TC-Chair Annual Report 2014
TC-MC

Date 30 January 2015

1. General Aspects

The work of the Technical Committee for Metrology in Chemistry, TC-MC, continues in its well-established form. The TC-MC members are actively participating in the European programmes dealing with metrology, i.e. the European Metrology Research Programme (EMRP) and the European Metrology Programme for Innovation and Research (EMPIR).
The seventh meeting of EURAMET TC-MC was held in Teddington, Great Britain, jointly hosted by NPL and LGC, from 3rd to 7th February 2014. All the four Sub-Committees (SCs) had separate meetings on the 5th of February and the TC-MC plenary meeting was held on 6th–7th February. About 80 representatives from various European NMIs/DIs participated in these meetings. Two extra days on 3rd and 4th February 2014 were reserved for the periodic meetings of EMRP projects.
Running EURAMET and EMRP projects were discussed in detail. Possible topics for the upcoming EMPIR call on "Industry" were presented.
Nilgün Tokman (UME) was nominated as the new convenor of the Sub-Committee for Inorganic Analysis (SCIA) in the plenary meeting. She replaces Paola Fisicaro (LNE), who ended her second mandate of Convenor and had acted as the Convenor of SCIA for four years. Hugo Ent (VSL) was reappointed for a second two-year mandate as Convenor of the Gas Analysis SC (SCGA).

2. Projects

Many EURAMET projects are currently active. Most of all are comparisons and mainly carried out in the field of gas analysis. Detailed information on the projects is given in the TC-MC project webpage. In 2014 2 comparisons were concluded and 7 started or proposed.

Year	project started	completed projects
2003	5	4
2004	4	3
2005	5	4
2006	8	3
2007	4	4
2008	4	3
2009	3	3
2010	3	4
2011	9	8
2012	-	1
2013	2	3
2014	7	2

3. Comparisons

9 EUROMET.QM Supplementary Comparisons and 7 Key Comparisons are registered in the BIPM KCDB:

EUROMET.QM-K1.c: completed
EUROMET.QM-K3: completed
EUROMET.QM-K4: completed
EURAMET.QM-K4.1: completed
EURAMET.QM-K12: completed
EUROMET.QM-K17: completed
EURAMET.QM-K26.a: completed
EUROMET.QM-S1: completed
EUROMET.QM-S2: completed

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EUROMET.QM-S3: completed
EURAMET.QM-S4: completed
EURAMET.QM-S5: completed
EURAMET.QM-S6: completed
EURAMET.QM-S7: completed
EURAMET.QM-S8: completed
EURAMET.QM-S9: completed

About the 80% of such comparisons is carried out in the gas field.

4. CMCs

In 2014, a review of new claims as well as a re-review of a range of existing claims was carried out in the regional CMC review process under cycle XV of the CMC claim period. The files and accompanying documents were received by the relevant TC-MC SC convenors and discussed and evaluated by the SCs and appointed reviewing experts from different European NMIs/DIs, already prior to the meeting. The evaluation was completed during Sub-Committee meetings on 5th February 2014. 77 new and 143 revised and re-reviewed claims (22 of which were withdrawn) have been proposed by 16 NMIs and DIs from 14 countries covering 12 categories (from 1 to 12). In addition, 14 claims to be re-reviewed, coming from 2 Institutes, did not pass the intraregional review hence they were greyed out.
The collated claims from all the subcommittees were sent to the chairperson of the CCQM KCWG on the 14th of February 2014, according to CCQM rules, for the inter-regional review.
During the interregional review, the claims were divided into Fast Track and Non Fast Track ones and only 1 EURAMET claim was put among the Non Fast Track ones. 198 EURAMET Fast Track claims (76 new and 121 revised) were published in the KCDB in June 2014. The remaining EURAMET Non Fast Track claim (new) was published in the KCDB in November 2014.
EURAMET experts also took part in the inter-regional review process leading to the publication in the KCDB of 294 Fast Track claims from AFRIMETS, COOMET, APMP and 116 Non Fast Track claims from COOMET, SIM, APMP.

