Asia-Pacific
Economic Cooperation

2014/SCSC/WKSP2/013
Session: 7.1

Role of Proficiency Testing on Lab Capacity Building: APLAC Proficiency Testing Activities

Submitted by: Japan

APEC
CHINA 2014

Food Safety Cooperation Forum Partnership Training Institute Network Proficiency Testing Workshop
Beijing, China
10-11 September 2014

Role of Proficiency Testing on Lab Capacity building -APLAC PT activities-

APEC FSCF PTIN Proficiency Testing Workshop
10-11 SEP 2014
Beijing China

APLAC PT Committee Chair
Koichi NARA (IAJapan/NITE, AIST)
aplacptc@gmail.com

APLAC
Asia Pacific Laboratory Accreditation Cooperation

Self Introduction of K. Nara

- APLAC (Asia Pacific Laboratory Accreditation Cooperation) Proficiency Testing Committee Chair (2011 -2016, possibly), supported by IAJapan/NITE
- Working for AIST (National Institute of Advanced Industrial Science and Technology)
  - Promoting Standardization Activities in AIST
  - Quality manager of Proficiency Testing Activities of AIST
- Work Experience
  - Worked for NMIJ, AIST Metrologist in thermometry etc.
  - Quality manager of NMIJ
  - CEO of IAJapan/NITE, accreditation body in Japan

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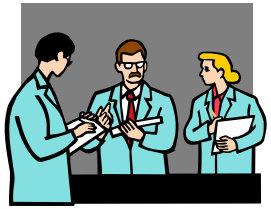
Stakeholders and their Roles

International : ILAC

Regional CB : EA, IAAC, APLAC

PT Committee

Regulator



Experts

designate/register

Accreditation

Accreditation Body

PT Provider

Standardization Body
Criteria, Test Method

Accreditation

Laboratory

Market

Main Topics to be covered

- ABs provide the third party attestation of the competence of
  - Laboratories
  - Proficiency Testing Providers
- Role of ILAC/APLAC
  - MRA
- APLAC Proficiency Testing Committee
- PT activities
  - Planning : 'Fit for the purpose'
  - Operation : Sharing the experiences
  - Following up activities : Training of Laboratories

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Summary

1. Introduction of APLAC (in brief)
   - APLAC MRA extension to PT Provider
2. Stakeholders of the regulation
3. Activities of APLAC PT Committee
4. Use of Proficiency Testing
   - Objective evidence for the competence of the laboratory
   - Tool for the Capacity building
5. Mechanisms for the Capacity building to be developed

Attached Documents

- MasterList of Studies13AUG2014
- CalenderofAPLACPT19AUG2014

For your reference

- IntroductionofAPLACPTCforAPEC2014SEP10
- Introduction of APLAC 'aplac_pr_007_issue_36'

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What is APLAC

- APLAC stands for 'Asia Pacific Laboratory Accreditation Cooperation'
- Memberships
  - ABs in all APEC economies except Chile
  - Also Bangladesh, Bhutan, Gulf Region, India, Mongolia, Pakistan, Sri Lanka
  - 40 full members, 11 associate members
- Established 1992
- APLAC is a recognised Regional Cooperation Body Member of ILAC
- ❖ Introduction of APLAC 'aplac_pr_007_issue_36'

