



Asia Pacific Metrology Programme

**APMP approach in quality systems and specifics
November 2017**

Dr Ilya Budovsky

APMP TCEM Chair 2008-2012

Inaugural APMP Lead TC Chair 2009-2012

Chair, CCEM Working Group on RMO Coordination since 2015

National Measurement Institute Australia

**Sound Beginning in the CIPM MRA
Paris – France**

Contents

- **APMP: Introduction & Mission, History, Membership, and Structure**
- **Principles of APMP Quality Systems Approach**
- **APMP Technical Committees**
- **APMP Comparisons**
- **Progress of APMP Focus Groups**



Regional Metrology Organisations



Regional Metrology Organisations

- Regional Metrology Organisations (RMOs) are a regional grouping of national or peak laboratories established to:
 - Develop metrology within geographical / economic regions
 - Establish mutual confidence
 - Establish the degree of equivalence between national measurement standards



APMP: Introduction & Mission

- APMP is a grouping of national metrology institutes (NMIs) from the Asia-Pacific region engaged in improving regional metrological capability through the sharing of expertise and exchange of technical services among Member laboratories.
- APMP is also a Regional Metrology Organization (RMO) recognized by the International Committee for Weights and Measures (CIPM) for the purpose of worldwide mutual recognition of measurement standards and of calibration and measurement certificates.
- APMP's mission is to promote and support a measurement infrastructure in the Asia-Pacific region that:
 - facilitates international trade
 - improves industrial efficiency and competitiveness
 - ensures equity in the marketplace
 - enhances quality of life and the environment.



APMP: History

- APMP was originally established in 1977 as the Commonwealth Science Council Regional (Asia/Pacific) Metrology Programme.
- Membership was limited to Commonwealth nations of the Asia/Pacific region.
- In 1980, membership was broadened outside the Commonwealth nations of the Asia/Pacific region, and the name of the organisation was changed to the Asia Pacific Metrology Programme (APMP).



APMP: Objectives

- To develop a closer **collaboration** between members in work on **measurement standards** within the region.
- To improve metrology within the region and gain **international recognition** for members.
- To encourage traceability between members through the provision of **calibration services**.
- To ensure that measurement standards within the region are traceable to standards maintained or co-ordinated by the BIPM in **the realisation of the SI units**.
- Co-ordinate projects on measurement standards and foster **co-operation** in research between member economies.
- **Transfer knowledge** in the field of primary or peak standards between members through seminars, conferences, workshops, and training programs.

