Overview of APMP Process for Intra-RMO CMC Submission and Review

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APMP NMIs follow one of the following **three pathways** to demonstrate their technical capability and compliance with ISO 17025/Guide 34 (see Appendix 1):

(a) Third party accreditation
(b) Certification to ISO 9001:2008 and attestation by technical peers
(c) Attestation by a team consisting of quality system experts and technical peers

Irrespective of the chosen pathway, the process of submission and review of calibration and measurement capabilities (CMCc) includes two main stages, as illustrated in Figure 1.

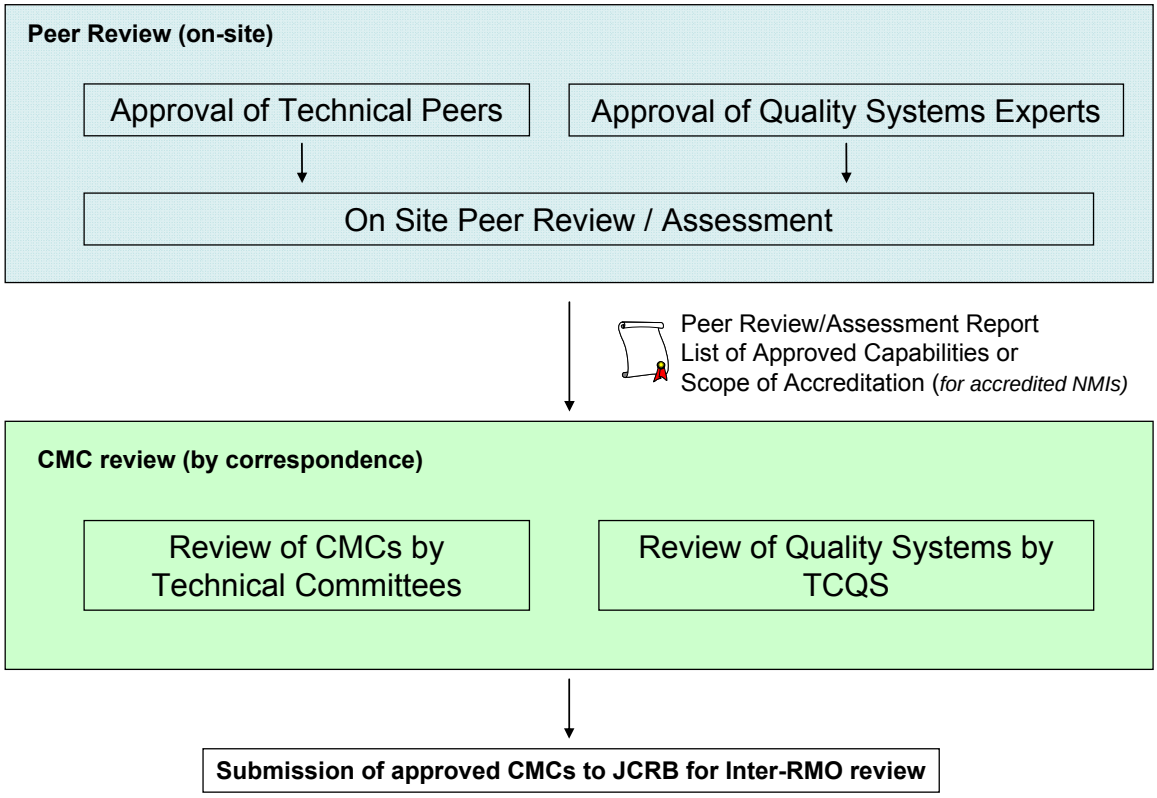

Figure 1. Simplified Diagram of CMC Review Process

First, all proposed and existing CMCs, and the supporting quality system, undergo an **on-site peer review**. For NMIs following pathway (a), the review coincides with the assessment for the purposes of accreditation to ISO 17025 and is conducted by an accreditation body recognised through APLAC or ILAC MRA and technical assessor(s) that are approved by the

relevant APMP Technical Committee (TC) prior to the review. For NMIs following pathways (b) and (c) the on-site peer review may be organised by the NMI or another recognised body, such as an accreditation body or APLAC. Both technical peers and quality system experts are, again, approved prior to the review visit through the process given in section 5 of Appendix 1.

Following the completion of the On-site Peer Review, the second stage, **review of CMCs by correspondence** can start. This stage uses the results of the on-site peer review, including the list of capabilities approved by the on side peer reviewers, as part of the evidence to support the proposed CMCs. The CMCs are reviewed by the relevant TC and the supporting quality systems by the Technical Committee on Quality Systems (TCQS). Once both technical review of CMCs and the quality systems review are complete, the proposed CMCs are submitted to JCRB for inter-regional review.

Figure 2 shows the process in more detail.

1 Request for approval of technical reviewers. NMI submits to TC Chair, in a specified format, a request to approve technical reviewers.

2 Approval of technical reviewers. The TC approves technical reviewers, TC Chair notifies NMI.

3 On-site peer review / assessment.

4 CMC Submission. NMI submits to TC Chair, TCQS Chair and APMP Secretary proposed CMCs (spreadsheet) with evidences specified in APMP-QS2 (Appendix 1) and questionnaire APMP QS-1 (Appendix 2).

5 Review Request. TC Chair initiates review following guidelines for the relevant TC. Appendixes 5 and 6 show examples for TC specific guidelines. TC Chair also requests TCQS Chair for quality systems review.

6 Review Results. CMC reviewers or chairs relevant of working groups submit results of CMC review to the TC Chair. Quality Systems reviewers submit to TCQS Chair results of quality systems review using APMP QS-3 (Appendix 3)

7 Review Results, Additional information/questions. TC Chair submits the results of technical review to NMI. TCQS Chair submits additional quality systems related questions to NMI.

8 Revision, Reply. NMI reviews results of technical review and submits modified CMCs, if necessary, to TC Chair. NMI replies to TCQS Chair

9 QS Approval Notice. TCQS Chair submits final results of quality systems review to TC Chair and APMP Secretary.

10 Posting CMCs. TC Chair posts CMCs on JCRB web site for inter-regional review. TC Chair or TCQS Chair notifies JCRB that the proposed CMCs are covered by quality system. APMP Secretary regularly informs JCRB of the status of quality systems in APMP NMIs. See Appendix 4 (APMP QS9).

