laboratory suggested extending the number of participants by including Belarus where measurements of the combustion energy could be conducted by an indirect method using the gas chromatography analysis on the national standard.

This information about the new participant was sent to Ukraine, but no reply has been received to date. In the meantime, the pilot laboratory has developed a draft technical protocol and chosen the object of comparison: simulated natural gas. Accordingly, the corresponding purchase order for special aluminum cylinders was made, as well as the order for preparation of the gas mixture whose composition was proposed by the pilot laboratory. The comparison schedule was prepared which includes the following steps: acquisition and preparation of cylinders, preparation of the gas mixture in the cylinders, transportation of a cylinder to the first participant, measurements and statistical processing of the results.

10. **Project 489/RU/10** "Regional comparison of national measurement standards of combustion energy using high purity graphite"

Participants: VNIIM (Russia), NSC "Institute of Metrology" (Ukraine), NIM (China) (Chemical Metrology Analytical Science Division).

The time schedule in the technical protocol was corrected upon receipt of the information from China about a malfunction of the measuring system of their standard and the ensuing necessity to postpone the measurements and the information from Ukraine that their participant was not able to meet the deadline, either. The Project form with the "approved" status was sent to the Secretariat of COOMET.

VNIIM and NIM have started calorimetric experiments on burning the comparison sample of Gr-R1 (high purity graphite).

The report on the completed comparison of benzoic acid samples was sent to Dr. Baba, Chair of WG9 CCT for further circulation among the WG members for comments and suggestions regarding the status of the comparison. It was suggested to recognize this comparison as supplementary and to qualify the new comparison of high purity graphite samples as a key comparison. This issue was discussed during the meeting of the working group on Aug. 28, 2011 in Saliniki.



11. The **Project 494/RU/10** “Supplementary regional comparison of national standards of temperature unit in the range from the triple point of water to the freezing point of zinc” is carried out with a large delay because of difficulties in transportation of the portable standard resistance thermometer. Measurements in the Georgian National Agency on Standards, Technical Regulation and Metrology (GNA) was completed. The thermometer was returned to VNIIM, where its check calibration was performed. In April, 2011, the thermometer was delivered to the National Institute of Standardization and Metrology, where its calibration is now being completed.

12. The **Project 494/RU/10** “The 4<sup>th</sup> All-Russia and COOMET Countries Conference on Temperature Measurements TEMPERATURE 2011” was successfully completed and closed. The Conference took place in St. Petersburg in the period from 19 to 21 of April, 2011.

## **2. Results of the last meeting of TC 1.10**

A regular meeting of the Technical Committee “Thermometry and Thermal Physics@ TC 1.10 COOMET took place on 21-22 September, 2011, in the Belorussian Institute of Metrology.

Representatives of 7 countries participated in the meeting: Belarus (BelGim, Gosstandart of Belarus, OOO “POINT”), Russia (VNIIM, VNIIFTRI, OAO NPP “Etalon”), Kazakhstan (KazInMetr), Moldova (NISM), Kyrgyzstan (CSM MERKR), Ukraine (NNC “Institute of Metrology”) and Slovakia (SMU).

### **Participants:**

#### **Belarus:**

Dr. Nikolay A. Zhagora, Director of BelGim, Vice-President of COOMET;

Serguey N. Nefedov, Head of Metrology Department of Gosstandart;

Vladimir P. Lobko, 1<sup>st</sup> Deputy Director of BelGim;

Piotr V. Krivonos, Head of Temperature and Thermophysical Measurements Dept. of BelGim;

Tamara I. Dikun, Deputy Head of Temperature and Thermophysical Measurements Dept. of BelGim;

Nikolay V. Bakovets, Head of Physico-Chemical and Optical Measurements Dept. of BelGim;

Elena A. Zolotorevich, Leading Engineer of Physico-Chemical and Optical Measurements Dept. of BelGim;

Pavel V. Kozlov, Leading Engineer of Temperature and Thermophysical Measurements Dept. of BelGim;

Vyacheslav V. Gergalov, 1<sup>st</sup> Cat. Engineer of Physico-Chemical and Optical Measurements Dept. of BelGim;

Nadezhda D. Lyakhova, Secretary of Belarus in COOMET;

Vatslav S. Guivoino, Director of OOO “POINT”.

#### **Kazakhstan:**

Kuralay K. Duysebaeva, Leading Expert, KazInMetr;

Alia G. Kalieva, Leading Expert, KazInMetr;

Baurzhan, Zh. Mukhamedjanov, Leading Expert, KazInMetr.

#### **Kyrgyzstan:**

Tamara V. Savina, 1<sup>st</sup> Cat. Engineer, Laboratory of Temperature Standards of the Standardization and Metrology Centre with Ministry of Economic Regulation of Kyrgyzstan (CSM MERKR).

#### **Moldova:**

Konstantin I. Bordianu, Head of Temperature Measurements Laboratory, NISM.

#### **Russia:**

Anatoly I. Pokhodun, Deputy Director, Head of Thermodynamics Dept. of VNIIM;

Nikolay A. Sokolov, Head of Section, VNIIM;

Pavel Yu. Znatkov, Head of Thermometry and Thermal Physics Laboratory, VNIIFTRI;  
Olga A. Podmurnaya, Senior Scientific Staff Specialist, East-Siberian Branch of VNIIFTRI;  
Vladimir A. Nikonenko, Director General of OAO NPP “Etalon”.

**Slovakia:**

Stanislav Duris, Deputy Head of Thermometry, Photometry and Radiometry Centre, SMU.

**Ukraine:**

Rimma P. Serguienko, Senior Scientific Staff Specialist, Thermometry and Thermophysical Measurements Laboratory, NNC “Institute of Metrology”.

The following issues were discussed during the meeting:

- main results of the previous meeting of the CCT and its WG-8;
- organization of the next circle of key comparison in thermometry;
- current status of the work in COOMET Projects in the field of Thermometry and Thermal Physics;
- proposals for new Projects under cooperation in the field of temperature and thermophysical quantities measurements;
- current status of the work in the field of humidity measurements;
- current status of measurement capabilities of national metrology institutes of COOMET published in the KCDB;
- status of production of instruments measuring temperature and thermophysical quantities at enterprises of the COOMET countries.
- time and venue of the next meeting of TC 1.10.

**3. Review of the completed projects**

Project 517/RU-a/11 “The 4<sup>th</sup> All-Russia and COOMET Countries Conference on Temperature Measurements “TEMPERATURE 2011” was successfully completed.

**4. Interaction with international and regional organizations**

Institutes of other regional metrology organization are got actively involved in the work planned by TC1.10. In particular, the NIM of China, an APMP member, participates in Project 228/UA-a/01, as well as the NMI of Rumania, a member of EURAMET.

In its turn, VNIIM takes part in projects of EAURAMET. In particular, in the framework of the iMERA project aimed at improving the temperature scale and its realization VNIIM took part in the study of carbon-rhenium and rhenium-carbon eutectic alloys interfaces.

VNIIM is actively participating in the work of the CCT and its 6 working groups. As a result of the principled stand taken by VNIIM regarding the redefinition of the temperature unit was adopted Recommendation 2 of the CCT with the proposal to the CIPM to put off the decision about the redefinition of the Kelvin till 2015.

TC 1.10 has actively participated in the work of Working Group 8 (WG8) of the CCT.

**5. Participation in the realization of international agreements**

Institutes of COOMET have been actively participation in the realization of the MRA. In particular, the COOMET Institutes review the measurement capabilities declared by Institutes of other RMOs and participate in regional key comparisons in accordance with the Arrangement with the purpose of supporting their own measurement capabilities.

**6. Information about the next date and venue of TC 1.10 meeting**

The next meeting of TC 1.10 will be held from 30 to 31 of October, 2012 in the city of Almaty in the South-Kazakhstan Branch of KazInMetr.

Dr., Prof. A. I. Pokhodun  
Chairperson of TC 1.10

## ANNUAL REPORT of Chairperson of TC 1.11 “Time and Frequency”

### 1. The general characteristic of the work

For the period elapsed the work on 5 themes was carried out on the subject “Time and Frequency”. They are:

- 12/RU-a/92** ERP determination on the basis of the data from the observatories of COOMET countries (permanent metrology work);
- 15/RU-a/92** Intercomparisons of the National time scales (permanent metrology work);
- 17/RU-a/92** Research into the primary caesium frequency standards (permanent metrology work);
- 174/RU-99** The state of affairs in time and frequency standards of the COOMET members;
- COOMET.TF-K001.UTC** Comparison of National standards for time and frequency using National time scale of Russia (pilot project).