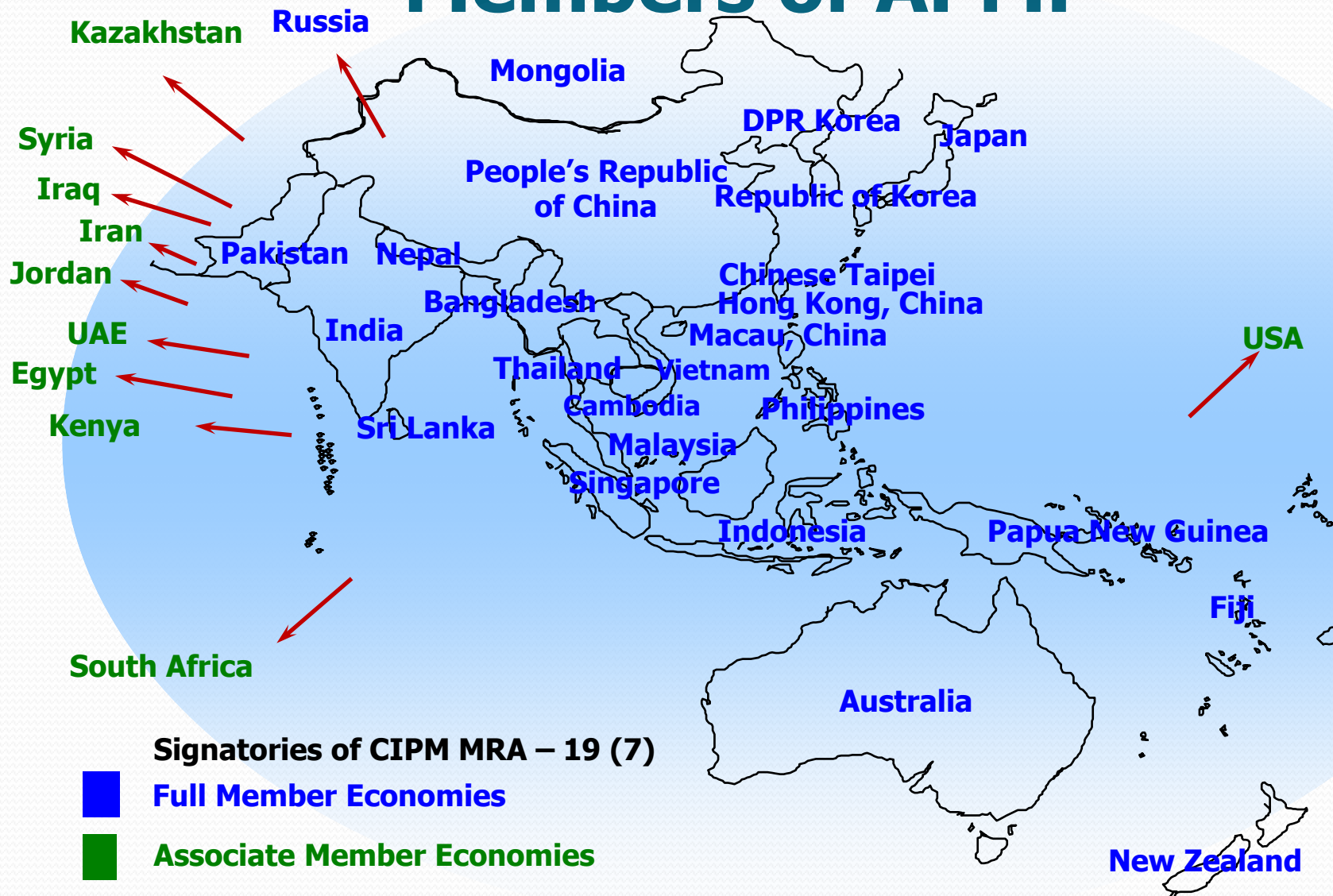


APMP: Objectives

- Encourage and facilitate collaboration amongst members on specific projects.
- Give special attention to the **needs of less developed members** and initiate, develop, and implement activities to assist them in achieving metrological capability in specific activities.
- Establish and maintain effective **links with other international** and region based metrological **bodies**.
- **Collaborate with other bodies within the Asia/Pacific** region that are active in standards, testing, and conformance.
- Encourage **participation in the CIPM MRA**.



Members of APMP



Strategic Initiatives

TC Initiatives: The APMP TC Initiatives budget is aimed at fostering R&D projects of significance in addressing current needs of industry.

“Focus Group” (FG) strategy:

Aimed at developing capabilities and increasing impact of measurement in addressing regional challenges in support of government, industry, innovation and research.

- **Energy Efficiency** (Mr Prayoon Shiowattana, NIMT, Thailand, prayoon@nimt.or.th)
- **Food Safety** (Ms Li Hongmei, NIM, China, lihm@nim.ac.cn)
- **Medical Metrology** (Dr Sheng-Jui Chen, CMS/ITRI, Chinese Taipei, SJ.Chen@itri.org.tw)
- **Climate Change** (Dr Jin Seog Kim, KRISS, Korea, jkim@kriss.re.kr)
- **Clean water** (Dr Mego Penandito, KIM-LIPI, Indonesia, mego@kim.lipi.go.id)



APMP: Regional Challenges

- APMP covers a **vast geographical area** – Pakistan to Fiji and Mongolia to New Zealand.
- “Getting the balance right” - there are a range of development needs across APMP – **developing economies vs developed economies**.
- APMP works across **four sub-regional groupings**:
 - ASEAN (Association of South East Asian Nations)
 - SAARC (South Asian Association for Regional Cooperation)
 - APEC (Asia Pacific Economic Cooperation)
 - PIF (Pacific Islands Forum)



APMP Structure

General Assembly (**GA**)
Member laboratories from 32 economies

APMP Executive Committee (**EC**)

APMP Secretariat

APMP Technical Committee (TC)
Chairs (TCC) (*Lead TC Chair*)

APMP Developing Economies'
Committee (**DEC**)

APMP Technical Committees (**TCs**):
TCAUV, TCEM, TCFF, TCL, TCM, TCMM,
TCPR, TCQM, TCQS, TCRI, TCT, TCTF

APMP Focus Groups (FGs)

- Energy Efficiency
- Medical Diagnostic Equipment
- Climate Change
- Food Safety
- Clean Water



Updates and Highlights

November 2016

- Appointment of **Dr Toshiyuki Takatsuji** (Japan) as APMP Chair
- Election of 1 new Executive Committee member:
 - **Ms Gao Wei** (China)
- 3 new Technical Committee (TC) Chairs took office:
 - TCFF: **Dr Takashi Shimada** (Japan)
 - TCMM: **Dr Victoria Coleman** (Australia)
 - TCRI: **Dr Jinjie Wu** (China)
- New APMP Secretary: **Dr Takehiro Morioka** (Japan)



Support for Developing Economies

PTB “MEDEA” project: (4th year of 4-year program)

APMP-specific activities include training workshops in:

- Workshop on GNSS Receiver Calibration Project (October 2017, Chinese Taipei)
- Workshop on National Metrology Infrastructure (May 2017, Malaysia)
- Laser Interferometers for Length Measurement (October 2016, Japan)
- Training attachments in chemical measurement

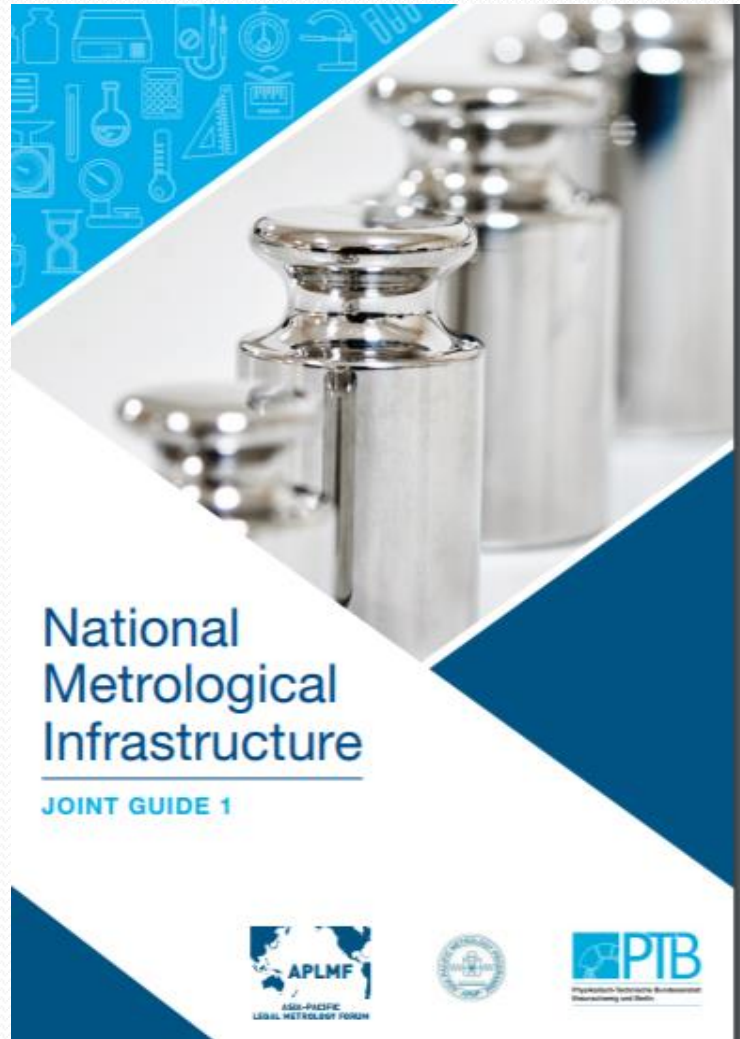
APMP member participation in BIPM Capacity Building & Knowledge Transfer (CB&KT) Programme

