CCTF/01-35

MRA implications on Time and Frequency field.

- EUROMET -

Scope of MRA

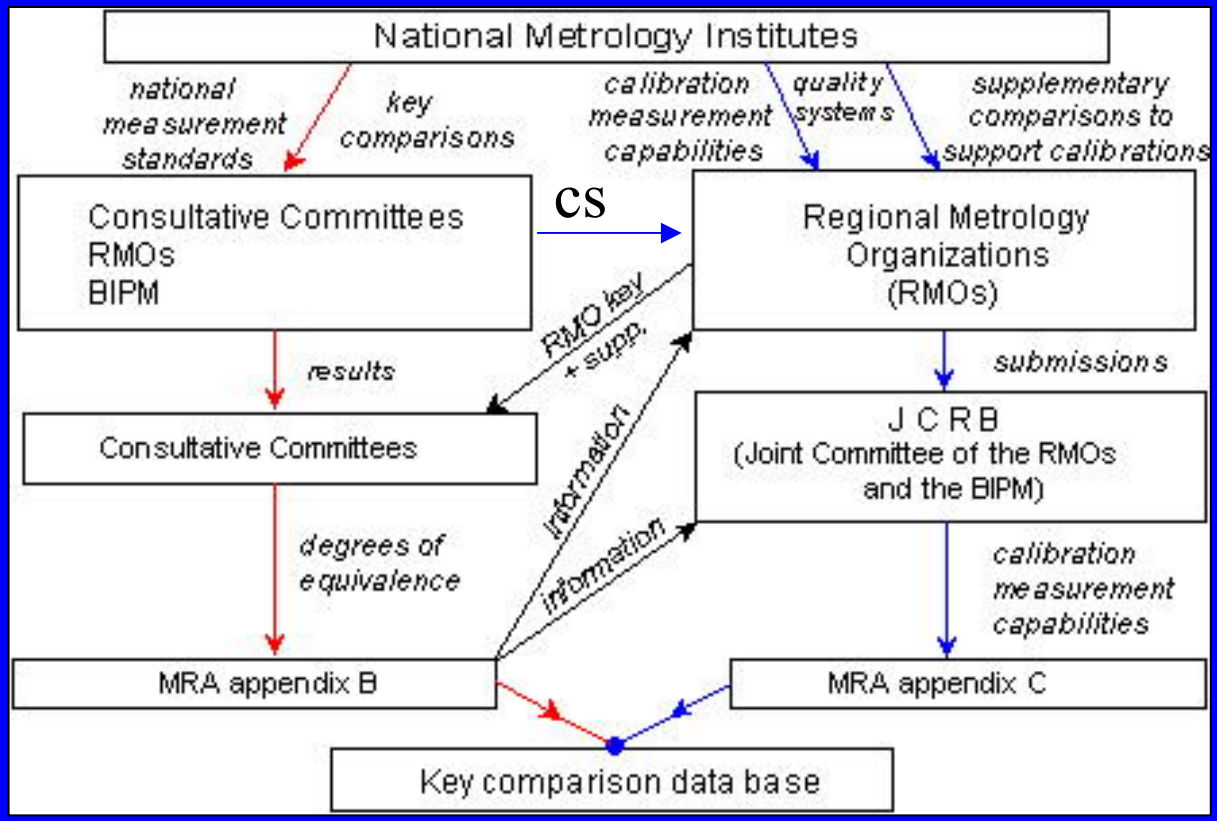
- NMIs recognize the **degree of equivalence** of national measurement standards, derived from results of KCs, for the quantities and values specified in App. B.

- NMIs recognize the **validity of calibration and measurement certificates** issued by other NMIs for the quantities and ranges specified in App. C

The process of MRA is:

- international comparisons of measurements, to be known as key comparisons;
- supplementary international comparisons of measurements;
- quality systems and demonstrations of competence by NMIs.

MRA scheme (Source BIPM)



Nomenclature of the key comparisons

Source: BIPM Web site

Field of measurements:
'TF' for Time and Frequency is not yet used since no key comparisons are defined in these fields.

Guidelines for CIPM key comparisons
1 March 1999

2. Types of key comparison

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A special case is the regular calculation of the time scales TAI and UTC by the BIPM. These are based on the results of a continuing series of clock comparisons carried out and interpreted following guidelines agreed by the CCTF. Equivalence of national time scales throughout the world is assured by the universal adoption of the UTC system. Nothing in these Guidelines alters those arrangements.

WHERE WE ARE ?

- Circular T has no expressed **uncertainty**
- **no Key Comparison** declared by CCTF
- **no calibration services** issued by CCTF

Why metrologist need KCs?

- To compare the physical realisation of SI units.
- To compare the measurement methods used in each Lab.
- The uncertainty of each KC result, includes uncertainties of the measurement method, the used equipment and the standard unit.

T & F Community:

- Do Time Scale comparison using GPS common view and TWSTFT methods.
- Results are sent to BIPM to elaborate TAI, UTC and
- UTC-UTC(k) in Circular T.
- Uncertainty = uncertainty of the comparison method.

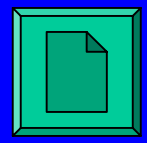
T & F

- Today, there is no ‘transfer standard’ stable enough to perform KC (in the usual way).
- Must run the path in the inverse way. From the SI unit to the measurement capability.

And we are not used to do this.

What to do?

- Build up a preliminary list of services.
- Review the CMC entries to send the services with no problems.
  - Frequency
  - Time scale difference
  - Time interval



What to do? cont. I

- Launch projects to define measurement standards.
- Launch projects to determine what are the right expressions for the uncertainty of each CMC line.

What to do? cont. II

- Workshops: to share knowledge and gain experience
- Dedicated publication (an ITU Handbook, Guide?) focused on ‘Frequency and Time calibrations’.

What to do? cont. III

- Any other suggestion, cooperation or comment will be welcomed.