

24 January 2011

---

## 1. General Aspects

The TC-T, besides the original Thermometry Subject Field, includes since 2002 the Humidity Sub-Field. Two years ago, the TC-T started an “approach path” to the thermophysical properties community with the goal of understanding whether a new Subfield on Thermophysical Properties should be established within the TC-T. This approach is in line with the CIPM policy, as the CCT already established a Working Group on Thermophysical Properties with the goal of conducting pilot studies to assess the maturity and the need of key comparisons in this field. Prompted by the same intentions, in 2010 the TC-T organized a Workshop on Thermophysical Properties and, given the success of the workshop, decided to establish a Working Group on “Metrology for Thermophysical Properties”.

As consequence the TC-T has now four active WGs:

- The WG on CMC Review (established in 2000)
- The WG on Strategy (established in 2009)
- The WG on Best Practice (established in 2009)
- The WG on Metrology for Thermophysical Properties (established in 2010)

Since 2009, the annual TC-T meeting is structured in two days as follows:

- Half a day dedicated to the Humidity Subfield
- Half a day dedicated to common issues (BIPM news, EURAMET news, EMRP calls, reports of the WGs)
- Half a day dedicated to the Thermometry Field
- The afternoon of the second day is dedicated to the visit of the laboratories of the hosting institute.

## 2. Projects

The status of all the projects can be viewed on the TC-T webpages. Nevertheless, apart from few exceptions, the TC-T webpages reflect the status of the projects at the previous annual TC-T meeting (April 2010), when progress reports were submitted by all project coordinators. An up-to-date overview of the status of all the projects will be available after the coming annual TC-T (end of March 2011), after receiving the annual progress report from the project coordinators.

## 3. Comparisons

All EURAMET comparisons in thermometry and humidity are formally handled as EURAMET projects and their status can be viewed on the TC-T webpages (see above). Concerning the status of the most relevant key comparisons:

- EURAMET.T-K6 (project 621): first European regional key comparison in the field of humidity (dew-point temperature range -50°C to +20 °C) was completed and published in the Technical supplement of Metrologia in September 2010.
- EURAMET.T-K8 (project 717): key comparison in the dewpoint temperature (high range, 30°C to 95 °C) was initiated.
- “New CCT-K3”: CCT key comparison ITS-90 calibration of SPRTs from Ar to Zn, including 5 EURAMET participants, was initiated.

## 4. CMCs

The review of EURAMET CMCs is performed cyclically (yearly) by a team of EURAMET experts (two experts for each group of services), coordinated by the chairman of the WG on CMC Review. A review protocol for each group of services was implemented by the CCT WG8 to guide the reviewers on the review and to guarantee a harmonized, scientifically based, CMC review and acceptance across all RMOs. Still the CMC review process remains time-consuming and sometimes non-converging to acceptance. The progresses made in the past year are:

- Revised Radiation Thermometry Review Protocol approved and applied (first turn of review completed).
- Relative Humidity Review Protocol approved and being applied (first turn or review undergoing)
- 2010 CMC Review Cycle initiated (but not completed).

## 5. Activities of the Sub-Committees

Currently the TC-T counts only one Sub-Committee, the Humidity Sub-Committee, established in 2002. Its members meet at the annual TC-T meeting, having half a day session fully dedicated to the humidity field and another half day joint session with the thermometry community for common issues (news from BIPM, EURAMET GA, EMRP...). A new Convenor (Vito Farnicola, INRIM) was appointed by the EURAMET chairman in December 2010, after the resignation of Anton Steiner (METAS), which moved to a different field following an internal re-organization at METAS.

The EURAMET Humidity Sub-Committee is very active within EURAMET in co-operation and traceability research projects, production of best practice documents, organization of training courses and has a prominent role in the inter-RMOs Key Comparisons.

## 6. Participation in the iMERA Plus/EMRP

The TC-T community is participating in various iMERA Plus/EMRP projects. The most relevant contributions in the past year are:

- iMERA Plus project on “Determination of the Boltzmann constant for the redefinition of the Kelvin”, coordinated by PTB, close to completion (to be finalized March 2011)
- WP3 and WP4 of ENG01 GAS “Characterization of Energy Gases” (“New primary and reference humidity facilities”) reported progress and achievements during the first 6 months of the project.
- IND01 “High Temperature Metrology for Industrial Applications (>1000°C)”, HiTeMS, coordinated by NPL, selected for funding (was ranked first of all submissions) in Energy Call 2010. Contract negotiations already initiated.
- “Metrology for Pressure, Temperature, Humidity and Airspeed in the Atmosphere” selected for funding in Energy Call 2010. Contract negotiations already initiated.