11 Review Request. JCRB website generates request for inter-regional CMC review and sends it to representatives of Regional Metrology Organizations (RMOs).

12, 13, 14 Review Results. RMOs submit review results to TC Chair via JCRB web site. TC Chair forwards to NMI.

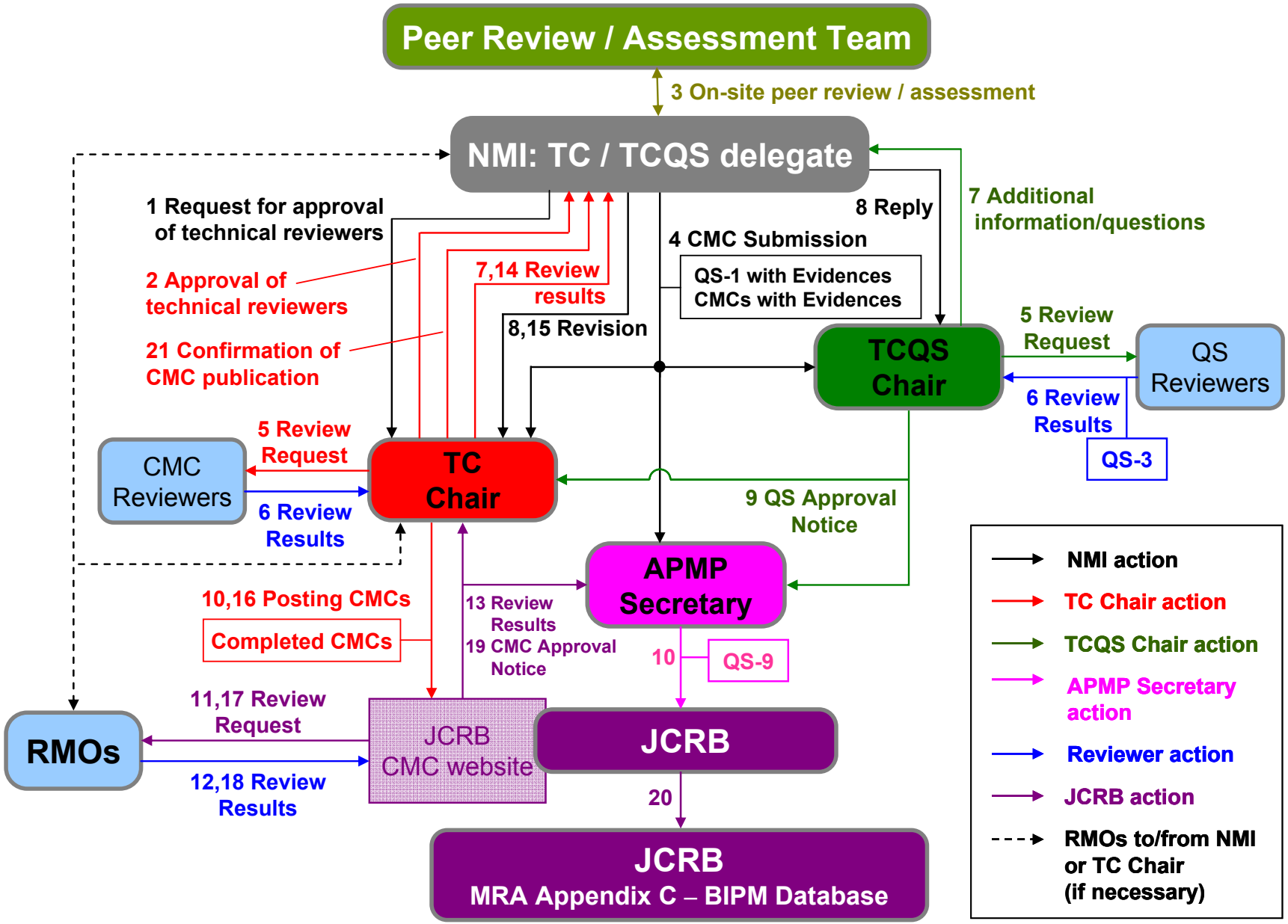

Figure 2. Detailed Diagram of CMC Review Process

15 Revision. NMI reviews CMC, if necessary, and submits to TC Chair and/or RMO reviewers.

16 Posting CMCs. TC Chair posts revised CMCs on JCRB web site**.**

17 Review Request. JCRB website generates request to approve revised CMCs and sends it to representatives of RMOs.

18 Review Results. RMO representatives post CMC approval or relevant comments on JCRB web site.

19 CMC Approval Notice is generated by JCRB.

20 Approved CMC are published in Appendix C of BIPM Database.

Further details can be found in the Guidelines given in Appendixes.

List of Appendixes

Note. APMP TCT uses CCT WG8 CMC review protocols. See *Int J Thermophys (2008) 29:1193–1203 DOI 10.1007/s10765-008-0377-1*

Appendix 1. APMP QS-2

APMP GUIDELINES FOR ACCEPTING A QUALITY SYSTEM(V.2.0 WD2)

approved on July 2010

The CIPM global mutual recognition arrangement (global MRA) requires national metrology institutes (NMIs) to have in place a recognised quality system in order to,

- establish the mutual confidence in measurement and calibration certificates issued by the NMIs, and
- thereby provide governments and other parties with a secure technical foundation for wider agreements related to international trade, commerce and regulatory affairs.

Paragraph 7.3 of the text of global MRA:2003 indicates the requirements for a quality system to be recognised. It was left to the regional metrology organisations (RMOs) to develop guidelines for acceptable quality systems.

This document gives the APMP guidelines for accepting a quality system, and the evidence required to demonstrate compliance with the guidelines.

1. Basic Requirement

In order for the APMP to accept a quality system of an NMI as satisfying the requirements of the global MRA, it requires evidence demonstrating

(i) the implementation of a quality system satisfying ISO/IEC 17025:2005 (or for reference material producers, ISO Guide 34:2000 or ILAC Guide 12:2000), and
(ii) technical competence to provide a calibration and measurement service that can deliver the uncertainties claimed.