In 2011 a special meeting of COOMET Technical Committee TC 1.11 “Time and Frequency” was not to be held.

### 2. The CMC review

2 reviews of CMCs have been made in 2011. The inter-regional reviewing for Kazakhstan is completely finished, for Ukraine (latest version) – is going to the final stage of consideration.

### 3. Review on the fulfilled work

- 2/RU-a/92** ERP determination on the basis of data from observatories of COOMET countries (permanent metrology work)

Similarly with previous years, in 2011 the observatories in Russia, Ukraine, Uzbekistan, Bulgaria, Poland, Czech Republic continued to make routine star and satellite observations and then transmitted the observation data to the ERP processing and calculating centre at FGUP “VNIIFTRI”. An exchange of ERP observing data and calculating results was made between the countries-participants and the International and National Centers for ERP determination. The calculations of the pole coordinates and duration of the day by the results of GPS observations at the stations on the territory of Russia were made on a regular basis. The accuracy of ERP determination by means of all the techniques of the countries-participants was about 0.0002” and 0.02 ms with regard to the pole coordinates and to the Universal Time, correspondingly (completely analogy to 2010). These values closely approach to the accuracy of products of the International Earth Rotation Service (IERS).

- 15/RU-a/92** Intercomparison of the National Time Scales (permanent metrology work)

Comparisons of the UTC(SU) – Russia with the UTC(BY) – Belarus, UTC(GUM) – Poland and UTC(UA) – Ukraine, and UTC (KZ) – Kazakhstan were made in 2011. A mutual exchange of measuring data was performed.

To perform intercomparisons the specialists of FGUP “VNIIFTRI” used the following receivers: multi-channel receivers GPS/LONASS TTS-3 after calibration procedure [1] using BIPM etalon-GPS receiver.

The comparisons between UTC(SU) and UTC(BY) were made using GPS common-views method (daily average data in the CGGTTS.V2 format). The multi-channel receiver GPS/LONASS 001 06 is used for that purpose.

Comparisons between UTC(SU) and UTC(GUM) were performed by using the GPS common-views receiver (in the CGGTTS.V2 format). An 8-channel TTS-2 receiver is used in GUM.

Comparisons of UTC(SU) with UTC(UA) were made by GPS common-views (daily average data (in the CGGTTS.V2 format). The specialized multi-channel receiver GPS/GLONASS/GALILEO TTS-4 is used at GNPO “Metrologia”.

The comparisons between UTC(SU) and UTC(KZ) were made under GPS common-views (daily average data in the CGGTTS.V2 format). The multi-channel receiver GPS/LONASS TTS-3 is used in KazInMetr Centre.

Figure 1 below demonstrates an interposition of time scales of the COOMET-Laboratories in 2011 with regard to the International UTC time scale obtained by GPS signal comparisons.



Fig. 1. An interposition of time scales of the COOMET-laboratories in 2011 with regard to the international UTC time scale obtained by GPS signal comparisons.

Table 1 below shows a status of time scales and frequency units for the COOMET participants with regard to the UTC scale, performed corrections and also an information of the time links used.

Table 1. Information about values of units of the time

	BY	KZ	PL	SU	UA
Time scale difference UTC - UTC(i) (ns) for 29.12.2011, MJD = 55924	51.3	-150.7	-3.1	-1.5	2.4
Normalized frequency difference $\Delta f/f[\text{UTC} - \text{UTC}(i)]$ (in units $\times 10^{-14}$ )	0.79 <sup>1</sup>	-0.48	0.01	0.02	0.33
Type A uncertainty of time comparison <sup>2</sup> (ns)	$\leq 7.3$	$\leq 5.5$	$\leq 5.3$	$\leq 5.3$	$\leq 20.1$
Time comparison links	GPS	GPS	GPS	GPS/GLO	GPS

<sup>1</sup> In the calculations 3 corrections for the time scale were used at MJD=55629, 55714 and 55804.

<sup>2</sup> Using data published in circular T BIPM.

Up to now, no measuring data from time services of Bulgaria and Slovakia was not received.

[1] W. Lewandowski and L. Tisserand, Relative characterization of GNSS receiver delays for GPS and GLONASS C/A codes in the L1 frequency band at the OP, SU, PTB and AOS, Rapport BIPM-2010/04, BUREAU INTERNATIONAL DES POIDS ET MESURES, 2010, Pavillon de Breteuil, F-92312 SEVRES Cedex.

### **COOMET.TF-K001.UTC** Comparison of National standards for time and frequency using National time scale of Russia (pilot project)

During period under review (2011) the work on the finishing of pilot project was continued. A comparison apparatus for the work 15/RU-a/92 is used.

In 2012 we plan to finish the pilot-stage of this project and to start the permanent metrological work for that key-comparison.

### **17/RU-a/92** Research into the Primary Caesium Standards

In 2011 at “VNIIFTRI” (Russia) as in the previous years the work on the primary frequency standards was carried out in two basic lines: effective maintenance of the primary caesium frequency standard on thermal atoms MCS -102 and development of a caesium fountain standard.

The stated type B uncertainty for the MCS 102 is estimated to be  $3.0 \times 10^{-14}$  as in the previous year. In this estimation we taken into account an inhomogeneous of C-field, uncertainties of electronics, microwave leakage, Rabi and Ramsey pulling, microwave spectrum, etc. As a result, an RMS normalized frequency deviation for month overlapped intervals from the mean one per year was  $(0.7 \pm 0.9) \times 10^{-14}$ .

As in the previous year the relative differences for unit of frequency for the best cesium standards are not exceeded the two units of  $1 \times 10^{-14}$ . The relative differences for unit of frequency averaged (per month) for two years period of observations (2010 and 2011) for PTB Cs1, PTB Cs2, MLI102 cesium standards are also not exceeded the two units of  $1 \times 10^{-14}$ .

### **174/RU-99** The state of affairs in time and frequency standards of the COOMET members

No information on the changes in an apparatus structure of standard facilities has been received from the majority of the participating countries.

### **TC recommendation for future activity**

TC Meeting (April 2008, Minsk, Republic of Belarus) recommended to start new projects: “Comparison for time and frequency domain” (In the final stage of progress, Suggested coordinator – VNIIFTRI).

## **4. Collaboration with international and regional organizations**

- Bureau Internationale on Poids et Mesures (**BIPM**), regular data exchange to contribute to the TAI;
- Comité Consultatif du Temps et des Fréquences (**CCTF**), participation in the work of the CCTF and its Working Groups;
- Consultative Committee on Length (**CCL**), participation in elaboration of recommendations on redefinition of a second;
- International Telecommunication Union (**ITU**), participation in the work of 7A Group;
- International Earth Rotation Service (**IERS**), regular data exchange;
- International Geodetic Service (**IGS**), observation and processed data exchange;
- International Laser Ranging Service (**ILRS**), observation and processed data exchange.

Participation of FGUP VNIIFTRI on International Conferences and Forums in 2011:

- European Forum on Time and Frequency (May 2011, San Francisco, USA);
- International Meeting on research of VLBI (October 2011, Beijing, China);
- International Conference on Precise Time and Time Intervals (November 2011, Los Angeles, USA).

Prof. Vitaliy Palchikov  
Chairperson of TC 1.11

## ANNUAL REPORT of Chairperson of TC 1.12 “Reference Materials”

### 1. General characteristic of cooperation in this subject field

Over the period under review in COOMET subject field “Certified Reference Materials” the work was carried out on 25 projects.

The project coordinators are the experts from Belarus (1 project), Kazakhstan (1 project), Russia (20 projects), Ukraine (2 projects) and one project Armenia - Russia; the experts of metrological centres and applied-research laboratories from Belarus, Germany, Kazakhstan, Kyrgyzstan, Moldova, Russia and Ukraine are involved in CRM certification analyses and experimental works on comparisons.

The list of the projects is given in Appendix 1. Among them 16 are Agreed Projects and 9 are Proposed Projects.

