

10 March 2010

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## **1. General Aspects**

The activities in connection with the European Metrology Research Programme were in the main focus of the TC-EM in the period 2009/2010. The TC-EM community is involved in seven research projects running under iMERA-Plus and was involved in the preparation of seven project proposals for the energy call 2009.

In 2009 the newly formed subcommittee "Power & Energy" started its activities reflecting the increasing importance of electrical metrology in the energy field.

The organisation and analysis of comparisons and the review of Calibration and Measurement Capabilities (CMC) still play an important role in the agenda of the TC-EM. Despite some progress, the processes, especially the inter-RMO review of CMCs, are still too slow. The improvement of the MRA procedures will, thus, be an important task of the committee in the next future.

## **2. Projects**

Detailed information about the EURAMET projects in the EM field can be obtained from the EURAMET web-site. An overview of the number of projects is given in the table below.

	<b>Comparison</b>	<b>Consultation</b>	<b>Co-operation &amp; research</b>	<b>Traceability</b>	<b>Total</b>
<b>On-going</b>	21 (21)	3 (2)	3 (5)	10 (10)	37 (38)
<b>Completed</b>	66 (63)	56 (56)	43 (41)	2 (2)	167 (162)
<b>Total</b>	87 (84)	59 (58)	46 (46)	12 (12)	204 (200)

(Figures in brackets denote the numbers of the previous period)

The number of projects is on the level of the preceding years. The number of active comparisons is stabilizing at a level which is lower than in the period after the coming into force of the MRA. In the co-operation and research projects a shift towards joint research projects in the framework of the EMRP has occurred. The number of traceability projects does not reflect the real situation in the field. Especially the cases, where a NMI establishes traceability through the calibration of its equipment in another NMI, are not documented. The present form for documenting traceability is not ideal and should be rethought to get a better view of the actual situation.

## **3. Comparisons**

Presently, 20 (16) (number in brackets: previous period) EURAMET key or supplementary comparisons (9 KCs, 11 SCs) are active in the EM field. The total number of comparisons listed in the key comparison data base sums up to 22 (22) KCs and 31 (29) SCs. Besides this, EURAMET is or has been active in a large number of CCEM comparisons: 9 BIPM KCs, 49 CCEM KCs and 2 CCEM SCs.

## **4. CMCs**

### **4.1 EURAMET EM CMCs**

The following CMC sets passed the intra-RMO and inter-RMO review in 2009:

- EURAMET.EM.5.2009: Fast track review of 63 entries in the high voltage field from MIKES (FI); publication: 9 April 2009.
- EURAMET.EM.6.2010: Set of 581 entries from 15 NMIs. The inter-RMO review was submitted to the inter-RMO review on 6 April 2009. Four RMOs (AFRIMETS, APMP, COOMET and SIM) reviewed between 41% and 79% of the entries. The review was completed at the end of 2009. The process, thus, took eight months which is still too long. The CCEM working group for RMO coordination will discuss this issue and establish harmonized review procedures among the RMOs.

## **4.2 Inter-regional review of CMCs**

The TCEM carried out the following inter-RMO reviews in 2009:

- COOMET.EM.4.2008: Review of 14 entries from NSC “Institute of Metrology”, Ukraine from Feb. 2009 to 8 May 2009.
- SIM.EM.3.2009: Review of 363 entries from INTI (Argentina), INMETRO (Brazil) and ICE-LMVE (Costa Rica) from May 2009 to 20 July 2009.

## **4.3 Peer review**

To support their CMC entries, the following laboratories organised a peer review following the JCRB recommendations:

- VSL, Netherlands

The on-site peer reviews are reported in form of a EURAMET consultation projects. The review outcomes are documented in a separate report open to the reviewed institute and the reviewers.