2. Compliance

Compliance could be demonstrated through one of the following three pathways;

(b) Third party accreditation (technical assessors must meet criteria given for technical peers; see item 5), or

(b) Certification to ISO 9001:2008 and attestation by technical peers, or

(c) Attestation by a team consisting of quality system experts and technical peers. This may be organised by the NMI or another recognised body, such as an accreditation body or APLAC.

Notes:

- Third party accreditation must be from an accreditation body operating to ISO/ IEC 17011:2004 and is a signatory to the APLAC or ILAC MRAs.

- Certification to ISO 9001:2008 must be from a conformity assessment body which is operating to ISO/IEC 17021:2006 and is accredited by a signatory of PAC or IAF MLAs.

- Criteria for selecting technical peers and quality system experts are given later in this document (see Item 5).

3. Evidence

3.1 NMIs following pathway (a)

NMIs following pathway (a) - third party accreditation, must submit the following evidence to APMP;

- Copies of accreditation certificate(s).
- Scope of accreditation.
- Names and affiliations of technical assessors or technical peers.
- Assessment report / technical peer review report
  (for details please see the attached ' Report to be submitted by NMI selecting pathway (a)')

3.2 NMIs following pathway (b)

NMIs following pathway (b) - ISO 9001:2008 and attestation by technical peers, must submit the following evidence to the APMP;

- Quality (ISO 9001:2008) certificate(s) with details of areas covered by the certification.
- Report by the technical peers. This report must be prepared after review visits made for assessment against the relevant* technical requirements of the selected standard/guide and must have the following minimum contents:
  - Scope of the review
  - Schedule of the review
  - Names and affiliations of the technical peers
  - Findings of the Review Team (especially the non-conformances)
  - Listing of the NMI's capabilities
  - Any other comments
  - Attestation by the technical peers
  - Signatures and dates

  (for details please see the attached ' Reports by Review Team – Minimum Contents')
- Final attestation by the technical peers, or at least the leader of the review team, stating that all the non-conformances have been satisfactorily addressed.

** A requirement would be considered 'not relevant' only if the function/activity was not carried out by the NMI, e.g. sampling.*

3.3 NMIs following pathway (c)

NMIs following pathway (c) - attestation by a team consisting of quality system experts and technical peers, **organised by the NMI or through a recognised accreditation body or APLAC**, must submit the following evidence to the APMP;

- Report by the review team consisting of quality system experts and technical peers. This report must be prepared after review visits made for assessment against the relevant* requirements of the selected standard/guide and must have the following minimum contents:
  - Scope of the review
  - Schedule of the review

- Names and affiliations of the technical peers
- Names, affiliations, qualifications and experience of the quality system experts.
- Findings of the Review Team (especially the non-conformances)
- Listing of the NMI's capabilities
- Any other comments
- Attestation by the reviewers
- Signatures and dates

(for details please see the attached 'Reports by Review Team – Minimum Contents')

- Final attestation by the reviewers, or at least the leader of the review team, stating that all the non-conformances have been satisfactorily addressed.

** A requirement would be considered 'not relevant' only if the function/activity was not carried out by the NMI, e.g. sampling.*

4. Other Requirements

4.1 On-going monitoring of QMS

- Annual report* must be submitted by NMIs and DIs to TCQS meeting four weeks in advance to provide the evidence that the quality system is implemented and in operation.

- APMP must be informed of changes in key personnel, and of changes in facilities that would restrict the NMIs capability to provide measurement services covering the CMCs.

- The quality manager or representative of NMIs and DIs has to present annual report in the TCQS meeting.
  ** For details please see the attached "Annual report form"*

4.2 Re-approval of QMS

- Review/assessment visits for a given area (TC) must be conducted at least once every five years.
- For the re-approval of QMS, TCQS requires selected NMIs and DIs to provide the list of present CMCs covered by QMS including the latest dates when the CMCs were on-site peer reviewed and/or updated. The schedule of the re-approval is planned by TCQS.
  The quality manager or representative of NMIs and DIs has to report the results of review/assessment in the TCQS meeting.

4.3 APMP Report to JCRB

The APMP representative to the JCRB is responsible for reporting on the status of Quality Management System of APMP NMIs and DIs in the JCRB meeting. It is the responsibility of TCQS to prepare the report.

5. Technical Peers, Quality System Experts

- Technical peers and quality system experts must be independent of the NMI being assessed/reviewed.

- Technical peers (assessors/ reviewers) must be acceptable to the relevant TC. It is recommended that this acceptance be obtained by the applicant NMI from the relevant TC in

advance. This may be done by providing the relevant TC chair with the information on the technical peers in the format described at the end of this document – see Format for Technical Peer Approval". The approval of the TC should also be provided using the same format.

Technical assessors/technical peers may be considered acceptable, if
1. they have relevant technical competence,
2. have had some formal training in laboratory assessments, and
3. have laboratory assessment experience.

If, during the review, the technical assessors/technical peers work with or under the guidance of quality system experts, it may not be necessary to insist on 2 and 3 above.

- It is required that technical assessors/ technical peers be selected from NMIs with capabilities similar to or higher than the NMI being assessed/reviewed.

  However, in exceptional circumstances, technical assessors/ technical peers from organisations outside the NMI community may be selected, with the approval of the relevant Technical Committee and the APMP Executive Committee.

- A quality system expert should be a person who normally conducts or in the past has normally conducted assessments for accreditation on behalf of an accreditation body which is operating to ISO/IEC 17011:2004 and is a signatory to the ILAC or APLAC MRAs.

Report to be submitted by NMI selecting pathway (a))

An APMP NMI that chooses to follow pathway (a) is required to submit the assessment report provided by accreditation body or technical peer review report prepared by technical peers to the APMP.

Any format of the assessment report issued by the accreditation body may be accepted. However, it must be in English. Normally technical peer review reports are in English. Therefore if the assessment report is not in English, the technical review report can be submitted.

The following contents are expected to be included in the assessment report or technical peer review report.

(a) Scope of the assessment

- what is being assessed (specific areas of the laboratory);
- to which standard/guide guide is the assessment being conducted (e.g. ISO/IEC 17025:2005, ISO Guide 34:2000, ILAC Guide 12:2000).

(b) Schedule of the review

dates, times, locations.

(c) Names and affiliations of the reviewers

Names and affiliations of the reviewers with the leader of the team clearly identified. If different reviewers were responsible for different areas, this should be noted.