Cooperation within TC 1.12 “CRMs” is aimed at the production of COOMET CRMs, which, under their status, may be used in the countries that joined their recognition without any additional admission procedures. This possibility is achieved by carrying out mandatory experimental works with participation of laboratories from COOMET member countries.

Depending on the method, used to produce COOMET certified reference materials (COOMET Recommendation R/RM/4:2008, sub-clause 3.4), experimental works include the participation in:

- certification analyses in the course of CRM development or additional certification;
- certification analyses to confirm the values of CRM certified characteristics;
- comparisons of CRMs of different status.

In 2011 this work was carried out on 19 projects out of the total number of the projects.

Normative documents were developed within 3 projects. Two of them are finalized, the works on the project 498/RU/10 “COOMET Recommendation. The content and procedure of works on CRM comparison within COOMET” are underway.

Within the on-going project 186/RU/99 “The Programme of CRM joint production within COOMET” the annual updating was completed; the scope of work on the project 522/RU/11 was the organizing and conducting the 16<sup>th</sup> meeting of TC 1.12 “CRMs”.

During the current year the cooperation on 5 projects was successfully finalized. Among them 4 projects were on the development of COOMET CRMs, covering 7 CRM types, recognized as COOMET CRMs at the 21<sup>st</sup> COOMET Committee meeting (April, 2011). At the same meeting the revised COOMET Recommendation R/RM/17:2007 “Guidelines for issuing Certificate of the participant of experimental works on the development of COOMET certified reference materials” was approved.

The forms of final reports for all finalized projects were prepared and submitted to COOMET Secretariat; detailed information on finalized projects is given in sections 2 and 3 of this report.

The works on 3 projects are at the final stage and on the 12 projects are underway. The information on the results of the finalized and on the progress of the ongoing projects was prepared and considered at the 9<sup>th</sup> JCMS meeting, the 21<sup>st</sup> COOMET Committee meeting (April 2011) and at the 16<sup>th</sup> TC 1.12 “CRMs” meeting (October, 2011).

The 16<sup>th</sup> meeting of TC 1.12 “CRMs” (Kharkov, October, 2011) was held, the relevant information is given in section 2 of this report. The agreed results of the finalized projects are to be submitted to the 22<sup>nd</sup> COOMET Committee meeting in compliance with operating procedure.

During the year under review 7 COOMET CRM types were entered in the Register of COOMET CRMs. At present the Register of COOMET CRMs holds the information on 104 COOMET CRM types; accordingly the information on 104 COOMET CRM types was entered in the Data Bank of COOMET CRMs.

The works on stuffing the page of TC 1.12 “CRMs” of a new COOMET web-portal were carried out (address: [www.coomet.net](http://www.coomet.net)).

To encourage laboratories, participating in CRM interlaboratory certification, the Secretariat of TC 1.12 “CRMs” prepared and forwarded to the addressees the Certificates of participation in the finalized projects in Russian and in English.

## **2. The results of the last meeting of Contact Persons and Project Coordinators**

The regular 16<sup>th</sup> meeting of TC 1.12 “Certified Reference Materials” (project 522/RU/11) was held in Kharkov (October 2011). The representatives of Armenia, Belarus, Germany, Kazakhstan, Russia and Ukraine – Contact-Persons, Project Coordinators and the experts from different branches of national economies of COOMET member countries, participating in the development of specific types of certified reference materials, and the representative of TC 1.8 “Physical Chemistry” took part in the work of the meeting.

*At the meeting the decisions were taken to prepare and submit to the 22<sup>nd</sup> COOMET Committee meeting the documentation on a CRM for composition of soil and two sets of CRMs for composition of copper and copper oxide for the recognition as COOMET CRMs (finalized projects 503/RU/10, 474/RU/09 and 502/RU/10).*

The developed CRMs for composition of soil allow the control over the reliability of elemental analysis of environmental objects during the monitoring of the environment and various ecological studies.

The relevance of the development of CRMs for composition of copper and copper oxide is due to the increased demands to the quality of copper, the need to comply with the requirements of interstate standards and the lack in the market of CRMs for composition of copper with low content of impurities for quality control of both real products, released by enterprises and research products, manufactured using modern nanotechnologies.

*Among the normative documents at the meeting were considered:*

- the report on the results of the development of the List of CRMs subject to transportation for the purposes of metrological certification, exempted from customs duties, taxes and granting special permissions according to Articles 1-3 of the Agreement of 10 February 1995 (project 451/KZ/09);
- COOMET 1<sup>st</sup> draft Recommendation “The content and procedure of works on CRM comparison within COOMET” (project 498/RU/09).

The project 451/KZ/09 was initiated due to the need to specify the provisions of the Agreement of 10 February 1995 as concerns the duty-free transportation of CRM material for conducting various studies (certification, comparison, confirmation of certified values, etc.) in compliance with customs regulations for classification of substances and materials.

The establishment of the Customs Union between Russia, Belarus and Kazakhstan and the introduction of new regulations for export and import of goods for union members was the reason to revise the initial conditions for realization of the project. Having discussed the report the meeting took a decision to finalize the work at this stage.

The 1<sup>st</sup> draft Recommendation, presented within the project 498/RU/09, was subjected to active and comprehensive discussion, since it is of a considerable and practical interest for carrying out the works on CRM comparison to justify the demonstration of measurement capabilities, based on CRM metrological characteristics in Appendix C CIPM MRA and also for the demonstration of the possibility to recognize CRMs as COOMET CRMs.

The complexity of the problems, covered by this Recommendation, did not allow the agreement upon the 1<sup>st</sup> draft at the meeting. From the results of a general discussion it was decided to refine the 1<sup>st</sup> draft based on the discussion at the meeting and further consideration by the Working Group, set up for the development of the Recommendation.

On 12 projects in progress the information of the Project Coordinators was provided, the Programmes of Work were agreed upon and CRM samples for analyses were exchanged.

The consideration of the updated “Programme of joint CRM production within COOMET” (the on-going project 186/RU/99) as of October 2011 made it possible to start the works on 2

new projects and once again confirmed its significance as the source of preparing new proposals for initiating new projects on the development of new COOMET CRMs.

At the meeting the information capabilities of COOMET web-portal (TC 1.12 page), the progress of the COOMET CRM Register and Data Base were considered.

From the results of the meeting the minutes were drawn up, translated into English and submitted to COOMET Secretariat. The main outcome of the 16<sup>th</sup> meeting of COOMET TC 1.12 “CRMs” is highlighted in the article to be published in the journal “Certified reference materials” (No. 4, 2011).

### **3. Review of the finalized projects in the subject field “Certified Reference Materials”**

- 415/RU/08** Development of CRMs for composition of soil agrochemical parameters (2 types),
- 455/RU/09** Pilot comparisons of certified reference materials for composition of alloyed steel: 5XB2CΦ (CRM 918-90Π), X6BΦ (CRM 1527-84Π) and 31X19H9MBET (CRM 2251-82),
- 465/RU/09** Development of CRM for composition and properties of coal, T rank (SO-34),
- 475/RU/09** International comparison tests of CRMs for composition of graphite powder SOG-21 (a set of 5),
- 496/BY/10** Review of COOMET Recommendation R/RM/17:2007 “Guidelines for issuing Certificate of the participant of COOMET CRM interlaboratory certification”.

The results of works on the projects, completed in 2011:

- 474/RU/09** Development of CRM for composition of copper,
- 503/RU/10** Development of CRM for composition of turf-podzol heavy-loamy soil SADPP -07 (agrochemical parameters),
- 502/RU/10** International comparison tests of CRM for composition of copper oxide (OM-2, OM-7) CRM 8608-2004.

are to be submitted to the 22<sup>nd</sup> COOMET Committee meeting.

### **4. Liaisons with international and regional organizations**

For coordination of CRM problems under consideration within COOMET, the liaisons with the leading international organizations ISO/REMCO, OIML TC 3/SC 3, CIS (NTCMetr), COMAR and others are regularly maintained; the Contact Persons from the countries in TC 1.12 “CRMs” and the representatives of these organizations mutually participate in the meetings of international organizations, providing the necessary information on the activity of these organizations. The information on the participation of TC 1.12 members in international events is submitted to the 22<sup>nd</sup> COOMET Committee meeting.