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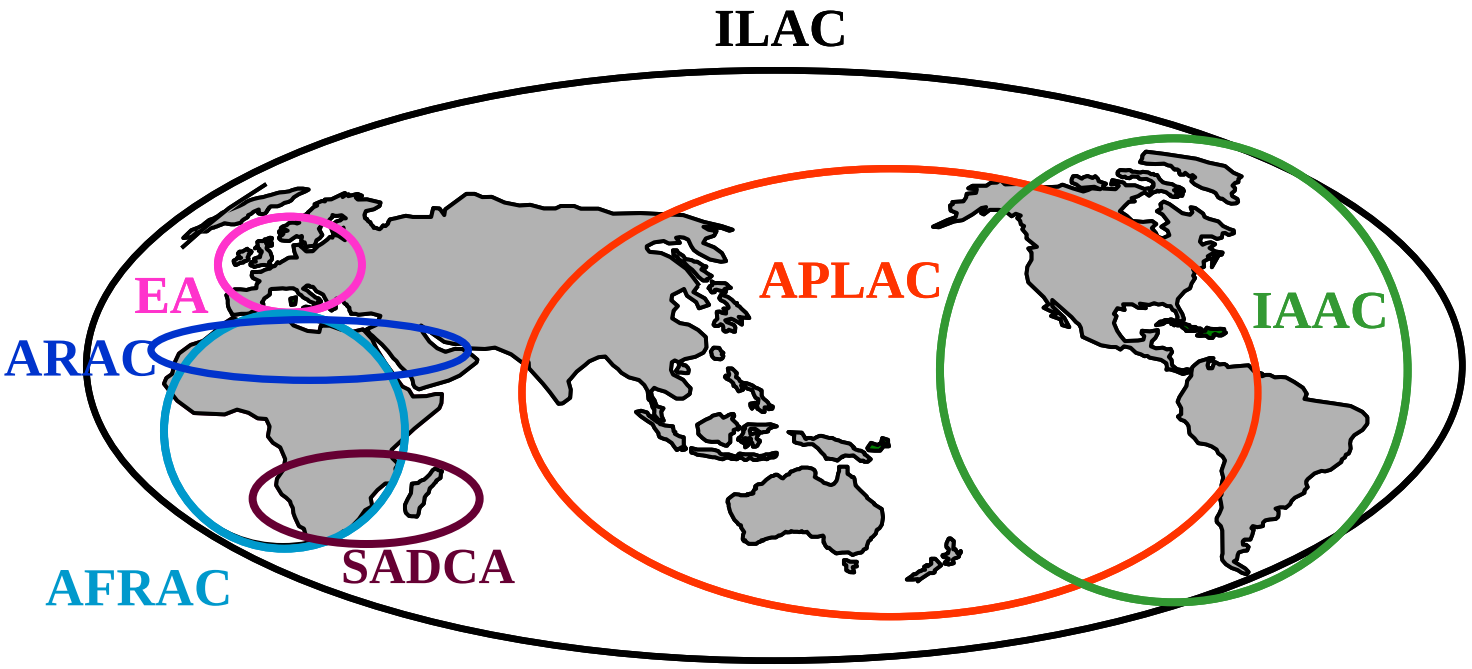
The International View



EA	European Cooperation for Accreditation
APLAC	Asia Pacific Laboratory Accreditation Cooperation
ILAC	International Laboratory Accreditation Cooperation
IAAC	Inter-American Accreditation Cooperation
SADCA	Southern African Development Community Accreditation
AFRAC	African Regional Accreditation Cooperation
ARAC	Arab Accreditation Cooperation
Unaffiliated Bodies	Peer evaluated ABs who are not geographically located in one of the established regions

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APLAC-Primary Objective

- Extending MRA to (testing and calibration) laboratories, inspection bodies, Reference material producers and **Proficiency testing providers**
- Acceptance of test, calibration and inspection reports and reference material certificates amongst all signatories' economies
  - demands mutual confidence in technical competence
- **APLAC MRA reduces or eliminates need for re-testing or re-inspection of imported goods**
  - **(one-stop testing)**

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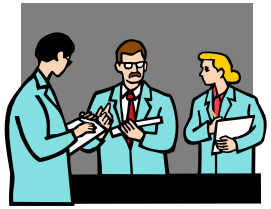
Stakeholders and their Roles

International : ILAC

Regional CB : EA, IAAC, APLAC

PT Committee

Regulator



Experts

Accreditation Body

Accreditation

designate/register

Standardization Body
Criteria, Test Method

PT Provider

Accreditation

Laboratory

Market

Impact of APLAC MRA extension to Proficiency Testing provider

- Anyone (Laboratory, Regulator, Capacity Builder) can easily identify competent PT providers.
- Accreditation on PTPs will be harmonized and accredited PTPs will be recognized regionally/internationally.
- More PT programs will be available. More initial accreditation will be firmly based on the proficiency testing program.