(d) Findings of the Review Team

Findings of the review team given with reference to the relevant sub-clauses of the standard/guide.

(e) Listing of the NMI's measurement capabilities

Listing of the NMI's measurement capabilities approved/recognised by the technical assessors or technical peers, which are equivalent to the accredited scope of NMI.

(f) Any other comments.

(g) Signatures and dates.

Note : The APMP could, if it feels necessary, call for additional information; e.g. details of the corrective actions taken to address a given non-conformance.

Report by Review Team (pathway (b) or (c)- Minimum contents

An APMP NMI that chooses to follow pathway (b) or (c) and undergoes a peer review process, is required to obtain a report by the review team for submission to the APMP. The minimum contents expected in this report are described below.

This report may be accompanied/followed by a full report containing additional/extensive information. This report should preferably be prepared at the same time as when the full report is being prepared.

(a) Scope of the review

- what is being reviewed (specific areas of the laboratory);
- to which standard/guide or part of the standard/guide, is the review being conducted (e.g. ISO/IEC 17025:2005, ISO Guide 34:2000, ILAC Guide 12:2000, Clause 5 of ISO/IEC 17025:2005).

(b) Schedule of the review

dates, times, locations.

(c) Names and affiliations of the technical peers; Names ,affiliations, qualification and experiences of the quality system experts

Names and affiliations of the reviewers with the leader of the team clearly identified. If different reviewers were responsible for different areas, this should be noted.

(d) Findings of the Review Team (*see next page for recommended format)*

Findings of the review team given with reference to the relevant sub-clauses of the standard/guide (non-conformances must be described).

(e) Listing of the NMI's measurement capabilities (*see next page for recommended format)*

Listing of the NMI's measurement capabilities approved/recognised by the reviewers (equivalent to the scope of accreditation of NMIs following 7.3(a)).

(f) Any other comments.

(g) Attestation by the reviewers

Attestation by the reviewers that subject to the satisfactory resolution of the non-conformances, such as the demonstration of the laboratory of

(i) the implementation of a quality system satisfying the relevant standard/guide, and

(ii) the technical competence to provide a calibration and measurement service that can deliver the uncertainties claimed.

(h) Signatures and dates.

Note 1: The APMP could, if it feels necessary, call for additional information; e.g. details of the corrective actions taken to address a given non-conformance.

Note 2: Once the non-conformances have been addressed, a separate attestation must be made by the reviewers, or at least by the leader of the review team, stating that all the non-conformances have been satisfactorily addressed.

RECOMMENDED FORMATS

Format for the Findings of the Review Team

Use **OK** for "Complying with requirement", **NC** for "Non-conformance found" and **NR** for "Not reviewed" in column 2 (Code) of the table below.

Clause Number(s)	**Code** (OK/NC/NR)	**Description of the non-conformance and/or any other comments**
e.g. 4.1		
4.2		
4.3		
e.g. 5.1		
5.2		
5.3		

Listing of NMI's Measurement Capabilities

Measurand (Quantity)	Instrument/ Artefact	Range	measurement Conditions/ Independent variables	Expanded Uncertainty		Comments (if necessary)
				coverage factor k	level of confidence	

Format for Technical Peer Approval

Information to be provided by the NMI to be reviewed to the relevant TC

A. Details of NMI and Area to be reviewed

Name of NMI to be reviewed:

Field/area to be reviewed:

Capabilities to be reviewed:

(a) Capabilities to be **re-approved** (attach list where necessary):

(b) Capabilities to be **newly approved** (attach list where necessary):

It is expected that the technical peer is an expert in the area(s) to be newly approved. In case the technical peer is not necessarily an expert in the area(s) to be re-approved, provide the names of the technical peers who initially approved the areas to be re-approved.

B, Details of Technical Peer to be approved:

If there are more than one technical peer to be approved by the same TC, repeat this B section for each technical peer.

Name of the technical peer:

NMI of the Technical Peer:

Current Position in the NMI and responsibilities:

Brief summary of professional career:

Technical assessors/technical peers may be considered acceptable, if

- *they have relevant technical competence,*
- *have had some formal training in laboratory assessments, and*

- *have laboratory assessment experience.*

Relevant experience in the particular technical field/area to be assessed:

B, Details of Technical Peer to be approved: (Continue)

Any formal training in quality systems and/or laboratory assessments:

Laboratory assessment experience:

If the technical peer does not have suitable quality system and laboratory assessment training and experience, he/she should work with or under the guidance of a quality system expert.

Information to support above statement:

C, Approval:

Note that that technical assessors/ technical peers are expected to be from NMIs with capabilities similar to or higher than the NMI being assessed/reviewed. The CMCs of the Technical Peer's NMI could be used to make this judgement.

Approved on behalf of the relevant TC:

Name: ---

TC: ---

Date: ---

In exceptional circumstances, technical assessors/ technical peers from organisations outside the NMI community may be selected, with the approval of the relevant Technical Committee and the APMP Executive Committee.

Approved on behalf of EC:

Name: ---

Date: ---

Format for Quality System Experts Approval

This format is generally used by the NMI following pathway (C).

A. Details of NMI and Area to be reviewed

Name of NMI to be reviewed:

Pathway selected by the NMI:

B, Details of Quality System Expert to be approved:

Name of the quality system expert:

Organisation:

Current Position:

Brief summary of professional career:

A quality system expert should be a person who normally conducts or in the past has normally conducted assessments for accreditation on behalf of an accreditation body which is operating to ISO/IEC 17011:2004 and is a signatory to the ILAC or APLAC MRA.

Information to support above statement:

C, Approval:

Approved on behalf of TCQS:

Name: ---

Date: ---

QMS Annual report to APMP

—Year 20…. —

In order for the APMP to assure the continuous effectiveness of NMI's quality management system, it is required that the member economies to report any major changes in the QMS that might affect the NMI capabilities of measurement and service to APMP. Please be advised that the information should be concise but clearly understandable as far as possible.

NMI: .....