The articles, highlighting cooperation within COOMET and the information, covering CRM activity in the framework of other international organizations: ISO/REMCO, COMAR, BIPM, JCRB, OIML and CIS are regularly published in “Certified Reference Materials” journal.

### **5. Information on the scheduled venue and date of the next meeting of COOMET Contact Persons and Coordinators**

The venue of the 17<sup>th</sup> meeting of TC 1.12 “CRMs” is preliminary agreed upon. It is scheduled in September 2012 in PTB (Braunschweig, Germany), followed by a visit to BAM (Berlin, Germany).

### **6. Proposal to the agenda of the 22<sup>nd</sup> COOMET Committee meeting**

I suggest, that the following points should be included

- 6.1.** In the section “Submittal of COOMET publications, developed and updated in 2011 for approval”:
  - 1. Submittal of CRMs, developed within COOMET, for recognition as COOMET CRMs and information on the progress of the Register of COOMET CRMs.
- 6.2.** In the section “Terms of office of Chairpersons of COOMET structural bodies”:
  - on delegating the authority of the Chairperson of TC 1.12 “CRMs”.

The draft resolutions on the suggested points and working materials will be submitted later on.

Dr. Sergey Medvedevskikh

Chairperson of TC 1.12



**LIST**  
**of the projects on CRM problem, carried out in 2011**

<b>ID</b>	<b>Project No.</b>	<b>Status</b>	<b>Name of the projects</b>
1.	<b>186/RU/99</b>	A	Development of the Programme of joint CRM production within COOMET
2.	<b>358/RU/06</b>	A	Development of CRMs of oxygenate content in petrol
3.	<b>415/RU/08</b>	A	Development of CRMs for composition of soil agrochemical parameters (2 types)
4.	<b>418/RU/08</b>	A	Development of CRMs for composition of ilmenite concentrate (SO-35)
5.	<b>451/KZ/09</b>	P	Development of the List of CRMs to be transported for metrological certification, which are exempted from customs duties, taxes and granting special permissions according to Articles 1-3 of the Agreement of 10 February 1995
6.	<b>455/RU/09</b>	A	Pilot comparisons of CRMs for composition of alloyed steel, type 5XB2CΦ (CRM 918-90Π), X6BΦ (CRM 1527-84Π) and 31X19H9MBET (CRM 2251-82)
7.	<b>463/RU/09</b>	A	Additional certification of CRM 8515-2004 for composition of iron ore (SO-20)
8.	<b>464/RU/09</b>	A	Additional certification of CRM 8516-2004 for composition of manganese ore (SO-21)
9.	<b>465/RU/09</b>	A	Development of CRM for composition and properties of coal, T rank (SO-34)
10.	<b>466/RU/09</b>	A	Development of CRM for composition of zirconium concentrate (SO-36)
11.	<b>474/RU/09</b>	A	Development of CRM for composition of copper
12.	<b>475/RU/09</b>	A	International comparison tests of CRMs for composition of graphite powder SOG-21 (a set of 5)
13.	<b>496/BY/10</b>	A	Review of COOMET Recommendation R/RM/17:2007 "Guidelines for issuing Certificate of the participant of COOMET CRM interlaboratory certification"
14.	<b>498/RU/10</b>	A	COOMET Recommendation. The content and procedure of works on CRM comparison within COOMET
15.	<b>502/RU/10</b>	A	International comparison tests of CRM for composition of copper oxide (OM-2, OM-7) CRM 8608-2004 (CIS CRM 1268:2006)
16.	<b>503/RU/10</b>	A	Development of CRM for composition of turf-podzol heavy-loamy soil SADPP-07 (agrochemical parameters)
17.	<b>521/RU/11</b>	P	Development of CRMs for composition of calcium and zinc in oils (3 types)
18.	<b>522/RU/11</b>	A	Organizing and holding the 16 <sup>th</sup> meeting of COOMET Technical Committee 1.12 "Certified Reference Materials" (TC 1.12 "CRMs")
19.	<b>525/UA/11</b>	P	Development of CRMs for composition of 09G2S steel for chemical analysis and analyzers of combustion
20.	<b>526/UA/11</b>	P	Development of CRMs for composition of high-alloyed high-manganese steel for spectral analysis
21.	<b>536/RU/11</b>	P	Development of CRMs for sulphur microimpurities content in petroleum products (5 types)
22.	<b>537/RU/11</b>	P	Development of CRMs of ultimate temperature of diesel fuel filterability on a cold filter (2 types)
23.	<b>538/RU/11</b>	P	Development of CRMs of lead concentration in motor petrol (4 types)
24.	<b>539/RU/11</b>	P	Development of CRMs of iron concentration in motor petrol (4 types)
25.	<b>543/AM/11</b>	P	Creation and maintenance of Data Base on COOMET CRMs

## **ANNUAL REPORT of Chairperson of TC 2 “Legal Metrology”**

### **1. General features of cooperation in this area**

The COOMET TC 2 coordinates between member countries or on a regional or international level issues on Legal Metrology which are subjects of general interest in this field and/or specified in particular approved projects. The TC 2 is entitled to establish the metrological basis and to set the ground for inter-institutional cooperation regarding the following:

- analysis of possible fields of cooperation with OIML and regional organizations on legal metrology; formulation of suggestions on joint work with them;
- checking documents and recommendations of OIML and other RLMO's for adaption or acceptance in COOMET;
- development of metrological control procedures for measuring instruments and measuring systems with new technologies (i.e. software, data processing, device communication);
- development of criteria for assessment of testing laboratories working in the field of type approval, verification laboratories and other parties with the purpose of mutual recognition of the results of their work;
- planning, organization and realization of COOMET Projects concerning Legal Metrology;
- other matters concerning cooperation and harmonization in the field of Legal Metrology, which are assigned to the TC 2 by the COOMET Committee.

The COOMET TC 2 consists actually of four Subcommittees (SCs)

- SC 2.1 “Harmonization of Regulations and Norms in Legal Metrology”
- SC 2.2 “Technologies of Measuring Devices and Systems in Legal Metrology”
- SC 2.3 “Competence and Assessment of Bodies in Legal Metrology”
- SC 2.4 “Legal Metrology Control”

### **2. TC 2 meeting**

The twelfth meeting of TC 2 “Legal Metrology” was held on 6 – 7 September 2011 in the recreation and sport center Tsakhkadzor with a support of National Metrology Institute of Armenia (CJSC “NIM”). After the TC2 meeting a Seminar “Experiences and Developments in Legal Metrology” took place. 16 representatives from 10 member-countries, as well as invited guest Natasa Mejak-Vukovic, Member of WELMEC Chairperson's Group, participated in the meeting.

Summary of TC 2 meeting's reports and decisions:

- 1) Secretariat of TC 2 is established of the representatives of BelGIM (Belarus) Mr. Maxim Shabanov and Ms. Nadezda Lyakhova.
- 2) Election of chairperson of SC2.1 from Russia was urged and corresponding request has been sent to COOMET Committee member from Russia – Mr. V. Krutikov.
- 3) Member's list of TC 2 and SC 2.1 – SC 2.4 was updated and relevant information can be found in working documents of COOMET Committee and on the COOMET web-portal (TC 2 page).
- 4) Changes to Regulations of TC 2 are prepared for approval by COOMET Committee and assume elimination of the member list and improvement of organizational structure (point 1.2) and responsibilities of TC 2 (point 1.5), taking into consideration the objectives of TC 2 in general and also SC 2.1 – SC 2.4 (amended tasks of TC2 are given in clause 1 of present report).
- 5) Updated section “Legal Metrology” of COOMET Development Program for 2011-2013 is approved and submitted to COOMET Secretariat.

- 6) TC2 Secretariat finished arrangements for facilitating exchange of information between TC 2 and SC 2.1 – SC2.4 members via COOMET web-portal (TC 2 page) – [www.coomet.net](http://www.coomet.net) – also in the restricted access mode.

In 2012 it is planned to put links to the lists of basic documents (data bases) of international and regional legal metrology organizations (OIML, WELMEC) on the COOMET web-portal (section TC2) as well as short description of Legal metrology in COOMET member-countries.