Concerning the EMRP Calls 2011, the Strategy WG of the TC-T has already collected ideas for potential research topics within the TCT. The list of PRT ideas will be distributed to all TCs to promote multidisciplinary approach.

## 7. Meetings

The following meetings were held in the past year:

- Workshop on Metrology for Thermophysical Properties, Thessaloniki, 14<sup>th</sup> April 2010
- Annual TC-T Meeting, Thessaloniki, 15<sup>th</sup> -16<sup>th</sup> April 2010
- Meeting of the WGs on Strategy, Best Practice and CMC Review, Thessaloniki, 14<sup>th</sup> to 16<sup>th</sup> April 2010
- Meeting of the WG on Metrology for Thermophysical Properties, , Portoroz, 31<sup>st</sup> May 2010
- Meeting of the WG on Strategy, Portoroz, 1<sup>st</sup> June 2010
- New Kelvin Dissemination Workshop, Teddington, 27<sup>th</sup> – 28<sup>th</sup> October 2010

The coming annual TC-T Meeting will be NPL in Teddington, 31<sup>st</sup> March to 1<sup>st</sup> April 2011. This will be preceded, on the 30<sup>th</sup> March, by a roadmapping of the three technical areas encompassed by the TC-T.

## 8. Issues

In the past year the following issues arose for which the action of the BoD/GA is requested:

1. **Terms of reference for the TC-T and for its WGs:** In analogy with the CCT and its WGs, the TC-T WG on Strategy decided to establish its Terms of Reference (ToR) and, in doing that, it could not avoid to make reference to the objectives of the TC-T. As the TC-T has no specific ToR, the WG on Strategy prepared a proposal for the ToR of both the TC-T and its WG on Strategy. ToR have to be in line with the “Objective and Scope of the TCs” defined in the EURAMET RoP and have to be approved by the GA. The TC-T proposal was submitted to the EURAMET chairman in June 2009 and since then the TC-T is waiting for the feedback from the EURAMET Chairman/GA.
2. **Calibration Guides and “Technical Guides”:** in 2010 the TC-T prepared and approved the EURAMET publication “Technical Guide on extrapolation of SPRT calibrations below the triple point of argon”. Following a procedure settled during the preparation of the previous TC-T EURAMET publication (“Calibration Guide on climatic chambers”, published in November 2010), the document was prepared in co-operation with the EA Laboratory Committee but, being a new type of EURAMET publication, it needs approval from BoD/TCC to be published.
3. **CMC Review Process:** in spite of all the efforts made in harmonizing the CMC submission, review and acceptance, the process still remains very time-consuming and sometimes not-converging to acceptance. The reviewers are typically the most experienced metrologists and, because of that, also the most engaged. The radiation thermometry review seems to indicate that regional compari-

sons are needed to support the claimed CMCs. This will be discussed at the CMC Review Group Meeting to be held in Teddington on 31<sup>st</sup> March.

## **9. Strategic planning**

The Working Group on Strategy is in charge of the strategic planning of the TC-T. The main activities in which the WG on Strategy performs its strategic planning role are:

- Identify and recommend capability developments and research priorities within the ambit of the TC-T
- Encourage collaborative projects fostering ever closer cooperation and links between the EURAMET NMIs/DIs.
- Fostering effective liaison with other RMOs in technical areas of mutual benefit
- Generation and revision of roadmaps for its core technical areas (temperature, humidity and thermophysical properties)
- Support active participation in the EMRP
- Recommend to the TC-T appropriate regional KCs in support of CMCs
- Support training of staff in key measurements skills
- Act as a conduit of information flow between the CCT Strategy Group and the EURAMET TC-T.

Specifically, in the past year, the following actions were taken:

- Plan and organize (venue, participants invitation) the revision of the roadmaps for Thermometry, Humidity and Thermophysical properties (Teddington, 30<sup>th</sup> March 2011).
- Collect ideas for potential research topics of the EMRP Calls 2011.
- Assess the maturity of the thermophysical properties field and propose the establishment of a Working Group on “Metrology for Thermophysical Properties” within the TC-T.

## **10. Outlook for 2011/2012**

The major objectives of the coming year are:

- EMRP Calls 2011: collect ideas for potential research topics (particularly for TP SI Broader Scope), identify PRTs and coordinate their submission
- Revision of roadmaps for Thermometry, Humidity and Thermophysical Properties, 30<sup>th</sup> March, Teddington
- TC-T Annual Meeting in Teddington, 31<sup>st</sup> March – 1<sup>st</sup> April 2011
- Continued effort in CMC review process
- Begin process for radiation thermometry comparison in support of CMCs