

WORKING GROUP 8 REPORT TO CCT: May 2008

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Terms of Reference:

- ◆ to establish and maintain lists of service categories and, where necessary, rules for the preparation of CMC entries;
- ◆ to agree on detailed technical review criteria;
- ◆ to coordinate and, where possible, conduct inter-regional reviews of CMCs submitted by RMOs for posting in Appendix C of the MRA;
- ◆ to provide guidance on the range of CMCs supported by particular key comparisons;
- ◆ to examine the sufficiency of existing comparisons for supporting CMC submissions and to recommend new comparisons where deemed necessary; and
- ◆ to coordinate the review of existing CMCs in the context of new results of key and supplementary comparisons.

Working Group 8 is tasked to continue with the creation of CMC review protocols and the review of fast-track CMC submissions for inclusion in Appendix C, along with the identification of new comparisons needed to support CMC submissions.

Overview of WG8's Activities:

Since the last CCT meeting in 2005, WG8 has met yearly. Between the two meetings in 2006 and 2007, the WG carried on review of submitted CMCs via the BIPM Discussion Forum.

In Fall 2006, the WG met at NIST for a three day meeting to complete CMC review protocols for Industrial Thermometers, the TPW cell, and ITS-90 subrange calibrated SPRTs. Additionally, a WG8 Expectation document was created. All of these documents are available on the BIPM CCT WG8 Open Access webpage (<http://www.bipm.org/wg/AllowedDocuments.jsp?wg=CCT-WG8>).

A brief summary of those three CMC review protocols and the expectation document are given below:

- ◆ Industrial Thermometers
 - Resistance, thermocouples, digitals, and liquid-in-glass
 - Algorithm based
 - No CCT WG8 level review in protocol
- ◆ TPW cells
 - 25th and 75th percentile values of K7 and CMC submissions
- ◆ ITS-90 Subrange calibrated SPRTs
 - Algorithms based on K3, K4, and non-uniqueness values
 - Maximum uncertainty must be given, however, linear interpolation between two values is allowed
- ◆ Four CCT WG8 Expectations
 - Satisfactory participation in or linkage to a KC
 - Unsatisfactory KC result requires explanatory documentation
 - KCRV is not used as baseline for a correction term
 - Technical responses to questions regarding “Under Review” CMCs expected with two months of initial request

In Spring 2007, the WG met during TEMPMEKO 2007 to review submitted CMCs from the RMOs and revisit "old" protocols to simplify and homogenize to the latest format used for the three protocols approved in Oct. 2006. This will make it easier for the user to interpret the protocol. Those three protocols are for

- ◆ SPRT fixed-points
- ◆ Humidity
- ◆ Radiation thermometry

Additionally, a CCT WG8 paper was presented at TEMPMEKO 2007 entitled "CCT WG8 CMC Review Protocols: Development and Implementation." A copy of this talk is found at http://www.bipm.org/wg/CCT/CCT-WG8/Allowed/CMC_review_protocols/CCT_WG8_CMC_Talk-TM07.pdf

A copy of the paper is found on the IJT website at <http://www.springerlink.com/content/51458448142027wr/fulltext.pdf>

The abstract of this paper is given below:

The primary objectives of the Consultative Committee on Thermometry Working Group 8 (CCT WG8) are to establish and maintain lists of service categories, to agree on detailed technical review criteria of submitted calibration and measurement capabilities (CMCs), and, where necessary, to develop rules for the preparation of CMC entries. One of the main tasks of CCT WG8 is the creation of harmonized CMC review protocols for thermometry and humidity that are scientifically based. The work of CCT WG8 is performed by the Regional Metrology Organization (RMO) Working Group on Thermometry chairpersons and invited technical experts. The CCT WG8 develops practical, pragmatic guidelines for CMC reviews that let the CMC review process proceed according to a set of objective numerical criteria and specified technical evidence to reduce the possibility of disagreement. The CCT WG8 CMC review protocols are designed so that CMC reviews are scientifically based and not designed to bluntly increase uncertainties. The CMC review protocols currently developed and accepted by CCT WG8 cover International Temperature Scale of 1990 (ITS-90) fixed-point cells, ITS-90 calibration temperature subranges for standard platinum resistance thermometers, industrial thermometers, radiation thermometry, and humidity. This article describes the methods used by the CCT WG8 committee to create the review protocols.