- 7) Updated Work program of TC 2 is agreed (Annex 1 to the report). Currently an analysis of COOMET member-country's willingness to join and develop approved projects is being carried out.
- 8) A lack of mandatory requirements on prepackages and practical developments of prepackages control in the majority of COOMET countries was noted (except of Belarus and Moldova). It was decided to initiate COOMET workshops on prepackages control issues

### 3. Status of COOMET projects in LM

Information about TC2 projects is given in Work program of TC 2 (Annex 1 to the report). Participants of the last TC2 meeting considered fulfillment of projects under elaboration. Some recommendations were given to facilitate their completion (see Minutes of TC 2 meeting).

In 2011 COOMET project **424/BY/08** "Translation and analysis of new edition of VIM" was finished. Translation of VIM made by specialists of BelGIM is available on COOMET web-portal [www.coomet.net](http://www.coomet.net) (section "Projects of TC2"). Alternative translation was prepared by Russia and is available on ISO official website (on a fee basis).

In 2011 two new projects were proposed:

- project **523/BY/11** "Development of a procedure for attributing technical devices to measuring instruments"; coordinator – M. Shabanov, BelGIM, Belarus);
- project **533/BY/11** "Development of a recommendation for determining amount of prepackage filling with the purpose to make a decision whether this prepackage is a misleading one"; coordinator – N. Lyakhova, BelGIM, Belarus)..

Project's coordinators made presentations showing tasks and approaches to their realization. Participants of the meeting supported the idea to hold a workshop for improving fulfillment of the project **533/BY/11**. This proposal is currently under consideration.

### 4. Next TC 2 meeting

Next TC 2 meeting is planned for September 2012 года. The venue is being negotiated.

### 5. Proposals and decisions of COOMET Committee

Proposed draft resolutions of COOMET Committee:

1. To approve Work program of TC 2 "Legal metrology" for 2011 – 2012.
2. To recommend COOMET member-countries while revising or developing legal documents and national metrological terminology standards to adopt, as much as possible, terminology of international vocabularies of metrology such as VIM "Vocabulary Internationale de Metrologe" (ISO GUIDE 99) and OIML VIML "Vocabulary Internationale de Metrologe Legale".

Olaf Kühn  
Chairperson of TC 2

## TC 2 Work Program for 2011 – 2012

point	Project ID	Project name	Coordinator	Participants	Scheduled starting date	Remarks
<b>Chairperson TC2 Correspondence with OIML, RMOs and NMIs</b>						
<b>Development Topic</b>	<b>Analysis of possible fields of cooperation with OIML and regional organizations on legal metrology. Formulation of suggestions on joint work with them</b>				2011-2013	
2.0.1		Analysis of developments and possible cooperation in OIML, RMO's and NMI's and suggestion of joint work	O.Kuhn (LMET, Germany)		2008	General Task of Chair TC2
2.0.2		Preparation a questionnaire among the COOMET Members for building up a list of experts in legal metrology	O.Kuhn (LMET, Germany)		2009	<b>Finished</b>
2.0.3		Extend the List of OIML- and WELMEC-Contact persons to its subcommittees	O.Kuhn (LMET, Germany)		2010	<b>In progress</b>
2.0.4		To collect and process information for the TC2 section of the new COOMET web portal	Secretary of Chair TC2		2010	<b>In progress</b>
2.0.5		Holding workshops on legal metrology	Chair TC2 and TC4		2011	2011: 7-8.09.2011, Yerevan, Armenia <b>(finished)</b>
<b>SC 2.1 Harmonization of Regulations and Norms in Legal Metrology</b>						
<b>Development Topic</b>	<b>Checking documents and recommendations of OIML and other RLMO's for adaption or acceptance in COOMET</b>				2011-2013	
2.1.1	424/BY/08	Translation of new project of VIM	N. Zhagora (BelGIM, Belarus)	Belarus, Russia, Ukraine	2008	<b>Finished (2011)</b>
2.1.2	427/BY/08	Analysis of requirements in the field of legal metrology including examples of application of these requirements to measuring instruments	N. Zhagora (BelGIM, Belarus)	Belarus, Russia, Ukraine	2008	<b>In progress</b>
2.1.3	New 2009	Translation of international vocabulary of legal metrology (VIML)	VNIIMS	Russia, Belarus	2009	under registration
2.1.4	New 2010	To check out uniformity of erification\calibration certificates issued in COOMET member countries and come up with a suggestion on unification, if required (initiator is Ukraine)	NNC "IM", Ukraine	Belarus, Russia, Ukraine	2010	under registration
2.1.5	New 2010	Analysis of OIML D16 "Principles of assurance of metrological control"	O. Kühn (LMET, Germany)		2011	To present at the Seminar (2011)

point	Project ID	Project name	Coordinator	Participants	Scheduled starting date	Remarks
2.1.6	New 2011	Create a database for interested and accepted rules, guides, recommendations and standards in the field of legal metrology between COOMET member-countries and other regional legal metrology organizations	O. Kühn (LMET, Germany)		2011	<b>In progress</b> It will be realized by putting corresponding links on the COOMET web-portal (TC2 page)
2.1.7	New 523/BY/11	Development of a procedure for attributing technical devices to measuring instruments	M. Shabanov (BelGIM, Belarus)	Belarus, Russia, Ukraine, Kazhastan, Moldova, Armenia, Uzbekistan	2011	<b>In progress</b> To present at the TC 2 meeting (2011)
<b>SC 2.2 Technologies of Measuring Devices and Systems in Legal Metrology</b>						
<b>Development Topic</b>		<b>Development of metrological control procedures for measuring instruments and measuring systems with new technologies (i.e. software, data processing, device communication)</b>			2011-2013	
2.2.1	425/BY/08	Development of a template of test procedure for software of measuring instruments	M. Shabanov (BelGIM, Belarus)	Belarus, Russia, Ukraine	2008	<b>In progress</b>
2.2.2	437/BY/08	Development of a program for generating 'reference' data sets for the purpose of software testing	M. Shabanov (BelGIM, Belarus)	Belarus, Russia, Ukraine	2008	<b>Suspended</b>
2.2.3	New 2010	Analysis of new technologies for measuring instruments	O.Kühn (LMET, Germany)	Germany	2010	The presentation was given at the TC 2 meeting (2010)
<b>SC 2.3 Competence and Assessment of Bodies in Legal Metrology</b>						
<b>Development Topic</b>		<b>Development of criteria for assessment of testing laboratories working in the field of type approval, verification laboratories and other parties with the purpose of mutual recognition of the results of their work</b>			2011-2013	
2.3.1	442/UA/08	Analysis of criteria of technical competence used for assessment of verification laboratories	O. Maletskaya (NNC "IM", Ukraine)	Ukraine, Belarus, Russia	2008	Taking into consideration ISO 10012, ISO 17025 <b>Finished</b> (presentation was made at the TC 2 meeting (2010))
2.3.2	426/BY/08	Development of recommendation regarding realization of interlaboratory comparisons (PT schemes) for verification laboratories for assessing their technical competence	M. Shabanov (BelGIM, Belarus)	Belarus, Ukraine, Russia	2008	<b>In progress</b>

point	Project ID	Project name	Coordinator	Participants	Scheduled starting date	Remarks
2.3.3	491/UA/10	Development of COOMET recommendation "General requirements to the competence of verification laboratories"	O. Maletskaia (NNC "IM", Ukraine)	Belarus, Ukraine, Russia	2010	<b>In progress</b>
2.3.4	New 2010	Requirements for the testing laboratories involved in type approval testing	M. Shabanov (BelGIM, Belarus)	Belarus, Ukraine, Russia	2009	<b>Suspended</b> (Considering OIML D30)
2.3.5	New 2010	To work out criteria for evaluating longterm performance of verification labs (by scores, etc.)	O. Maletskaia (NNC "IM", Ukraine)	Ukraine	2010	<b>Objectives of the project should be explained</b>
<b>SC 2.4 Legal Metrology Control</b>						
<b>Development Topic</b>		<b>Development of interstate collaboration and mutual acceptance on legal metrological control of prepackages and measuring instruments</b>			2011-2013	
2.4.1	441/RU/08	Development of template of bilateral agreement on recognition of national prepackages control mark	R. Genkina (VNIIMS, Russia)	Belarus, Russia, Ukraine	2008	<b>Continued</b> (draft document is available)
2.4.2	-	Workshop "Issues of prepackaged goods control"	PTB (Germany) VMT (Lithuania)	Azerbaijan, Armenia, Belarus, Bulgaria, Georgia, Kazakhstan, Kyrgyzstan, Lithuania, Moldova, Russia, Ukraine	2008	<b>Finished</b>
2.4.3	-	Analysis and Conception for Market Surveillance and proposals for establishment of an special working group	Proposed for discussion by O. Kühn (LMET, Germany)		2010	<b>Suspended</b> as a result of discussion at the TC 2 meeting (2010)
2.4.4	-	Planning the participation on WELMEC-Seminars on conformity assessment and market surveillance of MID-Instruments	O. Kühn (LMET, Germany)	Germany	2010	<b>Finished</b>
2.4.5	New 2010	Informing on seminar "Conformity to type (CTT)"	O. Kühn (LMET, Germany)	interested members	2011	<b>In progress</b>
2.4.6	New 533/BY/11	Development of a recommendation for determining amount of prepackage filling with the purpose to make a decision whether this prepackage is a misleading one	N. Lyakhova, (BelGIM, Belarus)	Belarus, Armenia, Azerbaijan, Russia, Uzbekistan and SC2.4 Members	2011	<b>In progress</b> The presentation was given at the TC 2 meeting (2011)