Pathway option:

- ☐ A- third party accreditation
- ☐ B- ISO 9001 certification and attestation by technical peers
- ☐ C- attestation by QS experts and technical peers

Review/assessment visit conducted during the year:

Technical Area Reviewed	Dates of Review	Names & Affiliations of Peers (for each area)	Accreditation or Certification Body (if relevant)	Quality System Expert (if Pathway C review)

Information on implementing the Quality Management System and technical capabilities:

Requirement	Response from NMI
Organisation: Changes in key personnel and facilities that could have affected your capability to provide measurement service covering the recognised CMCs and steps taken to address the situation.	
Quality Management System: Any significant changes in quality policies/objectives and/or major Quality Management System developments during the year.	
Complaints/feed backs Any complaints /feed backs from customers.	
Improvement Any Improvement during implementation.	

Requirement	Response from NMI
Intercomparison: Intercomparisons to support CMCs carried out during the year indicate whether Planned, In-progress or Completed	
QMS Coverage of CMCs: Are all CMCs currently in the intra-APMP review stage covered by the QMS?	

Reported by : .....

(Quality Manager)

Date : .....

Appendix 2. APMP QS-1

APMP Quality System Questionnaire: QS1 **(Version 04 April 2003)**

Quality System details to cover CMCs already in the BIPM Database..

If the NMI is following more than one pathway, separate questionnaires should be submitted for each pathway.

If convenient, separate questionnaires may be submitted for each technical area.

NMI submitting QS details:

Contact Person (for further information) Name:

Email:

Phone: Fax:

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1. *What are the CMCs supported by this application?*

2. The "APMP Guidelines For Accepting A Quality System" (available on the APMP website) recognises 3 pathways that could be followed to demonstrate compliance:

   (a) Third party accreditation, or

   (b) Certification to ISO 9001 and attestation by technical peers, or

   (c) Attestation by a team consisting of quality system experts and technical peers, organised through APLAC or a recognised accreditation body.

   Which pathway are you following?

3. *Which standard(s) does your quality system conform to?*

4. Are there any CMCs in this application not covered by your quality system? If so, please identify them. *(If response is lengthy, attach it as a separate document).*

   4.1 Give a time frame when you expect to have the CMCs identified in 4 covered by the quality system.

5. For NMIs following pathway (a):

   5.1 *Name address and fax number of the Accreditation body.*

   5.2 Are there any CMCs in this application not covered by the accreditation? If so, please identify them. (*If response is lengthy, attach it as a separate document*).

   5.3 Give a time frame when you expect to have the CMCs identified in 5.2 covered by the accreditation.

5.4 Please send copies (electronic copies preferred) of:

- Accreditation certificate(s).
- Scope of accreditation.
- Names and affiliations of technical assessors.

Alternatively, give website addresses where this information is available.

6. For NMIs following pathway (b):

6.1 *Name address and fax number of the certification (ISO 9001) body.*

6.2 Are there any areas relevant to the CMCs in this application not covered by the certification? If so, please identify them. *(If response is lengthy, please attach as a separate document)*.

6.3 Give a time frame when you expect the areas identified in 6.2 to be covered by this certification.

6.4 List the names and affiliations of the technical peers.

6.5 Are there any areas relevant to the CMCs in this application that have not been peer reviewed? If so, please identify them. *(If response is lengthy, please attach as a separate document)*.

6.6 *Specify a time frame when you expect the areas identified in 6.5 to be peer reviewed.*

6.7 Please send copies (electronic copies preferred) of:

- Quality (ISO 9001) certificate(s) with details of areas covered by the certification.
- The Review Report* or a Summary Report by the Technical Peers
- Final attestation by the reviewers, or at least the leader of the review team, stating that all the non-conformances have been satisfactorily addressed.

Alternatively, give website addresses where this information is available.

* A Summary Report as in "APMP Guidelines For Accepting A Quality System" is preferred. However, if such a Summary Report is not available, please send the Review Report.

7. For NMIs following pathway (c):

7.1 List the names and affiliations of the technical peers.

7.2 Specify the names and affiliations, qualification and experience of the QS experts.

7.3 Are there any areas relevant to the CMCs in this application that have not been peer reviewed? If so, please identify them. *(If response is lengthy, please attach as a separate document)*.

7.4 Give a time frame when you expect the areas identified in 7.3 to be peer reviewed.

7.5 Please send copies (electronic copies preferred) of:

- The Review Report* or a Summary Report by the Technical Peers.
- Final attestation by the reviewers, or at least the leader of the review team, stating that all the non-conformances have been satisfactorily addressed.

Alternatively, give website addresses where this information is available.

* A Summary Report as in "APMP Guidelines For Accepting A Quality System" is preferred. However, if such a Summary Report is not available, please send the Review Report.

Appendix 3. APMP QS-3

TCQS Reviewer's Report (Version 15-07-2003)

Review of quality system information submitted in support of CMCs

QS Review Number (assigned by APMP Secretariat):

Name of NMI:

TCQS Reviewer's Name:
Email:
Phone: Fax:

Each TCQS Review is done by two members of the Working Group 2 (WG2). Please remember to coordinate your inquiries, and keep the other TCQS Reviewer informed of your findings.

Which pathway is the NMI following to demonstrate compliance with APMP QS Guidelines?

(c) Third party accreditation, or

(b) Certification to ISO 9001 and attestation by technical peers, or

(c) Attestation by a team consisting of quality system experts and technical peers, organised through APLAC or a recognised accreditation body.

A. NMI following pathway (a):

A1. Which standard is the accreditation based upon (ISO 17025, ISO Guide 25, ISO Guide 34, ILAC Guide 12)? *(check QS-1 &/or accreditation certificate)*

A2. Is the NMI accredited by a body operating to ISO Guide 58 and is a signatory to the ILAC or APLAC MRAs? *(check web sites of ILAC, APLAC: see note 1)*

B. NMI following pathway (b):

B1. Which standard(s) is the quality system based upon (ISO 17025, ISO Guide 25, ISO Guide 34, ILAC Guide 12)? *(check QS-1, Peer Review Report or quality certificates)*

B2. Is the NMI certified to ISO 9001 by a certifier operating to ISO Guide 62 and is accredited by a member of the IAF? *(check IAF web site; see note 2)*

B3. Has all the relevant technical requirements of ISO/IEC 17025 (or ISO Guide 34 or ILAC Guide 12) been reviewed by the Review Team? *(check Summary Review Report submitted with QS-1)*

B4. Has the non-conformances identified in the Review Report been satisfactorily addressed? *(need attestation by Peer Reviews; check documents submitted with QS-1)*