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Laboratories for the regulation

Exporting Economy

Importing Economy

Regulator

designate/register

Laboratory in Economy A

Laboratory in Economy B

Market

ILAC/APLAC MRA

AB in economy A

AB in economy B

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Testing results need to be Reliable

- Regulation is based on the comparison of the testing results with the criteria,
  - Positive bias on the side of laboratory may lead to Economical loss. (OK items are discarded.)
  - Negative bias on the side of laboratory may lead to health/safety/environmental risk. (NG items enter the market.)

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Core items to realize the Reliability

- Reliable standards for testing
  - Testing Method
  - Criteria (Codex, ISO, IEC, etc.)
- Competence of laboratory
  - General requirements
    - ISO/IEC 17025
    - GLP
- Others additional requirements
  - Domestic
  - International (TBT SPS may apply)

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How can the laboratory claim its competence?

- Accreditation is one of the tools.
  - Some regulators recognize Accreditation (or ILAC/APLAC MRA) with/without extra requirements.
  - In that case, PT participation is guaranteed due to the following reason.
- ISO/IEC 17025, 5.9.1 : Requirements for Quality control procedures gives several options such as
  - Method Validation
  - Internal Quality Control
  - External Quality Assessment
    - Interlaboratory Comparison or **Proficiency Testing Program**
      - **A successful participation in PT is required to gain accreditation.**
      - **Requirement in ILAC P9 4.2**

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Possible Recognition of the Results by Regulators (across the border)

- Acceptance of Pass/Fail Result
  - May be subject to the difference in the regulatory schemes
- Recognition of Testing Data
  - Requirements for the laboratories
    - Direct assessment by the regulator
    - Use of the (domestic) laboratory accreditation?
    - Use of the ILAC/APLAC MRA?
      (without any extra requirements?)
    - GLP (Good Laboratory Practice)

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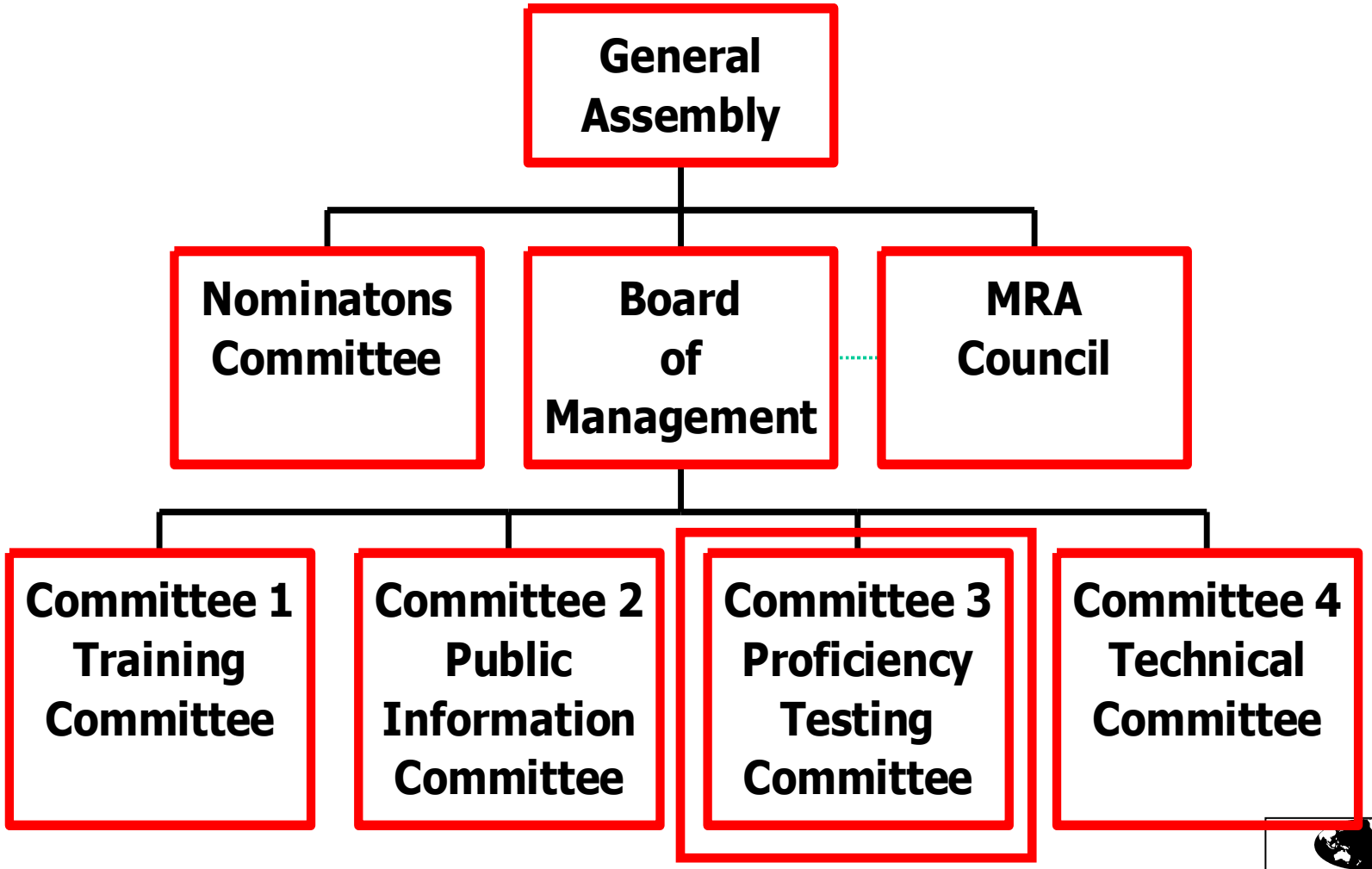
APLAC's Structure and PT Committee



