

## GUIDE FOR A PEER REVIEW

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**Abstract** - This guide has been developed with the purpose of having a method to conduct a peer review. The objective is to set the general guidelines to ensure the objectives, development, documentation of the findings and the final report writing in a peer review. This guide is based in a previous document [1] and includes recent documents recommendations from CIPM, JCRB as well as ISO written standards and peers recommendations from peer reviews conducted.

**Keywords:** Peer review, guide.

### 1. INTRODUCTION

This guide has been developed with the purpose of having a method to conduct a peer review, clearly ensuring the objectives, development, and documentation of the findings and the writing of the final report. This guide is based in the paper [1] including the recommendations of [2].

In writing this guide, the recommendations from [3, 4, 5, 6, 7, 8], mainly from CIPM and ISO, were also taken into consideration.

### 2. OBJECTIVE

To propose general guidelines for the performance of a peer review, ensuring that:

- The staff assigned to the measurement and/or calibration activities and their supervisors are technically competent;
- The laboratory is capable of obtaining valid technical results according to the declared measurement and calibration capabilities (CMCs).

The reference basis for the peer review is *Good Laboratory Practices* applied to the laboratory activities, according to the experts experience in a given task.

### 3. FORMALIZATION OF A PEER REVIEW

In order to have a peer review with adequate technical depth, in both, the laboratory's activities and the way it realizes and maintains its technical competence, the laboratory interested in a peer review shall select the specialist(s) for the peer review team, taking into account their professional experience and their recognition by the

international metrological community (see details in Annex I).

The selected specialist(s) team (Peer Review Team), shall consist of specialist(s) who perform similar activities in other National Metrology Institutes (NMIs) in the quantities of interest with better or similar measurement ranges and uncertainties.

### 4. PEER REVIEW SCOPE

The interested laboratory shall declare the calibration and measurement capabilities (CMCs) to be reviewed by each reviewing specialist in accordance with their area of expertise. The laboratory shall also propose dates and place for the review. If the laboratory decides to use a reference document for the review, it shall indicate it to the reviewing team. The specialists shall consider their technical competence and knowledge of the reference documents proposed for the review to accept or reject the request. The interested laboratory shall indicate if the reports resulting from the review are to be issued separately for each reviewed field or if one combined report is to be presented for all fields.

It is strongly recommended that the local regional metrology organization (RMO) be informed of the peer review request, the members of the specialist team and the scope of the exercise.

### 5. DOCUMENTAL PREPARATION AND REVIEW

It is recommended that firstly, an agreement of the peer review reference documents is carried out as well as a documental review.

#### 5.1 Peer review terms of reference

The following points should be agreed upon between the peer review team and the subject laboratory (these constitute the peer review terms of reference):

- Objective and scope of the peer review.
- Place and date of the onsite visit peer review (if required).
- Language for oral and written communication.
- Travel, lodging and per diem expenses arrangement.

## 5.2 Documental review

It is recommended that, previous to the onsite visit review, the review team have the following information:

- The list of services included in the Appendix C of the Mutual Recognition Arrangement (MRA) and/or CMCs to be reviewed.
- Curriculum Vitae of the staff conducting measurement activities and/or calibrations and their supervisors (qualifications and technical capabilities).
- Calibration and measurement methods, uncertainty estimations and method validation.
- Measurement and/or calibration procedures used; including standards (laboratory's standard instrument) used.

The peer review team reviews the documentation and verifies if it is sufficient and adequate to support the activities needed for the CMCs. The specialist team prepares the onsite visit review program, putting special emphasis on the points where there are perceived findings or those considered more important.

It is recommended that a check list be prepared, as a result of the documentation review. This list will aid documentation of possible findings during the onsite visit review. A verification list may be prepared by following the aspects included in point 6.2.

## 6. ONSITE VISIT REVIEW

### 6.1 Onsite visit peer review opening meeting

The first activity is an onsite visit review opening meeting among the Review Team and the staff of the reviewed laboratory, with the purpose of verifying the objectives and scope of the peer review. The work activities program during the onsite visit peer review as well as the laboratory staff to be participating in the activities is also to be agreed upon here.

In this meeting, the laboratory will assign the responsible person to assist each specialist during the exercise, as well as the person(s) to whom the peer review report(s) should be addressed. The peer review schedule should be defined and agreed upon.

### 6.2 Assessment of the laboratory activities

The aspects to be assessed are:

- a) The staff technical competence to perform the measurement and/or calibration activities to be reviewed, including their education, experience and abilities and those of their supervisors.
- b) Control and monitoring of environmental conditions.
- c) Calibration and measurement methods, uncertainty estimations and method validation.
- d) Suitability of equipment and equipment maintenance programs.
- e) Measurement traceability.
- f) Methods used for assuring the quality of measurements and calibrations.
- g) Contents and format of calibration / measurement reports.