- APMP had 2 participants in the CB&KT 2016 “Leaders of Tomorrow” CIPM MRA Workshop
- NIM, China, is working with the BIPM and NMISA (South Africa) on the “Metrology for Safe Food and Feed in Developing Economies” capacity building project



Joint Guide on National Metrological Infrastructure

http://www.apmpweb.org/documents/file/jointguide_20170829.pdf



Principles of APMP Quality Systems Approach

Reference – *APMP-QS2*

Basic Requirement - evidence of:

- 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
- **technical competence** to provide a calibration and measurement service that can deliver the uncertainties claimed.



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Principles of APMP Quality Systems Approach

Reference – APMP-QS2

Three Pathways:

- (a) **Third party accreditation** (technical assessors must meet criteria given for technical peers)
- (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.



Principles of APMP Quality Systems Approach

Three Pathways:

Pathway a)

The accreditation body must be operating to ISO/ IEC 17011:2004 and be a signatory to the APLAC or ILAC MRAs.

Pathway b)

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.

KRISS, Korea is the only NMI using Pathway b)



Principles of APMP Quality Systems Approach

Technical Peers:

Pathways a), b) and c)

- 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. This acceptance be obtained by the applicant NMI from the relevant TC in advance using an approved form (see APMP QS2)
- 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.



Principles of APMP Quality Systems Approach

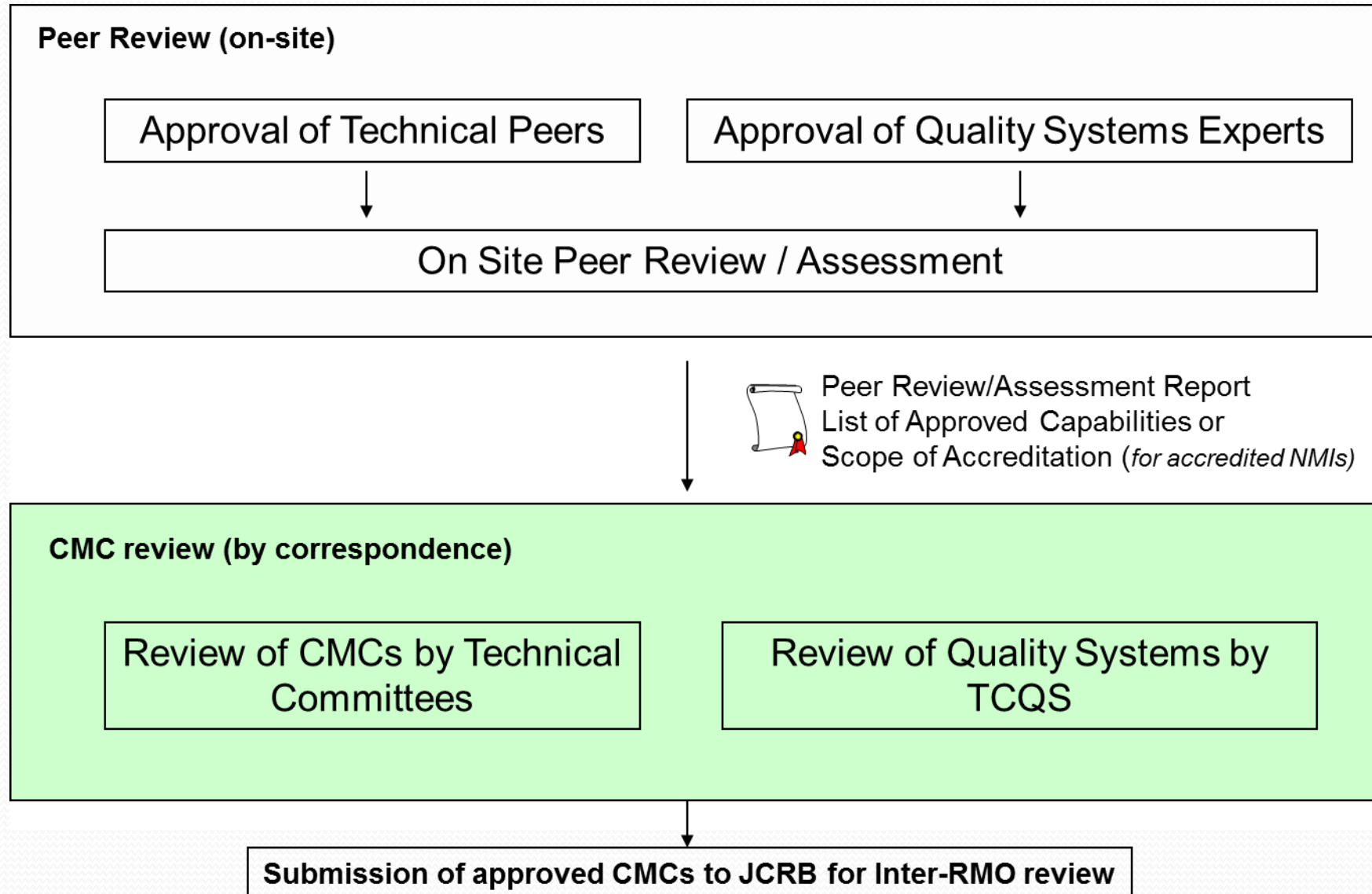
Technical Peers:

Pathways a), b) and c)

- Technical assessors/ technical peers are selected from NMIs with capabilities similar to or higher than the NMI being assessed/reviewed.
- 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.