## **5. Activities of the Sub-Committees**

### **5.1 SC “DC and Quantum Metrology”**

Convenor: F. Piquemal, LNE

- The DC-QM expert meeting took place at LNE, Trappes, from 3 to 5 June, with 70 participants from 22 countries and the BIPM. During the meeting, 11 invited talks were given and 31 posters were presented. The contributions covered a wide spectrum of the research activities in quantum metrology.
- The project meeting of the iMERA-Plus projects ULQHE, REUNIAM, JoSY and Nanospin were organised as satellite meetings.

### **5.2 SC “Low Frequency”**

Convenor: K.-E. Rydler, SP

- The LF experts meeting took place from 25 to 27 May 2009 in Ljubljana with 31 participants from 22 NMIs. 13 oral presentations and 12 posters on the developments in the field were given by the participants. In addition the on-going comparisons were discussed and a round table discussion (new CMC guides, equipment list, availability of high voltage amplifiers and availability of thermal converters) was held.

### **5.3 SC “Power and Energy”**

Convenor: G. Rietveld, VSL

- The SC has held its first meeting from 15 to 16 October 2009 at BEV, Vienna, in connection with the iMERA-Plus “Power and Energy” project meeting. The meeting was attended by 35 experts. A total of 15 technical presentations were given; the running comparisons in the field

were discussed and new ones were proposed. Tutorials on primary power systems and on power quality were given.

#### **5.4 SC “Radio Frequencies and Microwave”**

Convenor: Z. Svetik, MIRS/SIQ

- The SC meeting took place from 11 to 12 May at SP, Boras. It gathered experts from 14 NMIs. Beside the 9 technical talks, the running comparisons, the revision of the oscilloscope calibration guide and the extension of the CMC classification scheme were discussed.
- A brainstorming meeting in preparation for the EMRP call in 2010 was held in Torino from 13 to 14 October 2009. Potential research topics for the TP industry were identified.

### **6. Participation in the EMRP**

The TC-EM community was involved in the elaboration of proposal for the following selected research topics (out of 16):

- SRT 03: Metrology for Energy Harvesting
- SRT 04: Metrology for Energy Saving in Electronic Devices and Electrical Machines
- SRT 05: Metrology For Improved Power Plants
- SRT 06: Metrology for Fuel Cells
- SRT 09: Metrology for Solid State Lighting
- SRT 14: Metrology for Smart Electrical Grids
- SRT 15: Metrology for High Voltage Direct Current (HVDC)

Five of the seven proposals were selected for funding.

### **7. Meetings**

The annual meeting of the TC-EM was held in Delft (NL) on 29 and 30 October 2009. The meeting was hosted by the Van Swinden Laboratory (VSL). It was attended by 31 delegates representing 26 EURAMET members, one corresponding applicants (Albania) and the BIPM. The main topics of the agenda were:

- Reports on new developments within EURAMET, the BIPM electricity section and the activities of the four TC-EM subfields
- Report on the status of the EMRP; presentations on the running iMERA-Plus projects e-Mass, REUNIAM, JoSY, ULQHE, Nanospin, Power & Energy and EMF & SAR; strategy of the TE-EM for the 2010 calls “metrology for industry” and “environment”.
- Review of ongoing and new projects
- Discussion of the on-going inter-RMO of submitted EURAMET CMCs; adoption of improved procedures for the intra-RMO review
- Technical talks on: Progress on AC Josephson measurements and; dielectric constant of SAR fluids
- News from NMIs in form of short presentations and a poster session.

### **8. Outlook for 2010**

#### **8.1 Special activities**

- Collection of topics for the TPs “Metrology for industry” and “Environment” in the framework of the Art.169-EMRP.

## **8.2 Meetings**

- TC-EM: 28 to 29 October 2010, Espoo, hosted by MIKES, Finland
- Working group on strategic planning: 27 October 2010, Espoo, Finland
- DC /Quantum Metrology subfield:
  - Informal meeting, 12 June 2010, satellite meeting of the Conference of Precision Electromagnetic Measurements (CPEM), Korea
- Power and energy subfield:
  - in connection with a regular meeting of the iMERA-Plus JRP “Power and Energy”, October 2010

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for Electricity and Magnetism