- h) Technical records that demonstrate that the claimed uncertainties have been ordinarily achieved by the NMI.
- i) Measurement and/or calibration procedures used.
- j) It is expected that each CMC of the Appendix C of the MRA and those declared in the scope of the Peer Review will be reviewed.

### 6.3 Findings documentation

The findings should be documented stating the subject and the level of concern for each one. The suggested levels of concern for the findings are:

- a) *Critical*, a finding that seriously compromises the laboratory's ability to support a CMC;
- b) *Minor*, a finding that does not compromise the laboratory's ability to support a CMC but may have some effect on the results;
- c) *Recommendation*, a suggestion that may help the laboratory in a given task;
- d) *Comment*, no concern, a comment which may be not related to the assessment technical or management activities but may be of positive connotation on the behaviour of the laboratory personnel and/or the way the review process was assisted.

The peer review team should be assigned a meeting room for close door meetings, to work in the findings documentation and preparation for the onsite visit peer review closure meeting and report.

### 6.4 Onsite visit review closure report

All the findings (including observations, improvement opportunities and additional information requests) will form the peer review closure report.

### 6.5 Onsite visit peer review closure meeting

An onsite visit peer review closure meeting takes place among the peer review team and the involved laboratory members. The draft onsite visit peer review report is presented and any problems or misunderstandings are clarified.

As a result, a final onsite visit peer review report is to be written and forwarded to the responsible person(s) of the laboratory within a short and agreed upon time after the closure meeting.

## 7. PEER REVIEW FINAL REPORT

After the peer review team receives any additional requested information from the laboratory and analyzes it, the final report is written. A proposed content for this final peer review report is presented in Annex II.

## 8. GRAPHICAL PROCEDURE OF A PEER REVIEW

In Fig. 1, included in Annex III, a process diagram is presented with the recommended activities for a peer review, as well as the part responsible of the activity (either the peer review team or the laboratory).

## 9. CONCLUSIONS AND RECOMMENDATIONS

This guide is written with the purpose of supplying the minimum reference documentation required to carry out a peer review, mainly, for the technical aspects (i. e. chapter 5 of ISO 17025).

### REFERENCES

- [1] Torres-Guzman J. C., Chapman G., Viliesid Alonso M., Cederborg Almeysa B., "Proposed Guide for Peer Review". IMEKO TC3, TC16, TC22 International Conference. Mexico 2007.
- [2] "Recommendations for on-site visits by peers and selection criteria for on-site visit peer reviewers". Draft document CIPM 2006-05, Version 3.0.
- [3] "Criteria for acceptance of data for Appendix C". JCRB-14/06(2a).
- [4] L Becerra, W Bich, S Lorefice, "Protocol for the peer review for mass and density CMCs of CENAM". CENAM, Mexico 2008.
- [5] ISO 19011:2002 *Guidelines for quality and/or environmental management systems auditing*.
- [6] ISO/IEC 17025:2005 *General requirements for the competence of testing and calibration laboratories*.
- [7] ISO 9001:2000 *Quality management systems – Requirements*.
- [8] ISO/IEC CD2 17040:2002 *General requirements for peer assessment of conformity assessment bodies*.

### ANNEX I. SELECTION OF REVIEWERS

According to document [2] from the reference section, the selected reviewers should normally have at least a degree qualification in a scientific/technological discipline. In some cases, formal education can be substituted by extensive experience in the relevant field of expertise.

#### I.1 International recognition

In addition, the following elements are desirable in the selected reviewers:

- a) past or present member of an RMO TC;
- b) participation in key and supplementary comparison programmes;
- c) publication record in internationally refereed metrology journals;
- d) experience in undertaking national or international assessments of calibration or testing in laboratories.

#### I.2 Work experience

A peer reviewer should have the following work experience:

- a) generally five years experience in developing, providing or being responsible for a calibration or a measurement service in a technical field relevant to the CMCs being investigated;

- b) two years experience of quality management, quality assurance or QS auditing related to laboratory activities at the NMI level;
- c) in the absence of QS experience the peer reviewer should, during the assessment, work with a QS expert who has participated in assessments for accreditation by recognized accreditation providers.

#### I.3 Other required characteristics

Other required characteristics for the peer reviewers:

- a) Peer reviewers should be conversant with the language in which the relevant documentation is provided.
- b) Peer reviewers should have successfully completed a training course on the ISO/IEC 17025:2005 requirements, conducted by a competent organization (e.g., NMI or recognized accreditation body for calibration laboratories).
- c) If the review needs to cover the manufacturing of reference materials then the reviewer should have additionally sufficient knowledge and experience with the requirements of ISO Guide 34:2000.