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In Spring 2008, the WG met during the CCT meeting week to discuss the following agenda:

- The status of each RMO with respect to
 - Upcoming CMCs for review
 - Upcoming CMCs for JRCB acceptance
 - List of ongoing or planned comparisons to validate CMCs
 - Other pertinent information or changes within your RMO
 - Specific needs of your RMO that we need to address
- Membership changes
- Classification of Services in Thermometry
 - Additions or modifications
- The status of two draft CMC review protocols
 - %RH
 - high-temperature fixed points
- Revisit of "old" protocols
 - Simplify and homogenize to the latest format used for the three protocols approved in Oct. 2006. This will make it easier for the user to interpret the protocol.
 - Remove references to provisional acceptance of CMCs
- Discuss Key Comparisons to recommend to the CCT

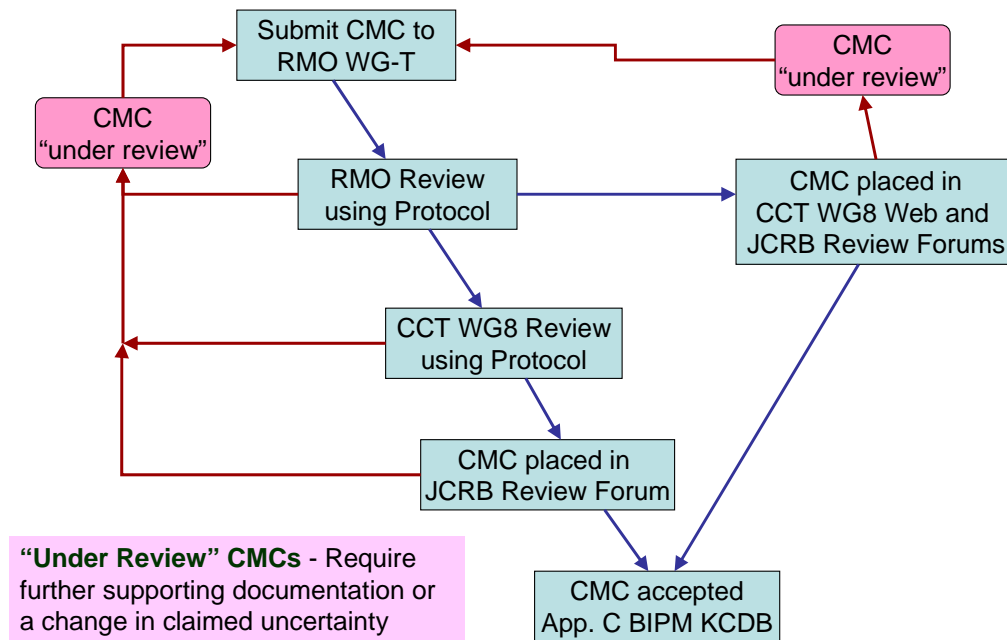
The results from the meeting included the following:

- Classification of Services were changed in
 - 2.8 Other measurement services
 - 2.8.3 Wires for melting-point measurements **for thermocouples**
 - 2.8.5 **Phase-transition temperature of reference materials**
- Based on the RMO status reports, we project that over 300 CMCs from the RMOs are to be submitted to the JCRB by the end of the year
- Drafts of new CMC review protocols were reviewed for relative humidity (%RH) and high temperature fixed points. Both review protocols are still in draft mode
- All RMOs are actively engaged in various comparisons for continued support of CMCs.
- Critical that RMOs register all of their comparisons on the KCDB
- PTB submitted CMCs for PLTS 2000 for which no review process yet exists special case that will not need a review protocol but will need a review by technical experts assigned by WG8
- Development of a new document outlining DUT uncertainty terms and their evaluation to harmonize CMC assessment coordinated with WG3
- WG8 confirmed that CMC traceable to SI not KCRV
- Note of thanks to both Janet Miles and Richard Davis for their support regarding the BIPM Discussion Forum
- K5 replacement: on discussions with Graham it was determined that no new comparison projected for 2 to 3 years
- Extension of K6 to 90 °C is the purview of WG6
- New K3 (K8)
 - SPRTs as transfer artifact, collapsed star, Ar to Zn, NIST agrees to Pilot, participation from each RMO limited to 20% of maximum number of available members or 3 – whichever is greater, and the need final clarification of who can participate
- New type of KC
 - test low uncertainties associated with fixed-point realization CMCs, transfer artifacts to be fixed-point cells, protocol needs to be written, logistics and measurement issues including equipment compatibility, pilots are needed to cover Ar, Hg, Sn and Zn (NMIA, NMIJ, UME, NIM, and INM agree to pilot)
- Next meeting planned for April 2009

CMC Status in KCDB:

Over 700 temperature and humidity CMCs are now on the KCDB with 38 NMIs represented.

In general, the WG formalized a flowchart to explain the NMI CMC submission, review and acceptance process.



Upcoming Membership Changes:

Jovan Bojkovski, RMO representative from EURAMET, will reach the end of his term in June 2008. Starting in June 2008, **Wolfgang Buck** will replace **Jovan** as the EURAMET representative on WG8.

Mark Ballico, RMO representative from APMP, will reach the end of his term in December 2008. His replacement to be named at a later date

The chair of WG8, as well as the other sitting members of WG8, formally thank both **Jovan** and **Mark** for all of their hard work over the past four years.