APMP CMC Review Process



APMP CMC Review Process

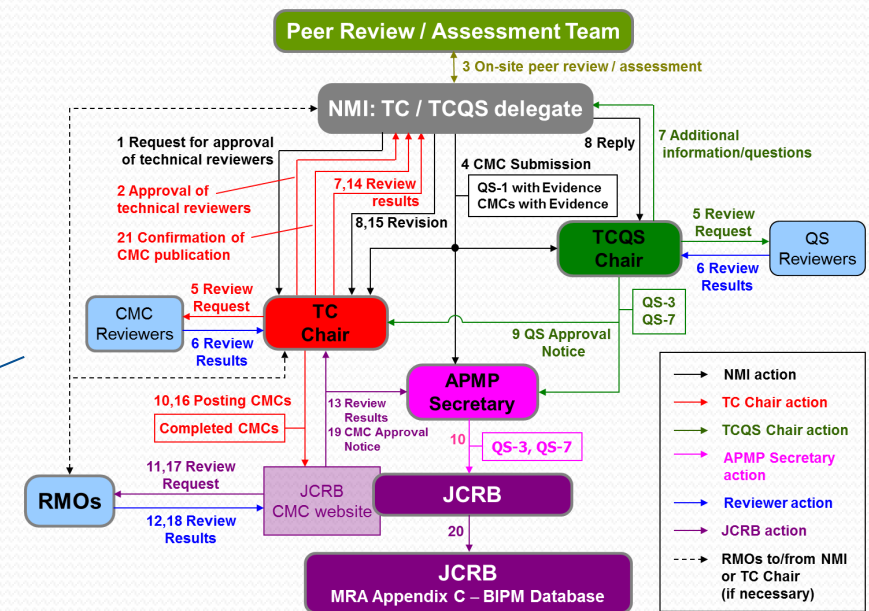
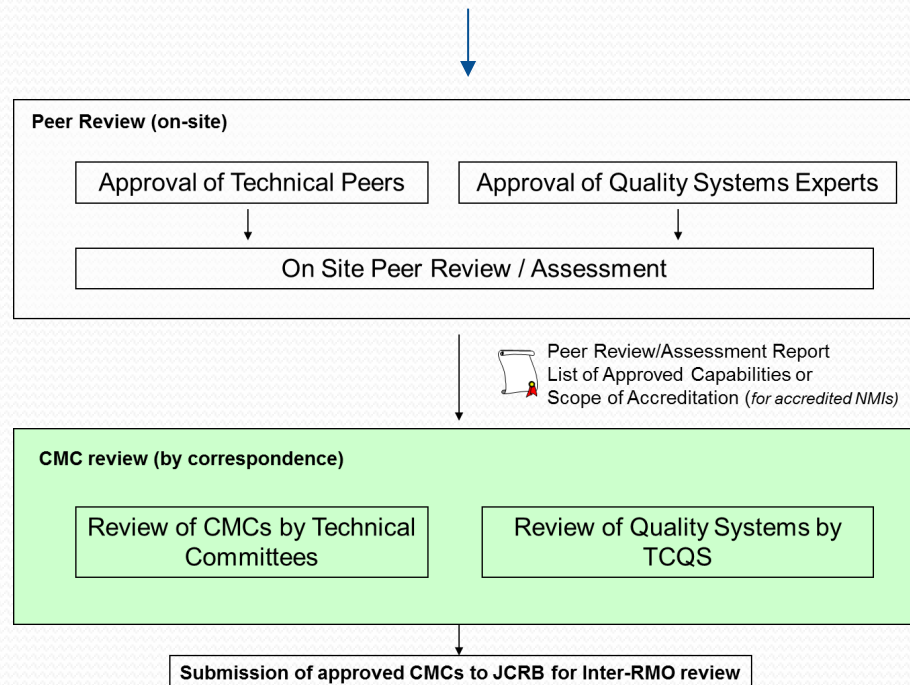
- APMP places great reliance on the [on-site technical reviews](#) of technical capabilities and quality systems as part of the essential evidence to support the CMCs of any NMI. All proposed and existing CMCs, and the supporting quality system undergo an on-site peer review prior to their submission for intra-RMO review
- The [technical experts](#), chosen in accordance with the relevant guidelines, must be [approved in advance](#) by the corresponding APMP technical committee – fully complies with the CIPM-ILAC Guide on the accreditation of NMIs and CIPM/2007-25.
- On-site peer review must be completed (peer review/assessment report finalized) before CMC review by correspondence can commence.
- CMCs must be fully compatible with the peer review report.
- Peer assessors have an opportunity to study the evidence in great detail
- Less reliance on subsequent CMC review by correspondence.
- Helps maintain vitality and 5-year reviews



