

APMP-G2

The Guidelines on conducting comparisons

Introduction

This document gives practical guidelines for comparisons within the framework of APMP 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 APMP 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.

1 Participation in APMP comparisons

Any of the members of APMP can take part in any APMP comparison, provided the technical competence of the institute is appropriate to the particular comparison. With the consent of all participating members of APMP other NMIs outside APMP can occasionally be invited to participate.

In some of the APMP comparisons the number of participants can be limited for technical reasons.

2 Responsibilities for initiating and conducting APMP comparisons

The Technical Committee (TC) Chair is responsible for initiating APMP 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 APMP 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 APMP 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

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

Before each meeting of a TC, each member must know which workload they can accept taking into account the workload that comparisons in other fields lay on their institute. After each meeting of the TC the TC Chair informs the APMP Secretary about decisions taken during the meeting on the APMP comparisons that are going to be organized.

In addition to comparisons initiated by a TC, bilateral APMP 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 APMP 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.

3 Information to and from other regional metrology organizations

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

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

4 Organization of an APMP comparisons

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

The responsibilities of the APMP for regional key and supplementary comparisons should be considered referring the paragraphs T.9 and T.10 of the MRA.

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 and the TC Chair should send it to the chairman of the appropriate CC Technical Working Group (see CC directory on the BIPM web site) and to the executive secretary at the BIPM of the appropriate CC. If the chairman of CC Technical Working Group points out problems in the protocol, the TC chair should make arrangement to obtain consensus for the protocol.

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 APMP with the restriction that actual participation for institutes outside APMP is subject to the consent of the participating members of APMP. The invitation is for information also sent to the APMP Secretary.

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

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The pilot institute must also ask the participating members of APMP if, with a mixed participation of members of APMP and non-members, distinction between member institutes of APMP and non-member institutes should be made in the evaluation of the results. In any case the non-members must accept the APMP 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.

5 Late entry in a comparison

If a member of APMP 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 APMP 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 APMP comparison is completed.

6 Performing APMP comparisons

Measurements for APMP 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.

7 Reporting the results of an APMP 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.

8 Preparation of the report on an APMP comparisons

See section 9 of the Guideline for CIPM key comparisons.

In a special section in the report of an APMP 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 APMP comparison is completed by the pilot laboratory it must be submitted to the TC Chair.

9 Getting approval of the relevant Consultative Committee on the report of a APMP 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 APMP key comparison and is then sent by the TC Chair to the APMP secretariat. The secretariat should send it to the chairman of the CC Key Comparison Working Group (or other designated Working Group) and to the executive secretary of the appropriate CC, with a statement written by the APMP Chair confirming that the key comparison has been carried out according to the *Guidelines* and that it meets all the requirements of paragraphs T.9 and T.10 of the MRA. The procedure for an APMP supplementary comparison is exactly the same.

10 Publication of the results of an APMP comparison and entry in the relevant databases

The pilot laboratory sends the final report to the participants. The APMP Secretariat files the report, which is utilized as reference. The secretariat should also make copies of the report and send each copy to the BIPM, the Chair of appropriate CC and other RMOs.

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 APMP proposed key and supplementary comparisons

A - When APMP 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 APMP 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 APMP 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.