## **ANNUAL REPORT**

### **of Chairperson of Technical Committee of Quality Forum (3.1)**

#### **1. General characteristic of cooperation**

In view of the increasing process of globalization in metrology, the International Arrangement of Mutual Recognition of Measurement Standards (MRA) was concluded under the aegis of BIPM. One of the requirements of this arrangement is to implement a Quality Management System (QMS) at national metrology institutes in accordance with ISO/IEC 17025:2005 and ISO Guide 34. 2004 was the year when the transient period of the MRA elapsed which means that an NMI wishing to publish its calibration and measurement capabilities (CMCs) in the international data base of BIPM must confirm these CMCs not only through international comparisons but also through its recognized QMS. COOMET Quality Forum (QF) as a structural body of COOMET was established in 2002. The basic task of COOMET QF is to coordinate and help COOMET member countries in implementing and applying QMS in metrology institutes in accordance with the MRA requirements. The participants of cooperation within the QF are all COOMET member countries wishing to participate. The QF is also open for other countries. The QF organizes two-three days' meetings to discuss QMS presented by COOMET NMIs (written and oral presentations of QMS of COOMET NMIs). Documents about QMS of COOMET NMIs are approved and fundamental problems of cooperation within this field are solved. 22 NMIs from 17 COOMET member countries now cooperate within the QF at the meetings of the QF. COOMET QF has its Technical Committee which solves the main problems related with the activities of COOMET QF and which has designated representatives of COOMET countries as its members. The earlier approved list of auditors and technical experts of COOMET is being updated. The task of the auditors and technical experts of COOMET is to carry out peer reviews of QMS of COOMET NMIs. Documentation about the rules and procedure for carrying out these peer reviews of QMS has been developed. In case of positive results of the peer review of a QMS the NMI receives recognition of its QMS for five years by the decision of the Technical Committee of COOMET QF.

#### **2. Results of the last meeting of the QF**

During the reported period the 13<sup>th</sup> meeting of the Technical Committee of the QF (19 May 2011, Kiev) and the 12<sup>th</sup> meeting of the COOMET QF (19-20 May 2011, Kiev) were held immediately after the peer reviews of the QMS of two Ukrainian NMIs (NSC "IM" and Ukrmetrteststandart).

During the meeting of the TC of COOMET QF the conducted peers reviews the QMS of three COOMET NMIs, BelgIM (Belarus), NSC "IM" (Ukraine) and Ukrmetrteststandart (Ukraine) were discussed. As a result of these peer reviews the QMS of the mentioned NMIs of COOMET were recognized for further five years. During the meeting Annex 14 (Recommended Questionnaire), the deadlines for the revision of Annexes 10 (QMS Annual Report by NMI COOMET) and 11 (Recommendation on annual report preparation of Quality Management System of NMIs) to the document of COOMET QF "Recommendation. Order and Procedure for Evaluating the Quality Management System of National Metrology Institutes", and the deadlines for the development of the draft document "Unified COOMET Certificate for CRMs" were agreed on.

During the meeting the deadlines for QMS peer reviews in 2011 were agreed on. The peer reviews of the QMS of UNIIM (Russia), SNIIM (Russia), DP NDI "Systema" (Ukraine), VNIIR (Russia) and INMS (Moldova) are scheduled for autumn 2011. The peer reviews of the QMS of DP NDI "Systema" (Ukraine) and VNIIR (Russia) were shifted for the January-February 2012. The peer review of INMS (Moldova) was postponed for an uncertain period due to personnel changes in the institute and lack of an application for review.

During the 12<sup>th</sup> meeting of the COOMET QF, held on 19-20 May 2011 immediately after the meeting of the TC of the COOMET QF, SNIIM (Russia), UNIIM (Russia), DP NDI “Systema” (Ukraine) submitted their QMS for repeat review (after a five-years’ period), VNIIR (Russia) for repeat review; INSM (Moldova) and NMC Azstandard (Azerbaijan) presented their CMC for the first time. Presentations of SNIIM (Russia), UNIIM (Russia), DP NDI “Systema” (Ukraine), VNIIR (Russia) and INSM (Moldova) were approved. A recommendation was made to NMC Azstandard (Azerbaijan) to present their QMS in a short form at the next QF meeting. Most COOMET NMIs now have the status of COOMET recognition of their QMS (Annex 1).

### 3. Overview of projects

There are three projects registered within the COOMET QF:

**230/SK/01** Interpretation and implementation of the quality systems of COOMET members RMOs in conformity with the ISO 17025 (INSISK)

**280/BY/03** Organization and holding of the meetings of COOMET Quality Forum and TC 3.1, as well as the training workshop “Philosophy of Development and Implementation of Quality Management Systems according to ISO/IEC 17025 in Testing and Calibration Laboratories” – completed.

**360/SK/05** Holding the seminar “Quality and Metrology” – the seminar was postponed for an uncertain period.

### 4. Cooperation with international organizations

During the meetings of JCRB held twice a year the representatives of the COOMET QF inform about the activities of the QF and confirm that COOMET develops its activity on the implementation of QMS in accordance with the requirements of the MRA.

The COOMET QF always tries to harmonize its valid rules and procedures with the rules adopted by JCRB.

### 5. The next meeting of the COOMET QF

The next 13<sup>th</sup> meeting of the COOMET QF is scheduled in March 2012 in Bratislava, Slovakia. It is planned to present the results of the repeat QMS peer reviews of the following COOMET NMIs: Russian UNIIM, SNIIM and Ukrainian DP NDI “Systema” (Ukraine) (after a 5 years’ period) and Russian VNIIR. It is also planned to repeat written and oral presentations of the QMS of INIMET (Cuba), CENTIS-DMR (Cuba), CPHR (Cuba), Ivano-Frankovskstandartmetrologia (Ukraine). It is planned to hear a short oral presentation of INSM (Moldova) with changes after May 2011, a short oral presentation of NMC Azstandard (Azerbaijan), and short information about QMS of Gruzstandard (Georgia).

### 6. Proposals for the meeting of COOMET Committee

1. To approve the updated document of COOMET QF “Recommendation for Evaluating the Quality Management System of National Metrology Institutes”.
2. To approve the revised Annexes No. 10, 11, and 14 to the document “Recommendation. Order and Procedure for Evaluating the Quality Management System of National Metrology Institutes”.
3. To ask COOMET Committee members to appoint candidates from their countries to be members of the Technical Committee of COOMET QF on a long-term basis.

In connection with the urgent importance of the activity of COOMET QF from the point of view of globalization in metrology, let me ask all COOMET member countries represented by COOMET Committee members to support the activity of the QF in every possible way, because I am sure that the implementation and application of QMS in metrology institutes are now one of the most important fields of cooperation.

