

19 May 2009

1. General Aspects

Due to the very broad scope of the electricity and magnetism field, the technical work in the TC-EM is mainly carried out in the subcommittees. The TC-EM itself is more concerned with strategic issues, the planning of the projects and the MRA work.

The electrical metrology community within EURAMET is heavily involved in the iMERA-Plus joint research projects. As a consequence, the number of classical EURAMET research projects is declining. As there is still a need for collaboration outside the EMRP, this development needs special attention in the coming years.

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.

	Comparison	Consultation	Co-operation & research	Traceability	Total
On-going	21 (22)	2 (4)	5 (6)	10 (9)	38 (41)
Completed	63 (58)	56 (51)	41 (40)	2 (2)	162 (151)
Total	84 (80)	58 (55)	46 (46)	12 (11)	200 (192)

(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 is about to occur. 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, 16 (22) (number in brackets: previous period) EURAMET key or supplementary comparisons (5 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 29 (26) SCs. Besides this, EURAMET is or has been active in a large number of CCEM comparisons: 9 BIPM KCs, 48 CCEM KCs and 2 CCEM SCs.

4. CMCs

4.1 EURAMET EM CMCs

To make the CMC process within the TC-EM more efficient, a fixed timetable for the submissions and the review of CMC entries was introduced. CMs can be submitted on a yearly basis. The deadline for submission is the date of the TC-EM meeting in October. The first review according to this new scheme started in October 2008. The set comprises 571 new or modified CMC entries from 15 NMIs. The inter-RMO was completed on 13 March 2009.

4.2 Inter-regional review of CMCs

On 17 January 2008, APMP posted the CMC set APMP.EM.6.2008 on the JCRB web-site. The set comprised 460 CMC entries from 8 NMIs. The TC-EM reviewed a sample of 198 entries of the set and submitted the review report at end of May 2008.

The set COOMET.EM.3.2008, comprising 16 entries from Ukrmetrteststandard, Ukraine, was reviewed and the review report uploaded on the JCRB web-site in Nov. 2008.

The set COOMET.EM.4.2008, comprising 14 entries from NSC "Institute of Metrology", Ukraine, was reviewed and the review report uploaded on the JCRB web-site in May 2009.

The set SIM.EM.3.2009, comprising new and modified entries from 3 NMIs, will be reviewed until end of July 2009.

4.3 Peer review

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

- LNE, France
- EIM, Greece
- NML, Ireland (peer review organised in connection with the annual TC-EM meeting)

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 New SC "Power and Energy"

Ensuring a consumer oriented, reliable and sustainable energy supply in the face of deregulated markets and increasingly scarce and expensive resources reflects one of the major challenges faced by society. In this context the metrology in the field of electrical power and energy gains on importance. It was the opinion of the TC-EM, that the metrological needs of this field should best be addressed in a new SC. An extension of the scope of an existing SC was not a real option as there is little overlap (people and topics) between the power and energy field and the other sub-fields within the TC-EM.

During its meeting in October 2008, the TC-EM, thus, decided unanimously to propose to EURAMET a new SC "Power & Energy".

The proposition was accepted by the EURAMET delegates in December 2008.

As the first SC convenor, the TC-EM nominated Dr Gert Rietveld, TC-EM contact person of the VSL, Netherlands.

5.2 Scope of the SCs

The scope of the SCs was adapted and fixed as follows:

- SC 1: Electrical quantum standards
quantum standards and scales for voltage, current and resistance, metrological triangle, spintronics, nanomagnetism
- SC 2: Low frequency
AC/DC transfer, AC voltage and current, impedance (R, L, C)

- SC 3: Power and energy
Power and energy, high voltage, high current, transducers, instrument transformers, magnetic measurements
- SC 4: RF and microwave
RF and MW metrology, time domain and frequency domain measurements, EM fields, THz metrology.

5.3 Activities

The SCs meet on a bi-annual basis. The next regular meetings are planned for 2009 (see Sect. 9.2). In 2008 the SC 1 and 2 met informally during the Conference on Precision Electromagnetic Measurements (CPEM), held in Broomfield CO, USA, 8 to 13 June 2008, where new technical developments were discussed.

6. Participation in iMERA-Plus

The TC-EM community is involved in seven Joint Research Projects (JRP) selected for funding in the iMERA-Plus frame. The list of projects is given in the table below.

Nmb.	JRP ref.	Short name	Title
1	T1.J1.1	e-MASS	Watt balance
2	T1.J1.3	REUNIAM	Redefinition of the SI base unit ampere
3	T4.J01	Power & Energy	Next generation of power and energy measuring techniques
4	T4.J03	JOSY	Next generation of quantum voltage systems for wide range applications
5	T4.J07	EMF and SAR	Traceable measurement of field strength and SAR for the Physical Agents Directive
6	T4.J04	ULQHE	Development of ultimate metrological QHE devices
7	T4.J02	NanoSpin	Nanomagnetism and Spintronics

All the projects have started successfully and are –according to the first progress reports- well on track.

7. Meetings

The annual meeting of the TC-EM was held in Dublin (IE) on 16 and 17 October 2008. The meeting was hosted by the National Metrology Laboratory (NML). It was attended by 38 delegates representing 29 EURAMET members, three corresponding applicants (Albania, FYR Macedonia and Montenegro) 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 three TC-EM subfields
- Report on the status of the EMRP; detailed presentation of the JRP “Power&Energy”; discussion of ideas for possible JRPs in the planned TP “Energy” in the Art.169-EMRP.
- Review of ongoing and new projects
- Decision on the scope of the new SC “Power&Energy” and adoption of the formal proposal to the EURAMET GA
- Decision on a new working group on strategic planning and its terms of reference

- Organisation of the new intra-RMO CMC review; adoption of a proposal to extend the CMC classification scheme
- Technical talks on: the treatment of multidimensional measurement uncertainties, and about nanostructured magnetic materials for on-chip power conversion
- News from NMIs

8. Strategic planning

The new working group for strategic planning has started its activities. The main tasks are:

- to collect information regarding the long-term development of metrology in electricity and magnetism (EM);
- to identify future needs for metrology in the EM field and to identify and promote opportunities for collaboration;
- to support and to act for the appropriate participation of the EM community in the European Metrology Research Programme;
- to review the organisation and the activities of the TC-EM and to propose plans for its future development;
- to review the status of the EURAMET TC-EM key and supplementary comparisons and to plan future comparisons.

The terms of reference of the group were adopted by the TC-EM during its October 2008 meeting. One of the first tasks of the group is the preparation for the targeted programme (TP) “Energy” which is planned as the first TP in the Art.169 EMRP. The TC-EM intends to submit ideas for topics for this TP.

9. Outlook for 2008/2009

9.1 Special activities

- Collection of topics for the TP “Energy” in the framework of the Art.169-EMRP

9.2 Meetings

- TC-EM: 26 to 27 October 2009, Delft, hosted by VSL, The Netherlands
- Working group on strategic planning: 25 October 2009, Delft, Netherlands
- DC /Quantum Metrology subfield:
 - 2 to 5 June 2009, LNE, Paris
- LF subfield:
 - 25 to 27 May 2009, MIRS/SIQ, Ljubljana
- Power and energy subfield:
 - in connection with a regular meeting of the iMERA-Plus JRP “Power and Energy”, October 2009
- RF and microwave subfield:
 - 11 to 12 May 2009, SP, Borås, Sweden

Wabern 19 May 2009

Beat Jeckelmann
Technical Committee Chairman
for Electricity and Magnetism