

***GULF ASSOCIATION  
FOR  
METROLOGY  
(GULFMET)***

**دليل تنفيذ المقارنات البينية**  
***GUIDELINES  
ON  
CONDUCTING COMPARISONS***

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## **1- Introduction**

This document gives practical guidelines for comparisons within the framework of GULFMET in addition to the Technical Supplement to the Mutual Recognition Arrangement (MRA), for the recognition of national measurement standards and of calibration and measurement certificates issued by National Metrology Institutes (NMIs), and the BIPM document Guidelines for CIPM key comparisons. These comparisons may be GULFMET key comparisons, supplementary comparisons, bilateral comparisons or even pilot comparisons for the validation of new devices and /or new measurement techniques.

This document should always be used in combination with the CIPM and BIPM documents.

## **2- Participation in GULFMET comparisons**

Any of the members of GULFMET can take part in any GULFMET comparison, provided the technical competence of the institute is appropriate to the particular comparison. With the consent of all participating members of GULFMET other NMIs outside GULFMET can occasionally be invited to participate. In some of the GULFMET comparisons the number of participants can be limited for technical reasons.

## **3- Responsibilities for initiating and conducting GULFMET comparisons**

The Technical Committee (TC) Chair is responsible for initiating GULFMET key comparisons and supplementary comparisons. Each TC at each of its meetings examines the needs for comparisons, guided by the list of key comparisons identified by the relevant CIPM Consultative Committee (CC) and the periodicity of the comparisons as set by the CC, and decides which ones should be initiated at this meeting.

For each key comparison, a TC Chair elects the pilot institute from the member institute for running the GULFMET key comparison. In drawing up the provisional list of participants and approximate timetable, the TC Chair ensures that at least two of the participants will take part or have taken part in a similar CIPM key comparison so that the GULFMET comparison is properly linked to the CIPM key comparison.

If required by the pilot institute, one or two institutes from the provisional list are nominated by the TC Chair to help the pilot institute in drawing up the technical protocol and timetable for the comparison. The timetables of comparisons decided by the TC are discussed to ensure that the work load of the whole set of comparisons is not too great for the participating and pilot institutes and that the results will be available in three or occasionally two years time. It is recommended to propose comparisons in advance of a TC meeting, as this will enable the TC members to consult the management of their institute prior to this meeting. Such consultation may be necessary to reach agreement about the involvement of the institute in the comparison and, if so, to guarantee that the required resources and time needed to undertake the work will be made available. The

circulation time of transfer standards or transfer instruments must be fixed and should exceed eighteen months only in exceptional circumstances.

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Before each meeting of a TC, each member must know which workload they can accept taking into account the workload those comparisons in other fields lay on their institute.

After each meeting of the TC the TC Chair informs the GULFMET Secretary about decisions taken during the meeting on the GULFMET comparisons that are going to be organized.

In addition to comparisons initiated by a TC, bilateral GULFMET comparisons may be set up by two institutes on the conditions set out in section 10 of the Guidelines for CIPM key comparisons. The institutes must inform the TC Chair and the GULFMET Secretary before the comparison takes place. The TC Chair informs the TC members as soon as possible.

The same is applicable for pilot comparisons for the validation of new devices and/or new measurement techniques.

#### **4- Information to and from other regional metrology organizations**

The GULFMET Secretary informs yearly the secretaries other Regional Metrology Organizations (RMOs) about all comparisons that are running and planned for the near future in GULFMET.

If similar information is received from RMOs the GULFMET Secretary sends this information to all GULFMET members.

#### **5- Organization of a GULFMET comparisons**

The organization of a GULFMET comparison is performed in a similar way to that is described in section 5 of the Guidelines for CIPM key comparisons.

The technical protocol has to be drawn up according to section 6 of the Guidelines for CIPM key comparisons. The draft protocol must be sent to the TC Chair.

The invitation to participate is sent by the pilot institute directly to all members of the TC with a deadline for response. The invitation may also be sent to NMIs outside GULFMET with the restriction that actual participation for institutes outside GULFMET is subject to the consent of the participating members of GULFMET. The invitation is for information also sent to the GULFMET Secretary.

If other NMIs outside GULFMET have expressed an interest to participate in a comparison the pilot institute must ask the participating members of GULFMET to give their consent to the participation of these non-member institutes.

The pilot institute must also ask the participating members of GULFMET if, with a mixed participation of members of GULFMET and non-members, distinction between member institutes of

GULFMET and non-member institutes should be made in the evaluation of the results. In any case the non-members must accept the GULFMET roles adopted for this evaluation. This is especially relevant if the results of a comparison are meant to lead to a proposal for entries in the MRA database.