5. Activities of the Sub-Committees

Meetings of all Sub-Committees were conducted together with the TC-MC plenary meeting in Teddington in the week from 3rd to 7th February 2014.
A review of new claims as well as the obligatory re-review of a range of existing claims were carried out under cycle XV of the CMC claim period.
Running and new projects in the framework of EURAMET and EMRP and also proposals for the upcoming EMPIR call on “Industry” were discussed in detail in all sub-committees.
Periodic meetings of the JRPs ENV05 “OCEAN-Metrology for ocean salinity and acidity”, ENV08 “WFDtracebility – Traceable measurements for monitoring critical pollutants under the European Water Framework Directive (WFD-2000/60/EC)”, SIB09 “ELEMENTS - Primary standards for challenging elements” and HLT05 “Metallomics – Metrology for metalloproteins” were carried out on 3-4 February in Teddington prior to the TC-MC meeting.
An overview of the technical work carried out in the four SCs is reported.
SC for Electrochemical Analysis (SCEA)
In the SCEA a great issue dealt with the presentation and discussion of the results of the EURAMET project n. 1271 “Electrolytic conductivity at pure water level”, registered in the BIPM KCDB as Supplementary Comparison EURAMET.QM-S7, having 4 participants: PTB (coordinator), DFM, SP and CMI. Two participants in the comparison proposed a traceability chain which is not linked to the SI units. Various members of the SCEA are successfully taking part in EMRP projects.
SC for Inorganic Analysis (SCIA)
A large part of the technical work in SCIA is at presents concentrated on ongoing EMRP projects. A particular attention is also given to the way of disseminating traceability in the inorganic analysis field. The outline of various JRPs that had not had their meetings during the TC-MC event was given during a joint meeting of the SCIA and SCEA.
SC for Organic Analysis (SCOA)

In the SCOA is considered to be of vital importance to be proactive and to arrange EURAMET activities that complement OAWG activities. The determination of organic priority pollutants in water is a key issue for the work of the SCOA and the determination of TBT, PAHs and PBDEs in whole water can be the object of a future measurement comparison to be dealt within the framework of the EMRP project ENV 08 “WFDtraceability - Traceable measurements for monitoring critical pollutants under the 'European Water Framework Directive' (WFD- 2000/60/EC)”. Another area of interest is the clinical chemistry, where a comparison on creatinine could be planned.

SC for Gas Analysis (SCGA)

The SCGA is very active in various EURAMET projects, some of them also registered as EURAMET Supplementary or Key Comparisons in the KCDB. Its activities involve also many participants from outside Europe. 11 active projects were discussed during the meeting.

- EURAMET 708 is an ongoing bilateral comparison between VSL and NIST dealing with different challenging analytes, like NH_3 and HCl. Future comparisons on H_2S and VOCs are planned for 2014.
- EURAMET 1183 (NPL), registered also as Key Comparison EURO.QM-26a, deals with NO in N_2 at 450 nmol/mol level. Participants are IPQ, LNE, INRIM, METAS, MIKES-FMI, BEV-UBA, JRC-IES. The final report was approved by representatives from CCQM GAWG.
- EURAMET 1212 (SMU) is a comparison on natural gas, also registered as Key Comparison EURO.QM-K16. The comparison standards are synthetic natural gas mixtures (C_1-C_6, N_2, CO_2) prepared by SMU. The other participants are CMI, VSL, INMETRO. Considering that the concentrations of the analytes differ from CCQM-K16 it was proposed to change it into a supplementary comparison, adapting also the HFTLS statement.
- EURAMET 1112 (PTB) is a comparison on ethanol in water saturated air with the purpose of comparing the realisation process of mixtures to be used in the breath ethanol analysis. PTB, BEV, GUM, INM, LNE, BIVV/IBSR (BE) are participating in the study.
- EURAMET 1220 (NPL) is a project for the analysis of trace level impurities in hydrogen used in fuel cells; the protocol and time scheduling was presented. It deals with the following mixtures 100 nmol/mol CO in H_2, 1 µmol/mol CO in H_2 and 1 µmol/mol H_2S in H_2.
- EURAMET 1244 (NPL) “Aerosol electrometer comparison“ and EURAMET 1282 “Condensation particles counters“ are both dealing with instruments to measure particle number concentration. This is a particular issue as the measurement of aerosol particle number concentration has become part of the vehicle emission regulations and is also studied as part of the EMRP project ENV02 (PartEmission). They are both coordinated by NPL and have the same participants.
- EURAMET 1255 deals with coal mine methane and is coordinated by BAM.
- EURAMET 1274 is a bilateral comparison between SMU and MKEH on automotive mixtures.
- EURAMET 1280 (PTB) deals with establishing the equivalence of TILSAM and gravimetry-based analytical capabilities. By means of TILSAM, absolute spectroscopy is used to assign amount fractions to species in gas mixtures without direct reference to calibration gas mixtures. The performance of this method, used by at least two participants, shall be compared to the established methods in gas metrology performed by, at least, two other participants. There are 5 participants at the moment (PTB, CENAM, DFM, IPQ and BAM) but the project is still open for other participants.
- EURAMET 1258 “Guidelines for CMC”, which concentrates on a document that clarifies existing guidelines for setting up CMCs and to specify for a couple of scenarios what supporting evidence is to be delivered, e.g., extension of ranges, extension of range of components, claims for purity analysis, smaller uncertainties and guidance on CRMs with reference to existing CCQM GAWG documents. PTB, LNE, METAS, NPL and VSL are currently involved.