Ekaterina Kromkova

Secretariat of Technical Committee of COOMET Quality Forum



## COOMET NMIs having the status of QMS Recognition

No.	State and name of NMI	QMS status	Issued	Valid	Issued (after 5 years)	Valid
1	Russia, VNIIM	Recognition	<b>20.09.2005</b>	20.9.2010 (prolonged until 20.2.2011)	14.10.2010	14.10.2015
2	Russia, VNIIMS	Recognition	20.12.2005	20.12.2010	14.10.2010	14.10.2015
3	Russia, VNIIOFI	Recognition	20.12.2005	20.12.2010	14.10.2010	14.10.2015
4	Russia, VNIIFTRI	Recognition	20.12.2005	20.12.2010	14.10.2010	14.10.2015
5	Belarus, BelGIM	Recognition	20.12.2005	20.12.2010 (prolonged until 31.5.2011)	19.05.2011	19.05.2016
6	Ukraine, NSC IM	Recognition	20.12.2005	20.12.2010 (prolonged until 31.5.2011)	19.05.2011	19.05.2016
7	Ukraine, Ukrmetrteststandart	Recognition	20.12.2005	20.12.2010 (prolonged until 31.5.2011)	19.05.2011	19.05.2016
8	Russia, UNIIM	Recognition	30.03.2007	30.3.2012		
9	Russia, SNIIM	Recognition	30.03.2007	30.3.2012		
10	Ukraine, DP NDI "Systema"	Recognition	30.03.2007	30.3.2012		
11	Ukraine, Ivano-Frankovskstandartmetrologia	Recognition	8.04.2008	8.4.2013		
12	Cuba, INIMET	Recognition	8.04.2008	8.4.2013		
13	Cuba, CENTIS-DMR	Recognition	8.04.2008	8.4.2013		
14	Cuba, CPHR	Recognition	8.04.2008	8.4.2013		
15	Kazakhstan, KazInMetr	Recognition	14.10.2010	14.10.2015		



- Certificates which became invalid

## ANNUAL REPORT of Chairperson of TC 4 “Information and Training”

### 1. General characteristic of cooperation

Technical committee “Information and Training” (TC 4) was created in May 2002.

During the reporting period the work within TC was conducted on the base of Programme of work of TC 4 2009–2011 in five subcommittees:

- SC 4.1 “COOMET Development Based on the Analysis of International Experience”;
- SC 4.2 “Information and Information Technology”;
- SC 4.3 “Training and Raising the Proficiency Level of Experts”;
- SC 4.4 “Coordination of Work with Young Metrologists of COOMET Member Countries”;
- SC 4.5 “Support in Developing the Basic Metrological Infrastructure of COOMET Member Countries”.

### 2. Survey of implemented projects and their results

In 2011 the work was conducted on the following registered projects:

**404/RU/07** Development of a procedure of forming and publishing at COOMET web-sources informational data about calibration and measurement service of NMI laboratories of COOMET member countries

The aim of the project is posting at the website of COOMET data base and providing the open interactive access of organizations which can get appropriate metrological service.

The implementation of the Project was discussed at the meetings of President’s Council and COOMET Committee. For posting the data base at COOMET web-site and providing an open interactive access to it of organizations which can be provided by the appropriate metrological service, the draft of COOMET Recommendation was developed, where the order and publication conditions of such data and also technology of peer review at COOMET web-site are regulated.

Project coordinator V. Bugaev presented the developed project of CMS data base using the example of Russia.

During the discussion at the 8<sup>th</sup> meeting of TC 4 there was a number of critical notes, however the participants of the meeting agreed, that such information will be useful for NMIs – SC 4.5 members and for those countries, which were still studying to held comparisons and wanted to sign CIPM MRA. It was decided to overwork and to simplify the procedure content, leaving at this stage CMS of only NMI of COOMET member-countries.

**478/UA/09** Creation of working COOMET web-portal

At the 15<sup>th</sup> meeting of COOMET President’s Council to launch COOMET web-portal (<http://coomet.net>) for the open access since 26 October 2010 parallel with acting COOMET siteb ([www.coomet.org](http://www.coomet.org)).

In March and December 2010 there are conducted 2 training workshops for on-line editors of pages of COOMET member countries and COOMET Technical Committees respectively.

**500/UA/10** Development of COOMET Document “COOMET web-portal. The main statements. Order of maintenance and information presentation”

The aim of the project is preparation and Agreement of COOMET Document on organization of COOMET web-portal functioning and presenting on it information of member countries and technical committees.

The draft document was discussed at the 8<sup>th</sup> meeting of TC 4, distributed to COOMET Committee members, Chairpersons of TCs, and TC 4 members for approval.

**510/KZ/10** Determination of the needs of NMIs of COOMET member countries in training and on-job training

The Project is open for determining the basic thematic directions on trainings and trainings abroad for planning and organization of training events within COOMET. A questionnaire was developed and was sent to NMIs for filling in to find out the interests of NMIs of COOMET member-countries in trainings and trainings abroad, taking into account the discussions in 2010 at the 7th TC 4 meeting and the results of workshop “Evaluation of PTB-COOMET Project and planning the second stage” within SC 4.5.

In May 2011 there was prepared a form of agreed Project. The form includes new training topics and also was proposed to fill in the form separately for young metrologists and for specialists having working experience.

Summary form on the results of polling is prepared by COOMET Secretariat.

A decision was made at the 8<sup>th</sup> meeting of TC 4 (September 2011) to formulate specific topics for workshops and training abroad (based on received information from member countries), to elaborate proposals, to determine the procedure of training and financing.

**518/UZ/11** Training of specialists of measuring, calibration and testing laboratories

The aim of the project is application of modular approach in training on the base of step-by-step implementation of uncertainty conception into the practice of laboratory work. There are developed 9 training modules with application of system approach in distribution of functional module load (from basic to specialized). Such approach allows to train laboratory specialists of different qualification and to include into the training programmes practical aspects of laboratory work in accordance with the requirements of ISO/IEC 17025 standard.

A decision was made at the 8<sup>th</sup> meeting of TC 4 to go on developing the modular approach to training the specialists of measurement, calibration and testing laboratories, to formulate the actions more specifically to be made within this project, and to make the project agreed.

**3. Results of the TC meeting**

*The 8<sup>th</sup> meeting* of TC 4 “Information and Training” was held on 28-29 September, 2011, RSE “KazInMetr”, Astana, Kazakhstan. 21 representatives from 11 countries, heads of subcommittees and TC 4 members and also invitee took part in the meeting.

The participants of the meeting exchanged the information about NMI activity of COOMET member countries in the field of training of specialists, information and information technologies in 2010-2011, discussed the Programme of Work of TC 4 for 2009-2011 and also the state of implementation of COOMET Projects.

It was decided at the meeting to prepare a Programme of Work for TC 4 for 2012–2014 and circulate it to the Chairpersons of SCs and TC 4 members.

A decision was made to change the structure of TC 4:

- to exclude from the membership of TC 4 SC 4.1 “COOMET development on the base of analysis of the use of international experience”;
- to rename SC 4.2 into “COOMET Informational sources” (Chairperson – V. Bugaev, VNIIFTRI, Russia);
- to join SC 4.3 “Preparation and raising qualification of specialists” and SC 4.4 “Coordination of work with young metrologists of COOMET member-countries” and to create new subcommittee SC 4.3 “Raising Proficiency Level and work with young metrologists” (Chairperson – V. Ivanov, VNIIMS, Russia, Deputy Chairperson V. Lobko, BELGIM, Belarus);
- to change the number of SC 4.5 “Support in development of metrological infrastructure of COOMET member countries” for SC 4.1 with the previous name (Chairperson – D. Sharipov, RGP “KazInMetr”, Kazakhstan);

and to recommend a new structure of TC 4 “Information and Training” for approval at the 22<sup>nd</sup> COOMET Committee meeting:

- SC 4.1 “Support in Developing the Basic Metrological Infrastructure of COOMET Member Countries” (Chairperson – D. Sharipov, RSE “KazInMetr”, Kazakhstan);
- SC 4.2 “COOMET Informational Sources” (Chairperson – V. Bugaev, VNIIFTRI, Russia);
- SC 4.3 “Raising Proficiency Level and Work with Young Metrologists” (Chairperson – V. Ivanov, VNIIMS, Russia; Deputy Chairperson – V. Lobko, BelGIM, Belarus).

In this regard a decision was made to update COOMET Document D5.13/2004 “Regulation on TC 4”.

Among the participants of the meeting there was a discussion on the order of holding the International Competition “The best young metrologist of COOMET”.

There was discussed the possibility of attracting for participation in the competition of young metrologists from other RMOs during its holding in 2013 in PTB.