After these preliminary actions are completed the pilot institute must draw up a circulation scheme and inform the participants when they can expect the package.

The pilot institute then has to organize the transport of the transfer standards or transfer instruments and has to ensure that all the participants make proper arrangement for local customs formalities. This includes also handling instructions for the equipment at the customs offices.

After arrival of the package, the participating institutes must inform the pilot institute of this immediately with details on the state of the package and its contents.

See for more detail section 7 of the Guidelines for CIPM key comparisons.

## **6- Late entry in a comparison**

If a member of GULFMET expresses an interest in participation in a comparison that has already started the pilot institute must consider what effect the participation may have on the time schedule.

The a priori assumption should be that the additional participation should not extend the comparison more than the minimum time necessary. If all the participants are content then the entry can be accepted. If the time schedule is unduly exceeded an extra loop must be added for which the late participant can be asked to do most of the work for the preparation of the report.

Non member institutes wanting to participate in a comparison that has already started can only be fitted in if GULFMET participants agree and a reasonable time schedule for the regular circulation can be kept. Otherwise it is left to the pilot institute to enter a bilateral comparison with the non-member institute after the GULFMET comparison is completed.

## **7- Performing GULFMET comparisons**

Measurements for GULFMET comparisons must be performed according to the technical protocol.

If an institute cannot for some technical reason perform the measurements according to this protocol and still wishes to participate proper consultation with the pilot institute must take place before measurements are made.

## **8- Reporting the results of a GULFMET comparison**

The participating laboratories must submit the report of the results of a comparison to the pilot institute as soon as possible and at the latest six weeks after the measurements are completed. See

for more *detail section 8 of the Guideline for CIPM key comparison*. Any additional significant detail should also be reported to the pilot laboratory.

## **9- Preparation of the report on an GULFMET comparisons**

*See section 9 of the Guideline for CIPM key comparisons.*

In a special section in the report of an GULFMET key comparison the connection between this comparison and similar CIPM key comparison must be described.

When Draft A is submitted to the participants the pilot laboratory must also give a proposal in accordance with *section 11 of the Guideline for CIPM key comparisons*, for the form in which the results of the comparison should finally be published.

A consensus between the participants on the form of the publication must be reached.

When Draft B of an GULFMET comparison is completed by the pilot laboratory it must be submitted to the TC Chair.

## **10- Getting approval of the relevant Consultative Committee on the report of a GULFMET key comparison and the proposal for entry of the results in the comparison database**

The TC Chair must decide within six weeks if in his opinion Draft B is ready for submission to the relevant Consultative Committee. In order to come to this decision the TC Chair may consult other members of his TC.

The accepted Draft B is the final report of the GULFMET key comparison and then sent by the TC Chair to the executive secretary of the relevant Consultative Committee and the chairman of the appropriate CC key comparison Working Group confirming that the key comparison has been carried out according to *the Guideline for CIPM key comparisons* and that it meets all the requirements of paragraphs *T.9 and T.10 of the MRA*. The procedure for an GULFMET supplementary comparison is exactly the same.

## **11- Publication of the results of an GULFMET comparison and entry in the relevant databases**

The pilot laboratory sends the final report to the participants, to the GULFMET Secretary for information. The GULFMET Secretary files the report with an GULFMET report number, which is utilized as reference.

The pilot laboratory sends in a report for publication in accordance with the decision taken by all participants on the form of this publication (see section 8).

### **Appendix 1**

Information to the CC on GULFMET proposed key and supplementary comparisons

A - When GULFMET wishes to start a key comparison the corresponding protocol should be sufficiently close to that already used in the CIPM key comparison so that its results can be linked to those of the CIPM key comparison; if there is any doubt about as to whether or not the GULFMET protocol is sufficiently close to that of the CIPM key comparison, the chairman of the appropriate CC or the chairman of the appropriate CC key comparison Working Group should be consulted at an early stage to avoid problems later on.

B - Details of the proposed key comparisons should be sent to the chairman of the appropriate CC or the chairman of the appropriate CC key comparison Working Group.

C - In the absence of any problem identified by the chairman of the appropriate CC or the chairman of the appropriate CC key comparison Working Group, after taking any advice he or she considers necessary, the details are passed to co-ordinator of the BIPM key comparison database for entry.

D - If GULFMET starts a key comparison before the corresponding CIPM key comparison has been started (paragraph T.9-f of the MRA), the chairman of the appropriate CC or the chairman of the appropriate CC key comparison Working Group should be informed by the TC Chair.