Four new projects were also proposed:

- a comparison on 5 µmol/mol of oxy-VOCs, having for the moment only NPL and VSL participating but still open for other participants;
- EURAMET 1293 (NPL) on the C_6 - C_{10} hydrocarbons in methane, having NPL and VSL as participants; EURAMET1290, also registered as EURAMET.QM-K111, dealing with C_3H_8 at 1000 µmol/mol in N_2, This last one is a core comparison and the first of an organized linked key comparison with regional comparisons. From each RMO there are only 2 participants in the CCQM KC and one of those has to organize the regional comparison. For EURAMET VSL and NPL will participate in the KC and VSL will organize both the CCQM and the EURAMET KCs. Participants are UME, GUM, MKEH, CEM, METAS, LNE and VSL. Registration is possible until August 2014.
- EURAMET 1305, a bilateral project between VSL – NPL aiming at having an ongoing series of comparisons to assess the validity of novel calibrations and measurements and to address branched C_6 – C_7 alkanes in methane

6. EMRP and EMPIR

The ongoing European Programmes EMRP and EMPIR represent a very important factor in the work and prospect of the TC-MC.
TC-MC has been strongly involved in the EMRP process and participates in about 15 running projects in all the EMRP fields, i.e. “Health”, “Energy”, “Metrology for environment”, “Metrology for industry”, SI broader scope, “New technologies”, indicating the cross-disciplinary nature of the TC itself.
Chemical aspects related to the upcoming EMPIR calls “Industry” were addressed during the TC-MC plenary meeting. The following ideas for research topics were presented and discussed:

- “Metrology for water quality monitoring sensors” (LNE)
- “Metrology to support portable and transportable devices” (LGC)
- “Need for detection and characterisation methods for nanomaterials in complex sample” (LGC)
- “Industrial bioprocessing – Quality by design: Critical quality attributes” (LGC)
- Metrology for advancing the performance and lifetime of organic electronics (NPL)
- Passivation of cylinder walls, transfer lines and regulators (VSL)
- Portable gas flow standards (VSL).

7. Meetings

TC-MC annual meeting 2014:

3rd to 7th February 2014 (Sub-Committees and TC-MC plenary meeting) in Teddington, Great Britain.

Highlights:

Reports on:

- A strategic overview of EURAMET
  Kamal Hossain, *EURAMET Chairperson*
- Relevant CIPM, BIPM and JCRB issues and CCQM February 2014 update
  Robert Kaarls, *CIPM Secretary and Immediate Past President of CCQM*
- Opportunities of EMPIR for R&D and towards European Metrology Centers
  Joern Stenger, EURAMET vice-chair, Bernd Guettler, PTB (Germany)
- EURAMET Task Groups “Health” and “Environment
  Hans Koch, Convenor of the TG Health, Andrea Merlone, Convenor of the TG Environment
- CCQM Strategy Update and BIPM 2016-2019 Programme in Metrology in Chemistry
  Robert Wielgosz, Head of BIPM Chemistry Department
- Eurachem 25 years – looking back and forward
  Bertil Magnusson, SP (Sweden), EURACHEM Chair
- Chemical Metrology Working Group – Where are we now and where do we want to go
  Stephen Wise, SIM Chemical Metrology WG Chair
- CCQM WG activities
  Representatives of the 6 technical CCQM WGs

Next meeting:

TC-MC annual meeting 2015:

- 3rd- 6th February 2015 (sub-Committees and TC-MC plenary meeting) in Malta, hosted by MCCAA.

8. Issues

- Re-review process of existing CMCs exceeding new CMCs
- Need to organise new comparisons to support CMCs based on old KCs
- Need to organise new comparisons in emerging fields

- Involvement of emerging NMIs/DIs in comparisons
- Coordination of metrological infrastructure at the national levels: cooperation between NMIs and DIs
- Communication with TC-Q: need to assure that the QMS of the NMIs/DIs are in place and covering the claimed CMCs.

9. Strategic planning

- Discussion about participation in future EMPIR projects
- Discussion about CMC activities
- TC-MC contribution in the development of EURAMET Strategic Research Agenda

10. Outlook for 2015

- Discussion for the participation in future EMPIR activities
- Activities related to CMC submission and revision.
- Formalisation of EURAMET TC-MC representatives in the CCQM KCWG
- Participation in the EURAMET Task Groups
- Representation of the bioanalysis community in the TC-MC Subcommittees
- Give advice to TC-Q for the identification of sound criteria for i) the use of ISO Guide 34 in QMS review, ii) a better distinction between testing and calibration activities.

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