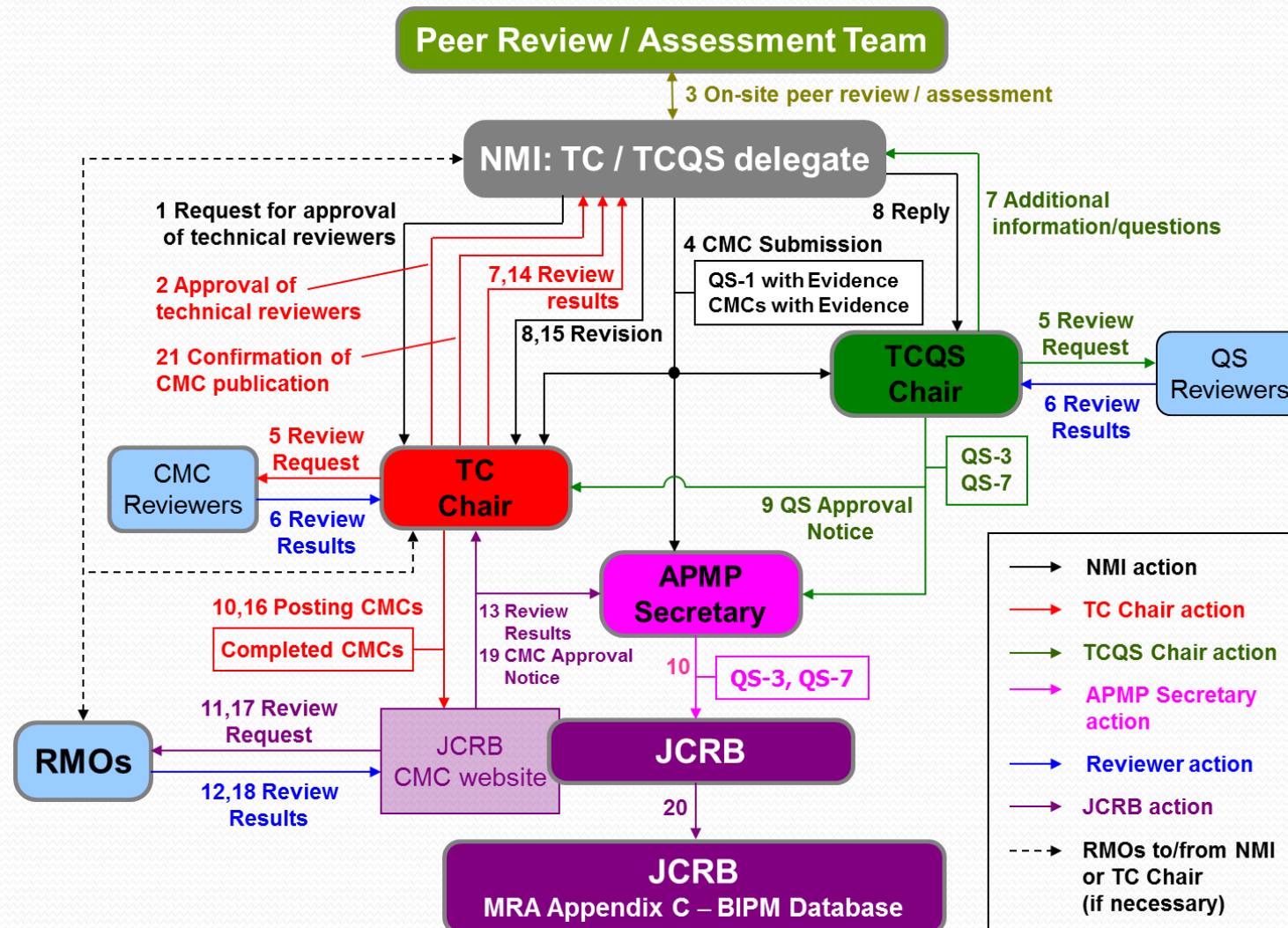
APMP CMC Review Process

Capacity Building + Evidence

Comparisons, publications, RMO projects **CIPM MRA-D-o4**



APMP CMC Review Process



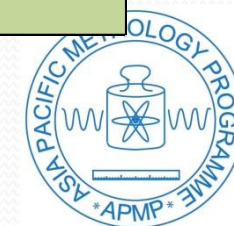
APMP Technical Committees

- TCL : for Length
- TCM : for Mass and Related Quantities
- TCTF : for Time and Frequency
- TCEM : for Electricity and Magnetism
- TCT : for Thermometry
- TCPR : for Photometry and Radiometry
- TCRI : for Ionising Radiation
- TRQM : for Amount of Substance
- TCAUV : for Acoustics, Ultrasound and Vibration
- TCFF : for Fluid Flow
- TCQS : for Quality Systems
- TCMM : for Materials Metrology



APMP Technical Committees

	Taipei	Daejeon	Beijing	Da Nang	TBA	TBA	TBA
	2013	2014	2015	2016	2017	2018	2019
Lead TC Chair	Toshiyuki Takatsuji, NMIJ, JP		Peter Manson NMIA, AU				
DEC	Mego Pinandito, KIM-LIPI, ID			Prayoon Shiowattana, NIMT, TH			
AUV	Sun Qiao, NIM, CN			Huang Yu-Chung, CMS/ITRI, Chinese Taipei			
EM	Nobu-hisa Kaneko, NMIJ, JP			Murray Early, MSL, NZ			
FF	Yoshiya Terao, NMIJ, JP	Yong Moon Choi, KRISS, KR			Chun-Min Su, CMS-ITRI, Chinese Taipei		
L	Toshiyuki Takatsuji, NMIJ, JP		Chu-Shik Kang, KRISS, KR				
M	Tokihiko Kobata, NMIJ, JP			Shih Mean Lee, NMC-A*STAR, SG			
PR	Peter Manson, NMIA, AU			Tatsuya Zama, NMIJ, JP			
QM	Euijin Hwang, KRISS, KR			Ma Liandi, NIM, China			
QS	Jongseun Park, KRISS, KR			Isao Kishimoto, NMIJ, JP			
RI	Yang Yuandi, NIM, CN	Chul-Young Yi, KRISS, KR			Jinjie Wu, NIM, CN		
T	Yong-Gyoo KIM, KRISS, KR			Li Wang, NMC-A*STAR, SG			
TF	Huang-Tien LIN, Chunghwa Telecom, Chinese Taipei		Michael Wouters, NMIA, AU				
TCMM	Seong Jai Cho, KRISS, KR	Toshi Fujimoto, NMIJ, JP			Victoria Coleman, NMIA, AU		



