

**Consultative Committee for Time and Frequency
(18 and 19 September 2015)**

Report of the CCTF Working Group on the MRA (WGMRA)

J. Mauricio López-Romero, chairman

1 Introduction

The Term of the Reference of the WG on MRA:

- a. Authorization on a provisional basis for any action needed between meetings of the CCTF as indicated by the MRA, in consultation with the CCTF President;
- b. Perform coordination activities related to MRA between RMOs;
- c. Act as point of contact for BIPM and JCRB on MRA matters;
- d. Report actions to the next CCTF meeting, the CCTF revising the decisions as required;
- e. Identify areas where additional key comparisons and supplementary comparisons are needed, and develop necessary guidelines and procedures;
- f. Provide guidance on the range of CMCs supported by particular key and supplementary comparisons;
- g. Establish and maintain a list of service categories, and where necessary rules for the preparation of CMC entries;
- h. Agree on detailed technical review criteria;
- i. Coordinate the review of existing CMCs in the context of new results of key and supplementary comparisons.

The members are:

- a. Chairman : Dr J. Mauricio López-Romero (CENAM/CINVESTAV)
- b. Secretary: Dr Gianna Panfilo (BIPM)
- c. Chairpersons of the RMO technical committees for time and frequency;
- d. Experts from time laboratories : Dr Bruce Warrington (NMIA), Dr Erik Dierkx (VSL);
- e. Experts from the BIPM: Dr Gianna Panfilo (BIPM)

At the 19th CCTF in 2009 some important topics related to the Mutual Recognition Arrangement (MRA) implementation in the Time and Frequency field were discussed and some decisions were taken about the key comparison CCTF-K001, confirmed as the unique key comparison in this field, and about the way it has to be made available on the KCDB.

2 WG MRA meetings

The WG MRA meets once during the PTTI meeting in Bellevue, Washington the 4 December 2013. During the meeting the guidelines for GNSS equipment calibration were discussed. The other points of the agenda were i) the possible RMO comparisons or pilot projects in the field of the CCTF, ii) the information on the schedule for the time and frequency technical committees meetings at the RMOs, iii) the actions for the CCTF WG on MRA in the scope of the CCTF strategic planning and iv) the new publication of CCTF-K001.UTC in the BIPM Key Comparison Database.

3 Status of the CMCs for Time and Frequency

At August 2015, a total of 49 countries were listed in the KCDB as suppliers of calibration services for Time and Frequency divided as follows, according to the service classification (upper level) of WGMRA Guideline 1: Time scale difference 36 countries, Frequency 49 countries, Time Interval 40 countries.

The total of CMC's in Time and Frequency recorded in the KCDB are 738.

The dates of approval of these CMCs range from 2005 to 2015 and there is no information about any periodical review from the RMOs.

Some topics are clearly related to the activity of this WG and of the RMOs and were considered in reviewing Guidelines 5.

4 Key Comparison CCTF.K001.UTC

Following the decision taken at the CCTF 2012 a new publication of the degrees of equivalence between the key comparison results and the UTC(k) data is reported on the KCDB starting from March 2015.

5 New and revised guidelines proposed to the CCTF

A new guideline "Rules for the participation to the computation of UTC at the BIPM" has been prepared to clarify the difference of request for the National Metrology Institutes (NMIs), other Institutes located in a Member State of the BIPM or Associate to the CGPM and International organizations signatories of the CIPM MRA to participate to the computation of UTC.

The guideline "The prediction uncertainty" has been revised to refine results. This guideline is strictly related to the service category "Time scale difference – Local clock versus UTC" giving a model to compute the uncertainty in predicting the time error of two types of reference clocks (cesium and hydrogen maser) commonly used for a UTC(k) generation, over a time span of 20 days as is commonly found in the CMCs tables.

6 Documents

The CCTF WGMRA has been solicited on different topics concerning:

- CCTF criteria for obtaining traceability in time and frequency
- Actions for the CCTF WG on MRA in the scope of the CCTF strategic planning.
- Actions for the CCTF WG on MRA for the revision of the RMA

7 Proposed tasks for the 19th CCTF meeting

According to the duties assigned to the WGMRA and to the activities performed in this term, it is proposed to discuss and approve the following documents:

- New Publication of the Key Comparison CCTF.K001.UTC
- CCTF WGMRA Guideline 6 "Rules for the participation to the Computation of UTC at BIPM" 2015,
- CCTF WGMRA Guideline 5 "The prediction uncertainty" (revised),

8 Open issues

- a. Develop a guideline on the technical criteria for the CMCs review and their periodical evaluation,
- b. Collect regularly the information on regional RMO comparisons or pilot projects in the field of the CCTF;
- c. Establish a rule for a periodical evaluation of the degree of equivalence of the CMCs claimed by the NMIs and available in the KCDB.

Annexes

CCTF WGMRA Guideline 5 “The prediction Uncertainty” (Revised), 2015

CCTF WGMRA Guideline 6 “Rules for the participation to the computation of UTC at the BIPM” , 2015