### ANNEX II. FINAL REPORT CONTENTS

It is recommended to prepare a final report which includes the following points:

- 1) Antecedents.
  - a) name of the NMI;
  - b) date(s), scope and programme of the on-site visit;
  - c) names and affiliations of the reviewers.
- 2) Scope and General Overview.
- 3) Findings.
  - a) review findings against all the aspects specified in the scope (4.2);
  - b) comments on the NMI's non-conformities and, where applicable, actions taken to correct non-conformities.
- 4) Conclusions.
  - a) a list of capabilities that the reviewers recognise the NMI as having the competence to deliver ordinarily;
  - b) the adequacy of NMI's management system and its implementation to demonstrate the conformity with the requirements of CIPM-MRA (where applicable);
  - c) an explanation of any significant differences of opinion between the reviewer and NMI;
- 5) References.
  - a) identification of the reference documents used.
- 6) Annexes.
  - a) only, if it is required to supply any additional information to clarify the report.

### ANNEX III. PROCESS DIAGRAM FOR A PEER REVIEW

A process diagram for a peer review is shown in Fig. 1 (next page).

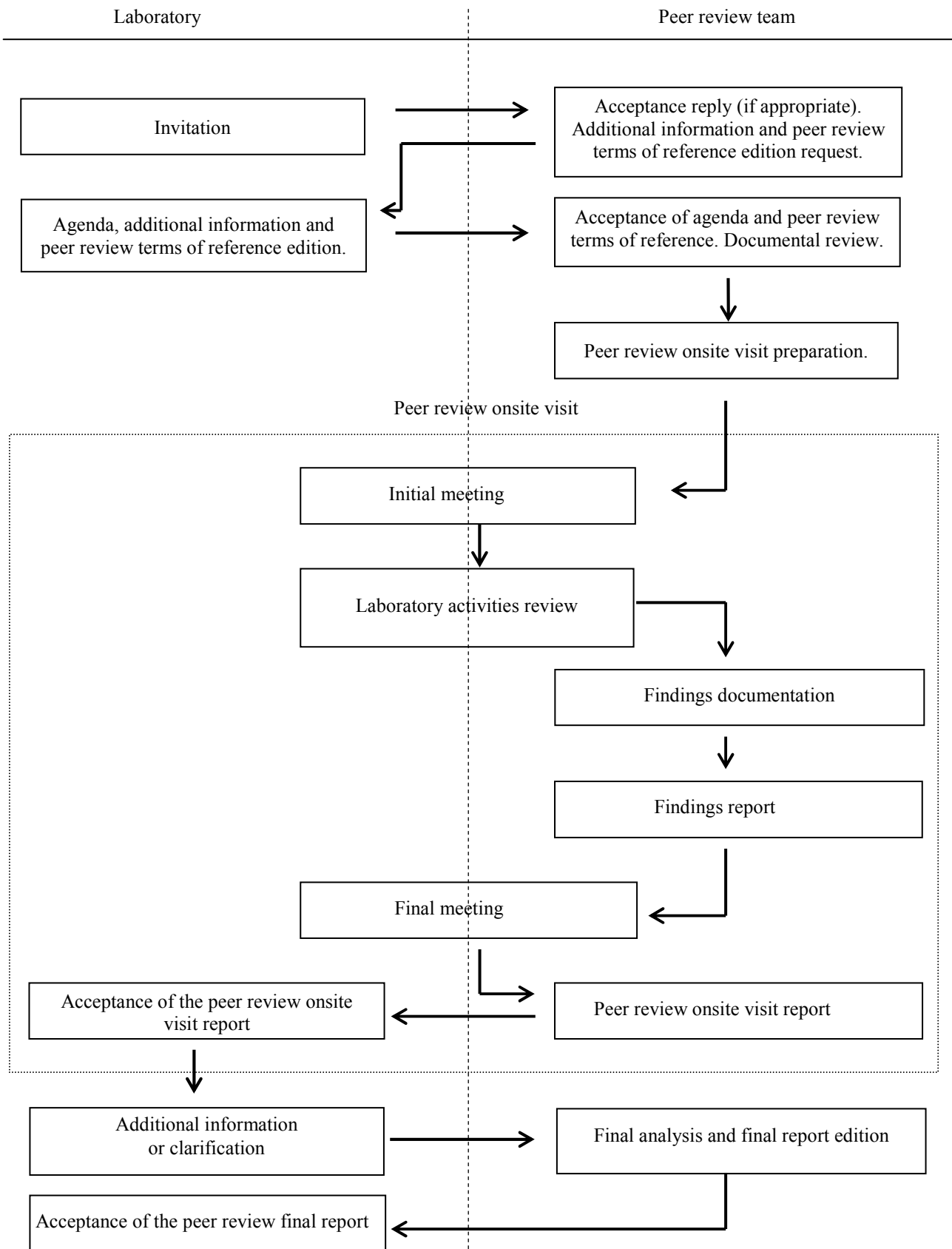


Figure 1. Process diagram for a peer review.