- IntroductionofAPLACPTCforAPEC2014SEP10

TORs of APLAC PT Committee At a Glance

Operation of APLAC PT Programs

Planning

Survey the members needs for PT

Review and Approval of PT Proposals for APLAC PT Programs

Operation, Reporting

review the final report of each program, prior to release

cooperate with ILAC RCBs and unaffiliated bodies

Document PT Procedures

Use of APLAC PT Results

provide PT participation and performance summaries to evaluation team leaders

provide APLAC members with PT activity updates

provide APLAC members with training, guidance documents

Other TORs (Including Chair's work)

Represent the APLAC PT Committee at the ILAC PTCG

Cooperate with other organizations for PT related activities.

Respond to requests from MRA council on issues regarding the MRA

Operations of APLAC Proficiency Testing Activities

- Each year, several programs are proposed by the member accreditation bodies
- Each Organizing (Accreditation) body is funded by APLAC for $10 000 for each program
- The Participation to the APLAC PT program is made through the nomination by the Accreditation Body up to 4 labs each
- The participation fee is free
- In case of the testing fields, the invitation is sent to other ILAC regional cooperation bodies and unaffiliated bodies
- The Full list of the APLAC PT program are found at the APLAC web site

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List of Recent PT (Testing) programs

T079 Phthalates in Plastic	TAF	December-10	November-11	Completed
T080 determination of active pharmaceutical ingredients in pharmaceutical preparation	CNAS	July-11	July-12	Completed
T081 PT Programme for Pesticides in Green Tea	HKAS	August-11	October-13	Completed
T082 Essential and Toxic Elements in Seafood	HKAS	July-11	August-13	Completed
T083 Preservatives in Soy Sauce modifications	TAF	August-11	July-12	Completed
T084 Organochlorine pesticide residues in chicken fat	DMSc	July-12	**Mid2014**	Underway
T085 BOD, COD, NO2- NO3 and NH3 in Wastewater	SCC	November-12		Underway
T086 Metals in three areas of analysis - Environmental- Food- Biological	SCC	November-12		Underway
T087 Cause and Manner of Death	CNAS	January-13	**Mid2014**	Underway
T088 lighting testing	CNAS	February-13	**Mid2014**	Underway
T089 Determination As, Cu, Pb and Cd in laver	CNAS	March-13		Underway
T090 coal	CNAS	December-13	**Late 2014**	Underway
T091 Lemigas_Lubricant	KAN	December-13	**Late 2014**	Approved
T092 Trace Elements in Drinking Water	KOLAS	June-14	Late 2014	Underway
T093 Determination of toxic elements (Lead and Cadmium) in Cabbage	APMP-APLAC	July-14	Early 2015	Underway
T094 Determination of pesticide residues (p,p'-DDE and alpha-endosulfan) in Cabbage	APMP-APLAC	July-14	Early 2015	Underway
T095 Determination of elements (e.g. Calcium and Cadmium) in drinking water	APMP-APLAC			Approved
T096 printed document examination	CNAS			Approved
T097food microbiology	CNAS			Approved