C. NMI following pathway (c):

C1. Which standard is the quality system based upon (ISO 17025, ISO Guide 25, ISO Guide 34, ILAC Guide 12)? *(check QS-1 &/or accreditation certificate)*

C2. Was there a quality system expert with accreditation experience on the review team? *(check QS-1 and if necessary confirm with accreditation agency)*

C3. Has all the relevant requirements of ISO/IEC 17025 (or ISO Guide 34 or ILAC Guide 12) been reviewed by the Review Team? *(check Summary Review Report submitted with QS-1)*

C4. Has the non-conformances identified in the Review Report been satisfactorily addressed? *(need attestation by Peer Reviews; check documents submitted with QS-1)*

D. Conclusion

D1. Does the Quality System comply with all the requirements of "APMP Guidelines for Accepting a Quality System", except for the requirement for 'acceptability of technical peers'? *(The relevant Technical Committees will determine the acceptability of the technical peers)*

D2. If not, is the Quality System expected, within a stated time period, to comply with the " APMP Guidelines for Accepting a Quality System"? Give the time period.

D3. Any other comments.

The relevant Technical Committees will determine the acceptability of the technical peers, and also determine which CMCs are covered by the Quality System.

Note 1: Being a signatory to the ILAC or APLAC MRA is confirmation that the accreditation agency operates to ISO Guide 58.

Note 2: Certifiers to ISO 9000 series should be accredited by a national agency. The name of this national agency may be on the certificate or on the web site of the certifier. If this national agency has been accredited by the IAF, that is confirmation that the certifier operates to ISO Guide 62.

Appendix 4. APMP QS-9

Quality System updates in APMP, Status at **th GA

***APMP pathway (a, b, c)**

(a) Third party accreditation, or (b) Certification to ISO 9001 and attestation by technical peers, or (c) Attestation by a team consisting of quality system experts and technical peers. This may be organised by the NMI or another recognised body, such as an accreditation agency or APLAC.

In any pathway, it is required that technical assessors/peer reviewers be selected from NMIs with capabilities similar to or higher than the NMI being assessed/reviewed.

Review No.	Economy	NMI	TC filed	APMP pathway (a,b,c)*	AB name if pathway (a or b)	Is the AB a signatory of the ILAC MRA?	Does QS satisfy ISO17025 or equivalen?	QS Approved by TCQS?	Latest approval of QS acceptability by TCQS	Latest approval CMC coverage by each TC	Note
1	Australia	NMIA	AUV	a	NATA	Yes	Yes	Yes	Sep.6.2005(APMP-TC-C meeting)	Sep.6.2005(APMP-TC-C meeting)	
1	Australia	NMIA	EM	a	NATA	Yes	Yes	Yes	Sep.6.2005(APMP-TC-C meeting)	Sep.6.2005(APMP-TC-C meeting)	
1	Australia	NMIA	L	a	NATA	Yes	Yes	Yes	Sep.6.2005(APMP-TC-C meeting)	Sep.6.2005(APMP-TC-C meeting)	
1	Australia	NMIA	M	a	NATA	Yes	Yes	Yes	Sep.6.2005(APMP-TC-C meeting)	Sep.6.2005(APMP-TC-C meeting)	
1	Australia	NMIA	PR	a	NATA	Yes	Yes	Yes	Sep.6.2005(APMP-TC-C meeting)	Sep.6.2005(APMP-TC-C meeting)	
1	Australia	NMIA	T	a	NATA	Yes	Yes	Yes	Sep.6.2005(APMP-TC-C meeting)	Sep.6.2005(APMP-TC-C meeting)	
1	Australia	NMIA	TF	a	NATA	Yes	Yes	Yes	Sep.6.2005(APMP-TC-C meeting)	Sep.6.2005(APMP-TC-C meeting)	TF-2-2004
1	Australia	NMIA	QM	a	NATA	Yes	Yes	Yes	Sep.6.2005(APMP-TC-C meeting)	Sep.6.2005(APMP-TC-C meeting)	
3	Australia	ARPANSA	RI	a	NATA	Yes	Yes	Yes	Sep.6.2005(APMP-TC-C meeting)	Sep.6.2005(APMP-TC-C meeting)	RI-1-2003,RI-2-2004
5	China	NIM	EM	a+c	CNAL	Yes	Yes	Partly No	Sep.6.2005(APMP-TC-C meeting)	Sep.6.2005(APMP-TC-C meeting)	Additional international peer review report requested
5	China	NIM	L	a+c	CNAL	Yes	Yes	Yes	Sep.6.2005(APMP-TC-C meeting)	Sep.6.2005(APMP-TC-C meeting)	modifications done on 8th December 2004
5	China	NIM	M	a+c	CNAL	Yes	Yes	Partly No	Sep.6.2005(APMP-TC-C meeting)	Sep.6.2005(APMP-TC-C meeting)	Additional international peer review report requested

Appendix 5.

APMP TCEM Guidelines for the Submission and Review of Calibration and Measurement Capabilities

25 February 2011

1. CMC Review Board and Working Groups

TCEM shall appoint a review board to review CMC submissions by APMP member NMIs (intra-RMO review) and by the NMIs of other RMOs (inter-RMO review). The review board is comprised of several working groups, ideally one for each major service category listed in [1]. Each working group (WG) consists of a Chair and several Members. The membership should be approved by the official TCEM representatives of each NMI and by the annual TCEM meeting.

2. Submission of CMCs by APMP NMIs

The submission of new or revised CMCs is accepted once a year before the deadline announced by the TCEM chair.

The NMI submitting its CMCs to the JCRB database should send the following documents to the TCEM chair:
- A full list of the CMCs, including both the existing and modified claims, in the Excel-file for mat recommended by the CCEM and the JCRB.
- A document to prove the conformance of the quality system to ISO 17025.
- The full report of an on-site technical peer review/assessment

The format of the CMC spreadsheet is detailed in [2].

After the submission is closed for the year, the TCEM chair conducts the intra-RMO and the inter-RMO reviews.