It was also proposed to change the criteria of evaluation to give the opportunity of participation in the competition to the metrologists from countries with developing metrological infrastructure.

A decision was made to hold the 9<sup>th</sup> meeting of TC 4 “Information and Training” in Minsk, Belarus, in September 2012.

#### **4. The results of training workshops:**

##### **4.1. On preparation of pilot comparison in the field of mass measurement**

On 23-25 May 2011 in Astana, Kazakhstan, the training workshop on preparation of pilot comparison in the field of mass measurement was held.

19 representatives from 13 COOMET member-countries took part in the seminar.

The subjects of the workshops were:

- preparation of pilot comparison in the field of mass measurement (multiple and submultiple kilogram units) with the aim of prior evaluation of the deviation of measurement results;
- phased discussion of the mass measurement procedure and uncertainty estimation at the training workshop;
- phased discussion of declaration of CMC entries in the KCDB database.

##### **4.2. On preparation of pilot supplementary comparison in the field of ionizing radiation**

On 23-25 May 2011 in Braunschweig, Germany, a training workshop on preparation of pilot supplementary comparison in the field of ionizing radiation was held.

21 representative from 15 COOMET member-countries took part in the workshop.

The goal of the Workshop was to prepare the participants for the procedure to get entrances into the CMC list in the metrological area of Ionizing Radiation, Section I, X and gamma rays. Topics of the Workshop were a review on the current status of air kerma standards, reference X radiation qualities used in radiation therapy, diagnostic radiology and radiation protection, calibration procedures and their uncertainties, general content of the CIPM MRA, procedures of regional key- and supplementary comparisons in ionizing radiation (X and gamma rays), basic requirements on quality management systems.

During the Workshop there was a practical demonstration of the calibration of an ionization chamber in terms of air kerma at the X rays and Cs-137 irradiation facilities of the PTB.

##### **4.3. Experience and achievements in legal metrology**

On 7–8 September 2011 in Yerevan, Armenia, training workshop “Experience and achievements in legal metrology” was held.

10 representatives from 10 COOMET member countries took part in the seminar.

Such topics as: European Directives and principles of mutual recognition, Law on metrology OIML D1, market surveillance on service putting into market etc.

### **5. The results of IV International competition “The best young metrologist of COOMET – 2011”**

On 15-17 June 2011 in Moscow, Russia, IV International competition “The best young metrologist of COOMET - 2011” was held.

18 young metrologists from 10 COOMET member-countries took part in the competition.

The scope of presented scientific papers of competitors can be divided into three main groups of metrological works:

- metrological assurance of modern technologies;
- creation and improvement of standards, instruments and methods of quality unit transfer;
- metrological assurance of the main problems of economy and social sphere.

The winner of the competition is Sergey Golubev (VNIIMS, Russia). The second place took Fateme Yagobiyan, Iran, having now a training course in PTB, Germany. The third place took Tobias Klein (PTB, Germany). Tatyana Sosnovskaya (BelGIM, Belarus) was awarded for the best report in English.

Competitive commission noted the high level of the works of COOMET young metrologists and quality of presenting the reports.

### **6. Work on participation in the implementation of the CIPM MRA**

Information about the CIPM MRA realization is posted on the pages of [www.coomet.net](http://www.coomet.net) and [www.coomet.org](http://www.coomet.org). Posting the information at [www.coomet.net](http://www.coomet.net) is conducted by COOMET Secretariat and by on-line editors of countries and COOMET Technical Committees, at [www.coomet.org](http://www.coomet.org) – by site administrator, Chairperson of SC 4.2 “Information Technology” V. Bugaev.

Pavel Neyezhmakov  
Chairperson of TC 4

**WORK PROGRAMME**  
**of Technical Committee of COOMET TC 4 “Information and Training” for 2012-2014**

No.	Project ID	Name of Project / work	Coordinator of Project / work	Participants	Supposed terms of realization	Notes
<b>SC 4.1 “Support in Developing the Basic Metrological Infrastructure of COOMET Member Countries”</b>						
4.1.1		Analysis of structures of National metrological services of new COOMET members	Chairperson of TC 4 Chairperson of SC 4.1	TC 4 Members	2013	
4.1.2		Preparation of the list of problems, existing in COOMET member countries of Central Asia and Caucasus	Chairperson of SC 4.1	TC 4 Members	2013	
4.1.3		Preparation of information and analytical materials about advantages of participation in CIPM MRA	Chairperson of TC 4 Chairperson of JCMS	TC 4 Members	2013	
4.1.4		Development of recommendations on preparation of the countries for signing CIPM MRA	COOMET President’s Council, COOMET Committee Members		2013–2014	
4.1.5		Preparation and conducting training workshops for NMI staff of COOMET member countries from Central Asia and Caucasus	Chairperson of TC 4 Chairperson of SC 4.1	SC 4.1 Members	2012–2014	
<b>SC 4.2 “COOMET Informational Sources”</b>						
4.2.1		Development and support of informational COOMET sources: web-site, web-portal and databases	Chairperson of SC 4.2 Site and portal administrators On-line editors of portal	TC 4 Members	2012–2014	Including within Project 478/UA/09
4.2.2		Development and realization of the Conception of COOMET internet sources development	Chairperson of SC 4.2 Site administrator	Members of SC 4.2	2012–2013	Draft Conception – 25.01.2012
4.2.3	404/RU/07	Development of the procedure of forming and publishing at COOMET web-sources informational data about calibration and measurement services of NMI laboratories of COOMET member countries	Project coordinators V. Ivanov, V. Bugaev		2012–2014	
4.2.4		Preparing and publishing regional editions of COOMET (reports, researches, annotations) in the field of metrology for attracting the attention from the side of political and economic communities in COOMET member countries	Head of COOMET Secretariat, COOMET Secretariat	TC 4 Members	2012–2014	Not less than 2 per year
4.2.5		Introduction of changes in Document COOMET D6/2003 “Order of COOMET site maintenance”	Chairperson of SC 4.2		April 2012	
4.2.6	500/UA/10	Development of COOMET Document “Web-portal of COOMET. Main statements. Order of maintenance and information presentation”	Chairperson of TC 4	TC 4 Members	2012	

No.	Project ID	Name of Project / work	Coordinator of Project / work	Participants	Supposed terms of realization	Notes
4.2.7		Selection, preparation and training of technical administrators of COOMET web-portal	Chairperson of TC 4, SC 4.2	TC 4 Members from Germany	2012–2013	
4.2.8		Preparation of the base presentation about COOMET activity	COOMET Secretariat		2012	
<b>SC 4.3 “Raising Proficiency Level and Work with Young Metrologists”</b>						
4.3.1	518/UZ-a/11	Training of specialist of measurement, calibration and testing laboratories	Project coordinators O. Hakimov	Members of working group	2012–2014	
4.3.2	541/RU-a/11	Development of recommendations on the content of training programmes and trainings abroad of specialists within COOMET	TC 4 Member from Russia V. Ivanov	TC 4 Members	2012–2014	
4.3.3		Preparation of annual programmes for training workshops on actual questions of metrology	Chairperson of TC 4, Chairpersons of SC 4.1, SC 4.3		2012–2014	Tak. into account the results of implementation of Project 510/KZ/10
4.3.4	510/KZ/10	Determining the concrete topics of workshops and trainings abroad (on the base of polling information from COOMET member countries in holding workshops and trainings abroad)	Project coordinators K. Saktybbaeva V. Lobko	Members of SC 4.3 COOMET Committee Members	January 2012	
		Preparation of the questionnaire on determining the possibilities of NMI for holding workshops and trainings abroad, distribution in NMI and generalization of the got information			February – April 2012	
		Preparation of proposals for TC 4 for forming annual programmes of training workshops on actual questions of metrology			September 2012	
4.3.5		Introduction of changes in Recommendation COOMET R/GM/18:2010 “Order of holding the International competition “The best young metrologist of COOMET” and	Deputy Chairperson of SC 4.3	Members of SC 4.3		
		- preparation and adoption of the changes			September 2012	
		- adoption of new edition			April 2013	
4.3.6		Holding V International competition “The best young metrologist of COOMET”	Deputy Chairperson of SC 4.3	TC 4 Member from Germany	2013	
4.3.7	New Project	Development of the methods of organizing and conducting interactive workshops via COOMET web-sources	TC 4 Member from Germany A. Koegler			