The comprehensive list is found in ‘MasterList of Studies13AUG2014’

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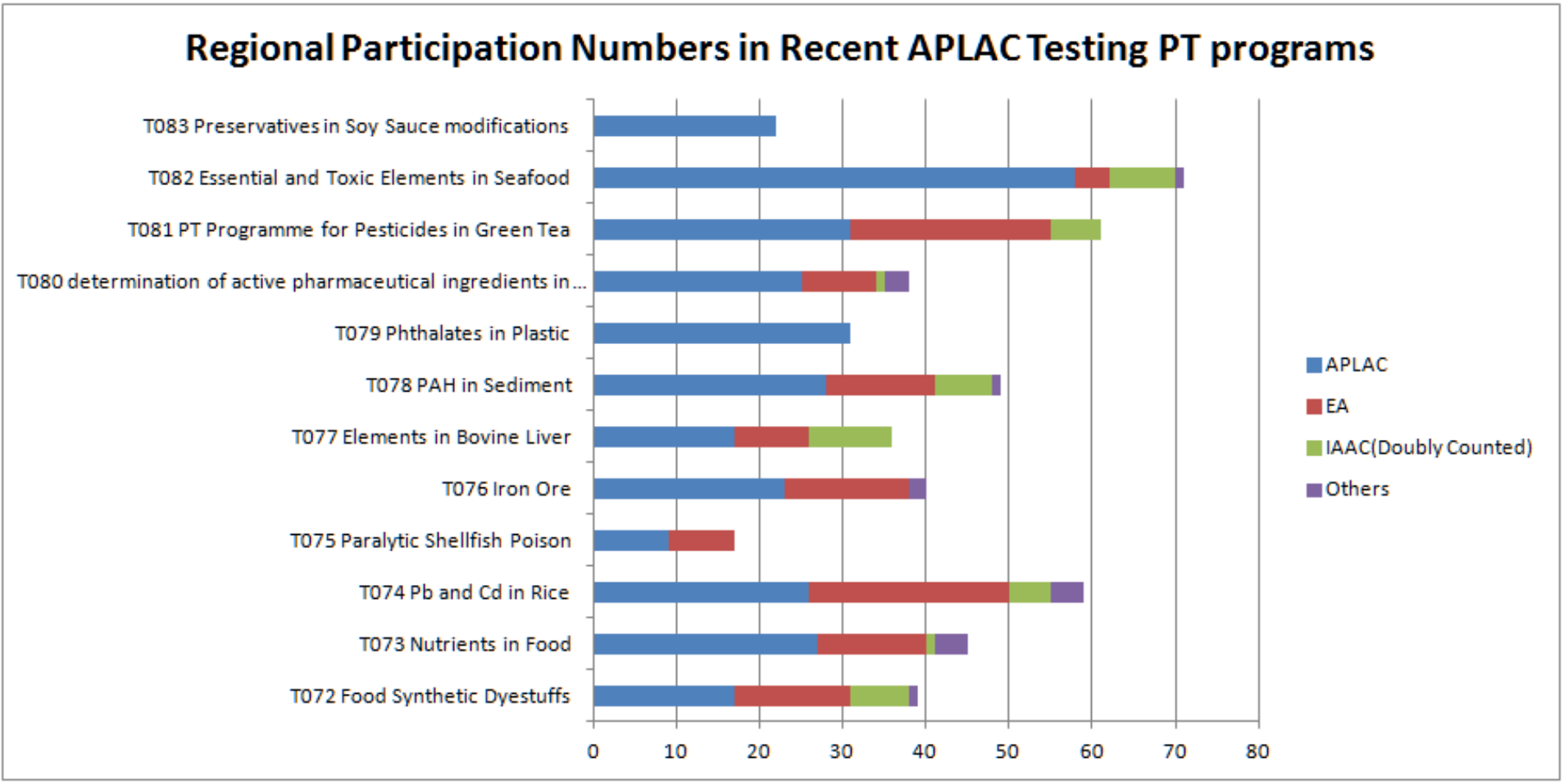
Participation Numbers from RCBs