3. Intra-APMP Review

Procedure
- The TCEM chair first checks the completeness of the submission against the criteria described in [2].
- The TCEM chair distributes the submission to be reviewed to the Chairs of the WG and to the chair of the APMP Technical Committee on Quality Systems (TCQS).
- Chairs of the WG distribute the CMCs appropriate to their group to the WG members of their choice.
- The members of the WG are requested to send the review comments to the WG chair and the relevant NMI, if necessary, well before the deadline announced by the chair.
- The WG chair overseas the review process for his/her service category and, upon completion, sends the final CMC spreadsheets to the chair of the TCEM.
- The TCEM chair makes the final decision of approval based on the review comments and the revision of the submitted NMI.
- The TCEM chair submits the approved submissions to the JCRB for the inter-RMO review.

The Review Criteria are described in [3-5].

4. Instructions for Chairs of Working Groups

You will receive from the TCEM Chair the CMC Spreadsheet to be reviewed, other items listed in Section 2 and the deadline for the completion of the review.

If the spreadsheet does not contain this already, create a heading in the last columns (usually columns Z to AE for Intra-RMO Review) with a green coloured background, as shown below:

For Intra-RMO Review

	Z	AA	AB	AC	AD	AE
1	Intra-APMP Review					
2	**Intra-APMP Reviewer's 1st Comments**	NMI's reply to the Reviewer's 1st comments	**Intra-APMP Reviewer's 2nd Comments**	NMI's reply to the Reviewer's 2nd comments	**Intra-APMP Reviewer's 3rd Comments**	**Column used by APMP TCEM chair. Intra-APMP Review Conclusion (OK / modified OK / no agreement)**

For Inter-RMO Review

APMP review		
Review Status	Reviewer's Comment	NMI answer

Find in the CMC spreadsheet the rows corresponding to your service category requiring a review [9]. The CMCs requiring review are those of category (c), i.e. "CMCs modified to change the method of measurement or to reduce the uncertainty or to increase the scope". Mark these rows under the heading you made, with the same green coloured background.

Rename the spreadsheet to **RMO_Country_EM_Service Category_date_** (insert just the major service category and use yymmdd for the date format).

Select a reviewer from the current APMP CMC Review Board listing. Email the following to the selected reviewer (with cc: to TCEM Chair)

For Inter-RMO Review:
1. The CMC spreadsheet
2. Other Materials from the NMI under review listed in Section 2 above
3. Electronic copies of [7-10]
4. Instructions for Reviewers

For Intra-RMO Review:
1. The CMC spreadsheet
2. Electronic copies of [7-10]
3. Instructions for Reviewers

Below is the suggested text of the email

Dear xxx,

As you may be aware, APMP TCEM is conducting an Intra-APMP CMC review. Accordingly, I would like to ask you and/or your colleagues to review the following CMCs submitted for review by the APMP TCEM member NMIs:

RMO_Country_EM_Service Category_date

Attached are the CMC file(s) submitted to be reviewed and QS information supporting the CMCs. The NMI contact person is ***Name and Email Address of the NMI Contact Person***

According to the APMP guidelines, duration of the review should be no more than two months. Therefore **two weeks turn-around time is suggested** for the reply to this request.

I thank you very much in advance for cooperating in the present intra-APMP CMC review.

===== Instructions for reviewers =========

Oversee the communication between the reviewer and NMI. Communicate with both as necessary. If a delay occurs, ask for action.

When the process is complete email the following to the TCEM Chair:

1. Final CMC spreadsheets
2. Number of CMCs Reviewed / Approved / Not Approved for each country (NMI)

5. Instructions for Reviewers

The attached EXCEL files are usually customised to be used between the NMI and the reviewer of a specific service category.

Please open the sheet "CMC" which is the parent CMC list in the Excel file. Please look up columns marked **“APMP review”** and find the rows with green-coloured-background cells. The items of such rows shall be reviewed by the assigned reviewer. If there are no such rows contact the WG Chair for the particular service identifiers to be reviewed.

The following font colours are used in the spreadsheet: **Black font** is used for description that has not changed from the CMC list of this NMI already registered in KCDB. **Red font** is used for corrections or modifications of the existing CMCs or new entries that requires your technical review.

Please write your first comments in column **"reviewer’s comments" of "APMP review"**, change the name of the file to RMO**_country code_EM_service category_yymmdd** (where "yymmdd" should be replaced by the date of your review) and send the file to the **NMI contact person in the cc: field of the accompanying email and also cc: to the WG Chair.**

Please make the file name "RMO_country code_EM_service category_yymmdd" the email subject (title). To write additional text besides your message in Reviewer’s comments columns prepared in the "CMC" sheet, please add a sheet at the end entitled "Letter". (At the end of the review, I would like to have all messages recorded in this EXCEL book.)

When you receive the reply from the NMI, write your 2nd comments in the next column, and repeat the procedure. When you decide that the NMI's claim is acceptable for publication in KCDB, please **write "OK" and "your name" in the comments cell** in the "CMC" sheet. If you conclude that you disagree with NMI's claim then please write "Disagree". When the review of all items is over, please send me a last email with file attached, and write "**Review is over**" as the email subject (title).

Before commencing the reviews, reading the following documents and understanding the "Criteria", "Procedures" and "Rules" is recommended.

1. "APMP Procedure for CMC entry in Appendix C (APMP-G1 ver.4)"
2. "APMP Guidelines for acceptance of data for Appendix C (APMP G-3)"
3. "EM Supplement Guide for CMCs.pdf"

If you have any questions, please do not hesitate to contact the WG Chair or the TCEM Chair.

6. Inter-RMO Review

Procedure
- The TCEM chair decides which CMC submission is to be reviewed from the JCRB database.
- The TCEM chair first checks the completeness of the submission and the indication of the quantities to be reviewed. If required, the TCEM chair can contact the submitting RMO to get more information.
- The TCEM chair distributes the submission to be reviewed to the chair of the WG for review by the WG members.
- The rest of the procedure is the same as in Section 4.

Review Criteria are the same as for Intra-RMO Review.