APMP Comparisons

[http://www.apmpweb.org/main/APMP Intercomparisons list 20170518.xlsx](http://www.apmpweb.org/main/APMP_Intercomparisons_list_20170518.xlsx)

Example: TCEM Comparisons

List of international comparisons relevant to APMP									
PLEASE NOTE: Participation in international comparisons may be restricted in some cases by the laws and policies of the economies that provide the pilot laboratories and transfer standards.									
Name of TC	TCEM	Last updated	2017/May/17						
Identifier	Type	Measurand	Range	Start	End	Pilot	Participants	Call for participation	Remarks
(Add P for tentative ones)	(Select one)			(Year)	(Year)	(Lab, economy)		(Select one)	
APMP.EM-K1.1P	Key	DC resistance/Standard resistor	1 Ω and 10 k Ω	2017		NOT FINALIZED	NOT FINALIZED	Not yet	NIMT may be able to pilot, artefacts required
APMP.EM-K2	Key	DC resistance/Standard resistor	100 M Ω and 1 G Ω	2010		KRISS	NMIA, NIM, CMS, SCL, KRISS, NML-SIRIM, MSL, VNIIM, NMC, NMISA, NIMT	Closed	Draft A completed, Draft B in progress
APMP.EM-K3P	Key	Inductance/Standard Inductor	10 mH at 1 kHz	tba		NOT FINALIZED	NOT FINALIZED	Not yet	Not started, suspended at present
APMP.EM-K5.1	Key	AC power at 50 Hz/60 Hz	Power factor: 1.0, 0.5 Lead, 0.5 Lag, 0.0 Lead, 0.0 Lag	2010		KRISS	CMS, JEMIC, MASM, MSL, NIM, NIS, A*STAR, NMIA, SIRIM, SCL, NIMT	Closed	Measurements completed. Draft A in preparation
APMP.EM-K12	Key	AC-DC current transfer standards	Frequency: 10 Hz, 55 Hz, 1 kHz, 10 kHz, 20 kHz, 50 kHz and 100 kHz	2014		NMC	KRISS, MSL, NIM, NIMT, A*STAR, NMIA, NMIIJ, NMISA, SIRIM, SCL, VMI	Closed	Measurements completed. Draft A by end of 2017
APMP.EM.BIPM-K11.2	Bilateral	DC Voltage Standard	10 V	tba		KIM-LIPI	KIM-LIPI, SPRING	Closed	Suspended at present
APMP.EM.BIPM-K11.3	Key	DC Voltage Standard	1.018 V and 10 V	2009		KRISS	KRISS, NMIA, NMC, NML-SIRIM, CMS, NMIIJ, NIMT, BIPM, SCL, NPLI, NMISA, NIS, VNIIM	Closed	Draft B submitted
APMP.EM.BIPM-K11.5	Key	DC Voltage Standard	1.018 V and 10 V	2013		NMIJ	NMIJ, KRISS, CMS	Closed	Draft B prepared
APMP.EM.RF-K8.CL	Key	Power in 50 ohm coaxial lines	Frequency: 10 MHz, 50 MHz, 1 GHz, 4 GHz, 8 GHz, 12 GHz, 15 GHz, and 18 GHz	2012		NMIJ	NMIJ, NMIA, NIM, NPLI, KRISS, NML-SIRIM, MSL, NIMT, A*STAR, NMISA, SCL	Closed	Measurements completed. Draft A in preparation
APMP.EM.RF-S5.CL	Supplementary	Characteristic impedance of coaxial air lines		2013		NMIJ	NIM, LNE, PTB, KRISS, A*STAR, METAS, NPL, NIST, NMIA, NMIJ	On going	Protocol accepted but suspended at present
APMP.EM.RF-S6.CL	Bilateral	S-parameters, type-N	2 GHz to 18 GHz	2014		NMIJ	NMIJ, MSL	Closed	Protocol accepted but suspended at present
APMP.EM-S8	Supplementary	Comparison on digital multimeter	6.5 Digit Multimeter	2011		NPLI, India plus supportig NMIs	ITDI, JNMI, KazInMetr, KIM-LIPI, MASM, MUSSD, NIMT, NIS, NISIT, NMIA, NMISA, SIRIM, NPLI, NSCL, SCL, VMI	Closed	Measurements completed. Draft A in preparation
APMP.EM-S10P	Supplementary	Inductance/Standard Inductor	100 mH at 1 kHz	tba		NPLI, India	NOT FINALIZED	Not yet	Suspended at present
APMP.EM-S13P	Supplementary	DC current	3000 A DC	tba		NPLI, India	NOT FINALIZED	Not yet	Suspended at present
APMP.EM-S12	Supplementary	DMM meter	DCV, ACV, DCI, ACI, R	2014		NMIA, Australia	NOT FINALIZED	On going	Measurements completed, Draft A in preparation
APMP.EM.RF-S21.F	Supplementary	Comparison of antenna factors	Frequency: 10 kHz to 30 MHz	2013		NMIJ	NMIJ, KRISS, NMIA	Closed	Draft A completed, Draft B in progress
APMP.EM-P1P	Pilot Study	DC resistance/Standard resistor	100 Ω	2013		NMIJ, Japan	NMIJ, NIST, KRISS, NMC	Calling	On going, only with QHR+CCC, carnet is a must, not registered

Some comparisons are aimed at developing NMIs, for example APMP.EM-S8 Comparison on digital multimeter



On-going monitoring of QMS by the TCQS

- 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.



Status of APMP Quality Systems

Economy	APMP Full MemberNMI/DI	Quality System				Pathway	CIPM MRA Appendix C								
		17025	9001	Guide 34	17043		A U V	E M	L	M	P R	R I	T	T F	Q M
Australia	NMIA	✓	✓	✓	✓	a	✓	✓	✓	✓	✓		✓	✓	✓
	ARPANSA	✓				a						✓			
	ANSTO											✓			
Bangladesh	NML-BSTI														
	DRiCM														
China	NIM	✓		✓		a,c	✓	✓	✓	✓	✓	✓	✓	✓	✓
Chinese Taipei	CMS/ITRI	✓	✓	✓	✓	a	✓	✓	✓	✓	✓		✓		✓
	INER	✓				a						✓			
	Chunghwa T	✓				a								✓	
Hong Kong, China	SCL	✓			✓	a	✓	✓	✓	✓			✓	✓	
	GL	✓		✓		c									✓
India	NPLI	✓			✓	c	✓	✓	✓	✓	✓		✓	✓	✓
	BARC														
Indonesia	RCM-LIPI	✓				a	✓	✓	✓	✓			✓	✓	
	RCChem-LIPI	✓		✓	✓	a									
Japan	NMIJ/AIST	✓		✓		a	✓	✓	✓	✓	✓	✓	✓	✓	✓
	NICT	✓				a								✓	
	CERI	✓		✓		a									✓
	JEMIC	✓				a		✓							
Korea (Republic of)	KRISS	✓	✓	✓		b	✓	✓	✓	✓	✓	✓	✓	✓	✓



Status of APMP Quality Systems

Economy	APMP Full MemberNM I/DI	Quality System				Pathway	CIPM MRA Appendix C								
		17025	9001	Guide 34	17043		A U V	E M	L	M	P R	RI	T	TF	Q M
Malaysia	NML-SIRIM	✓				a	✓	✓	✓	✓	✓		✓	✓	
	NUCLEAR MALAYSIA	✓	✓			A						✓			
Mongolia	MASM	✓	✓		✓	a									
New Zealand	MSL	✓				a		✓	✓	✓	✓		✓	✓	
Philippines	NML-ITDI	✓				a				✓			✓		
Russia*	VNIIM														
Singapore	A*STAR	✓				c		✓	✓	✓	✓		✓	✓	
	HSA	✓		✓	✓	c									✓
Thailand	NIMT	✓	✓			a,c	✓	✓	✓	✓	✓		✓	✓	✓
	DSS														
	TISTR	✓	✓			a									
	OAP	✓				a									
Viet Nam	VMI	✓				a,c			✓				✓	✓	



APMP QS Documents

<http://www.apmpweb.org/documents/qsdocuments.php>

[\[TCQS\] APMP-QS₁](#) : Questionnaire QS₁

[\[TCQS\] APMP-QS₂ \(PDF\)](#) : APMP Guidelines for Accepting a Quality System

[\[TCQS\] APMP-QS₂ \(Word\)](#) : APMP Guidelines for Accepting a Quality System

[\[TCQS\] APMP-QS₂-Annex](#) : APMP CMC Workflow Diagram

[\[TCQS\] APMP-QS₈](#) : Flow Chart for annual review for the QS status and CMC coverage of each NMI at GA

[\[TCQS\] APMP-QS₃](#) : TCQS Reviewer\'s Report (Report template)

[\[TCQS\] APMP-QS₆](#) : CMC Reviewer\'s Report (Report template)

[\[TCQS\] APMP-QS₇](#) : QS Reviewer\'s Report (Report template)

[\[TCQS\] APMP-QS₉](#) : Quality System updates in APMP



CIPM MRA Review

- BIPM-led review of CIPM MRA – the global mutual recognition arrangement in scientific measurement
- APMP input addressed the following questions:
 - What outcomes do your NMI and your stakeholders require from the CIPM MRA?
 - What is the value of the CIPM MRA to you and your stakeholders?
 - What changes to the CIPM MRA would increase that value?
 - What are your views on proposals for changes to the CIPM MRA made by other bodies?



Combined Peer Review and Intra-RMO Review – APMP TCEM Pilot Study

Calibration or Measurement Service			Measurand Level or Range			Measurement Conditions Independent		Expanded Uncertainty				Reference Standard used in calibration		List of Comparisons supporting this measurement/calibration service	Comments to be published in the KCDB	NMI Service Identification	Service category	NMI	Uncertainty Matrix	Tag for closely related CMCs	Review Status (OK / modified OK / no agreement)	Intra-APMP Review		
Quantity	Instrument or Artifact	Instrument Type or Method	Minimum value	Maximum value	Units	Parameter	Specifications	Value	Units	Coverage Factor	Level of Confidence	Is the expanded uncertainty a relative one?	Standard									Source of traceability	Intra-APMP Reviewer's 1st Comments	NMI's reply to the Reviewer's 1st comments
DC voltage sources: single values	Solid state voltage standard, standard cell	Compare against reference standard	1	10	V	Temperature	23 °C	0.03 to 0.9	µV/V	2	95%	Yes	Josephson junction voltage standard, Solid state voltage standard	NIMT	BIPM.EM-K11	Approved on 10 November 2014	1.1.1	1.1.1	NIMT	Mx1.1.1				
DC voltage sources: low values	DC voltage source, multifunction calibrator	Compare against DC standard	0	10	V			0.5 to 7	µV	2	95%	No	DC standard	PTB		Approved on 10 November 2014	1.1.2	1.1.2	NIMT	Mx1.1.2				
DC voltage sources: intermediate values	DC voltage source, multifunction calibrator	Compare against DC standard	> 10	1000	V			20 to 1000	µV	2	95%	No	DC standard	PTB		Approved on 10 November 2014	1.1.3	1.1.3	NIMT	Mx1.1.3				
DC resistance sources: low values	Fixed resistor	DCC bridge and range extender	0.001	1	Ω	Test current Oil bath temperature	0.1 A to 100 A 23 °C	0.17 to 12	µΩ/Ω	2	95%	Yes	Standard resistor	BIPM	BIPM.EM-K13.a and 13.b	Approved on December 2016		2.1.1	NIMT	Mx2.1		OK, N-H Kaneko	Peer review and intra-RMO review done simultaneously in Dec. 2016 and subsequent corrective action	
DC resistance sources: intermediate values	Fixed resistor	DCC bridge, QHR, Automatic high Resistance Ratio Bridge	> 1E-6	1	MΩ	Voltage	1 V to 100 V	0.14 to 1.3	µΩ/Ω	2	95%	Yes	Standard resistor	BIPM				2.1.2	NIMT	Mx2.1		OK, N-H Kaneko	Peer review and intra-RMO review done simultaneously in Dec. 2016 and subsequent corrective action	
DC resistance sources: high values	Fixed resistor	Automatic high Resistance Ratio Bridge, Dual Source high Resistance Ratio Bridge	> 1E-6	100	TΩ	Test voltage	1 V to 1000 V	1.8 to 24400	µΩ/Ω	2	95%	Yes	Standard resistor	BIPM	APMP.EM-K2			2.1.3	NIMT	Mx2.1		OK, N-H Kaneko	Peer review and intra-RMO review done simultaneously in Dec. 2016 and subsequent corrective action	
DC current sources: low values	Current generator, multifunction calibrator	V/A method	10	100	µA			7.5 to 8.5	µA/A	2	95%	Yes	Current shunt	PTB		Approved on 10 November 2014	3.1.1	3.1.1	NIMT	Mx3.1.1				