References

1. CLASSIFICATION OF SERVICES IN ELECTRICITY AND MAGNETISM, Version No 7.4
2. CIPM MRA-D-04, Calibration and Measurement Capabilities in the context of the CIPM MRA
3. CIPM MRA-G-02, JCRB guidelines for the monitoring and reporting of the operation of quality systems by RMOs
4. CIPM MRA-G-03, Guidelines for the review of CMCs and the monitoring and reporting of the operation of quality systems by international intergovernmental organizations who are signatories of the CIPM MRA
5. JCRB-11/7(a), Monitoring the impact of key and supplementary comparison results on CMC claims
6. CCPR-WGCMC-08/03, Table of supporting comparisons for CMCs (templates for CMC submission)
7. APMP Procedure for CMC entry in Appendix C (APMP-G1 ver.4)
8. APMP Guidelines for acceptance of data for Appendix C (APMP G-3)
9. EM Supplement Guide for CMCs.pdf
10. CLASSIFICATION OF SERVICES IN ELECTRICITY AND MAGNETISM

Appendix 6.

APMP TCPR Guidelines for CMC Submission and Review

Drafted by APMP TCPR

Lead author: Dr. Dong-Hoon LEE (KRISS)

30 October, 2010

1. MOTIVATION

To provide the terms of reference for WG CMC
To provide a uniform procedure of CMC submission
To provide a uniform criteria of CMC review (intra-and inter-RMO)

2. WG-CMC

The TCPR builds a working group (WG) to review the submission of the member NMIs of APMP (intra-RMO review) and to review the submission of the NMIs of other RMOs (inter-RMO review).

Membership
- The members of the WG CMC should be the members of the TCPR of APMP.
- The chair of the TCPR is the chair of the WG CMC who is responsible to organize and operate the WG CMC.
- The number of the WG CMC members is limited to 10.
- The membership should be approved and renewed by the annual TCPR meeting.
- The membership belongs to the NMI, not to a person. Each member NMI should assign a representative person for the WG CMC.

3. Submission of CMC

The submission of CMC is accepted once a year before the time limit announced by the TCPR chair.

The NMI submitting its CMC to the JCRB database should send the following documents to the TCPR chair:
- A full list of the CMC, including both the existing and modified claims, in the Excel-file format recommended by the CCPR and the JCRB.
- A document to prove the conformance of the quality system to ISO 17025.
- Results of the comparisons as supporting evidence of each quantity on the list. (This can be omitted if the comparison results are published in the BIPM database.)

In the list of the CMC, each quantity should be indicated to be one of the following groups:
- New and modified claims: indicated by red bold characters. The quantities in this group will be reviewed by the WG CMC and also by other RMOs. After a successful review, they will be published in the JCRB database with the date of approval.
- Removal: indicated by red background. The quantities requested to be removed from the CMC list by the NMI can be submitted to the JCRB by the TCPR chair without review.
- No change: without any indication. For the quantities in this group, no action is applied by the submission, and their approval date in the JCRB database will not be updated.
- Renewal: indicated by black bold characters. For the quantities of this group, a re-assessment of the quality system has confirmed their conformance without change. They can be submitted to the JCRB by the TCPR chair without review, and will be published in the JCRB database with the updated date of approval. However, if the quantities belong to the KC quantities, the TCPR chair can check if the supporting key comparisons still keep their validity. In case that the NMI did not participate to

the available key comparison, the related quantities should be changed to the group of “No change” without update in the JCRB database.

For the quantities of a NMI which are not renewed for more than 7 years so that the validity of the quality system and the equivalence is suspicious, the TCPR chair can submit, under the approval of the TCPR, the removal of these quantities from the JCRB database.

After the submission is closed for the year, the TCPR chair conducts the intra-RMO and the inter-RMO reviews.

4. Intra-RMO Review

Procedure
- The TCPR chair first check the completeness of the submission and the indication of the quantities to the different groups described in 3.3. For the quantities in the group of “Renewal” in particular, the validity of the supporting key comparisons should be checked.
- The TCPR chair distributes the submission to be reviewed to the members of the WG CMC.
- The members of the WG CMC are requested to send the review comments to the TCPR chair within the time limit announced by the chair. Only the quantities belonging to the groups “New and modified claims” and “Renewal” are to be reviewed.
- The chair collects the review comments of the WG CMC members and, if required, forwards them anonymously to the submitted NMI for revision.
- The TCPR chair makes the final decision of approval based on the review comments and the revision of the submitted NMI. The chair sends the decision to the submitted NMI and also to the members of the WG CMC.
- The TCPR chair submits the approved submissions to the JCRB for the inter-RMO review.

Review Criteria
- The claims should be formulated as defined in the up-to-date version of the service category of photometry and radiometry.
- To each quantity, at least one key/supplementary comparison should be assigned as a supporting evidence of the claim. The list of the supporting comparisons required for each quantity is decided by the WG CMC of CCPR and its up-to-date version should be made accessible on the BIPM or JCRB website.
- In order to be a valid evidence, the supporting comparison should be published on the KCDB of the BIPM at the time of the CMC submission. The draft B report can be regarded as “published”. However, in case that the publication of the comparison results is delayed for more than 1 year after the measurement has been finished, the NMI can submit the CMC claim based on a preliminary result of its DoEreported by the comparison pilot laboratory.
- The claims should be consistent with the results of the supporting comparisons. The claimed uncertainty, for instance, should be larger than the degree of equivalence (DoE) of the claiming NMI in the supporting comparisons.

5. Inter-RMO Review

Procedure
- The TCPR chair decides which CMC submission is to reviewed from the JCRB database.
- The TCPR chair first check the completeness of the submission and the indication of the quantities to be reviewed. If required, the TCPR chair can contact the submitting RMO to get more information.
- The TCPR chair distributes the submission to be reviewed to the members of the WG CMC.
- The members of the WG CMC are requested to send the review comments to the TCPR chair within the time limit announced by the chair.

Review Criteria
- In principle, the same criteria for intra-RMO review are applied.

- On request of the TCPR chair, some special conditions of the submitting RMO can be additionally considered.

References

11. CIPM MRA-D-04, Calibration and Measurement Capabilities in the context of the CIPM MRA
12. CIPM MRA-G-02, JCRB guidelines for the monitoring and reporting of the operation of quality s ystems by RMOs
13. CIPM MRA-G-03, Guidelines for the review of CMCs and the monitoring and reporting of the op eration of quality systems by international intergovernmental organizations who are signatories of the CIPM MRA
14. JCRB-11/7(a), Monitoring the impact of key and supplementary comparison results on CMC clai ms
15. CCPR-WGCMC-08/03, Table of supporting comparisons for CMCs (templates for CMC submissi on)