- Other MRA-related Initiatives:
 - Use of on-site peer for the review of quality systems
 - Commercial calibrations as an alternative to comparisons.

OK, N-H Kaneko	Peer review and intra-RMO review done simultaneously in Dec. 2016 and subsequent corrective action	
OK, N-H Kaneko	Peer review and intra-RMO review done simultaneously in Dec. 2016 and subsequent corrective action	
OK, N-H Kaneko	Peer review and intra-RMO review done simultaneously in Dec. 2016 and subsequent corrective action	



33rd APMP GA 2017



Delhi, India
24 November – 1 December 2017





Thank You

Ilya.Budovsky@measurement.gov.au

Progress of APMP Focus Groups

Energy Efficiency

- Begun by focusing on particular issue in a particular economy:
 - Engage with high energy consuming industries, **raise awareness**, knowledge and skills of engineers to improve accuracy of temperature measurement
 - **Provide consultancy and support** (training) to industry in temperature measurement to improve energy consumption
 - **Establish measurement traceability** to measuring instruments used in industry, provide calibrations
- Gather information to evaluate & compare results
- Broaden to measuring techniques and instruments that can contribute to energy efficiency
- Disseminate above approach to APMP FG members
- Discuss expansion of approach to other issues and economies
- Energy Efficiency Workshop to be held in conjunction with the APMP GA 2016



Progress of APMP Focus Groups

Food Safety

- May 2015: Survey of capabilities, activities, and issues in APMP member economies.
- November 2015: Workshop to review survey results and develop action plans.
- November 2016: Food Safety Workshop held in conjunction with the APMP GA.



Progress of APMP Focus Groups

Medical Metrology

- Survey of capabilities, activities, and issues in APMP member economies begun, in progress;
- November 2015 Workshop to review survey results to-date, name of FG revised from “Medical Diagnostic Equipment” to “Medical Metrology”, scope defined as follows:
 - Support the whole value chain (from R&D design, to manufacturers and to end users)
 - Traceability of medical devices and diagnostics
 - Setup international equivalence on medical measurements
 - Share mutual experience among NMIs, Designated Institutes (DIs) and TCs
- Practical next steps under discussion, including comparisons and new standards



Progress of APMP Focus Groups

Climate Change

- **Draft Scope:** Metrology for the climate change in view of direct factors (calibration of instruments & sensors related to stack emission and background measurement)
- **Draft Objectives:**
 - To establish national measurement standards related to the climate change (Flow, Temperature, Sensors, spectroscopy, Gases, Aerosol)
 - To exchange information on how an NMI can support the national climate change body (Measurable, Reportable, Verification)
 - To give strategic advice to NMIs on climate change programs
- Undertaking survey to understand national needs and capabilities and the status of activities in NMIs



Stakeholder Interactions

- APMP-APLAC Cooperation (Joint PT WG), meeting on 1 November 2015:
 - PT programs for 2015/16 (food safety)
 - Elements in food supplements
 - Organochlorine pesticides in ginseng root
 - Determination of iron and zinc in wheat flour
 - Cadmium in milk powder
- APMP's linkages with Asia Pacific Economic Cooperation (APEC)
 - APEC-funded "Food Safety Workshop", Nov 2016, Da Nang, Vietnam
 - February 2016 meetings of APEC Sub-Committee on Standards and Conformance (SCSC) and Specialist Regional Bodies (SRBs)* Forum
 - Participation in August 2016 SCSC Conference on Standards and Conformance
 - APEC-funded Food Safety Workshop being planned with annual APMP 2016 meetings in November in Vietnam
 - APMP continues to represent SRBs in APEC's Food Safety Cooperation Forum's Partnership Training Institute Network (FSCF PTIN)

**APEC SRBs: APLAC, APLMF, APMP, PAC, and PASC*



Support for Developing Economies

APMP Mid-Year Meetings, Malaysia, 22-26 May 2017:

- Always held in developing member economy
- Strategic and governance meetings of APMP's Executive Committee, Technical Committee Chairs and Developing Economies Committee (DEC)
- Awareness-raising seminar
- Technical Workshops
- DEC-MEDEA* Workshops
- **MEDEA: Metrology: Enabling Developing Economies within Asia – 4-year joint (APMP & APLMF) capacity building project of Physikalisch-Technische Bundesanstalt (PTB), Germany*

KRISS Global Metrology Academy: <http://gma.kriss.re.kr/jsp/program.jsp>