PT plan is shared by the ‘Calendar’

legend	
Nomination from Abs	N
Dispatch of the artefacts	D
Deadline of the submission of the results	R
Interim report	I
Final report	F

PT ID	name	Note	Y	2013											2014												2015												2016	
			M	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2
M011	Thermocouple																																							
M021	Volume																																							
M022	Gauge Block																																							
M026	Calibration of Square														N	N	N	D	D	D	D	D	D	D	D	D	D	D	D	I	I	F	F								
M027	E2_Weight																N	N	N	N	N	D									R	R	I	F	F	F					
T084	Organochlorine pesticide residues in chicken fat	Nomination from A		D			I	F																																
T085	BOD, COD, NO2- NO3 and NH3 in Wastewater						N	N	N						D		I	F																						
T086	Metals in three areas of analysis - Environmental- Food- Boilogical						N	N	N			D	R	I	F																									
T087	Cause and Manner of Death								N	D		R		F																										
T088	Photometric measurement of Solid State Lighting Products				N	N	N	N	D	D	D	D	D	I	F																									
T089	Determination As, Cu, Pb and Cd in laver																						N	D	R				F											
T090	coal														N	N	N	D	R		F																			
T091	Lemigas_Lubricant																N	N	N		D	R		F																
T092	Trace Elements in Drinking Water																				N	D	R		F															
T093	Determination of toxic elements (Lead and Cadmium) in Cabbage	APLAC-APMP JOinted PT																			N	D		R		I		F											
T094	Determination of pesticide residues (p,p'-DDE and alpha-endosulfan) in Cabbage	APLAC-APMP JOinted PT																			N	D		R		I		F											
T095	Determination of elements (e.g. Calcium and Cadmium) in drinking water	APLAC-APMP JOinted PT																					N	D				R		I					F				
T096	printed document examination																																							
T097	food microbiology																						N	D	R				F										
IMEP37	Determination of pesticides in grapes							N	N	N	N		D		R																									
IMEP38	Determination of total As, Cd, Pb and Hg in compound feed							N	D	R																														
IMEP39	Hg in compound feed						N	D	R																															
IMEP-118	Interlaboratory comparison exercise for the determination of total As, Cd, Pb, Hg, Sn and iAs in canned food																	N	D		R			F															
IMEP-119	Interlaboratory comparison exercise for the determination of total As, Cd, Pb and Hg in vegetable feed																		N	D	R			F															
IMEP-40	Interlaboratory comparison for the determination of trace elements in seawater																						N	D	R														
APEC	Veterinary Drug Multi-residues in Chicken								N			D		R																									

➢ CalenderofAPLACPT19AUG2014 is provided

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PT Activities in Depth

- Comparative study between APLAC PTs and APEC FSCF activities
  - Planning : 'Fit for the purpose'
  - Operation : Sharing the experiences
  - Following up activities : Training of Laboratories
- Are there are differences in the approaches between ABs and Capacity builders?

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Needs Driven Approach to APLAC PT Planning

- Questionnaire was distributed to the APLAC Committee members to identify
  - The objects of APLAC PT programs
  - The needs of PT Program in specific areas(Needs)
  - The possible provision of PT by ABs(Seeds)
- They have been compared with the records of APLAC PT programs.(Crops)
- Now the matching between seeds and needs is sought within the APLAC PT Committee.

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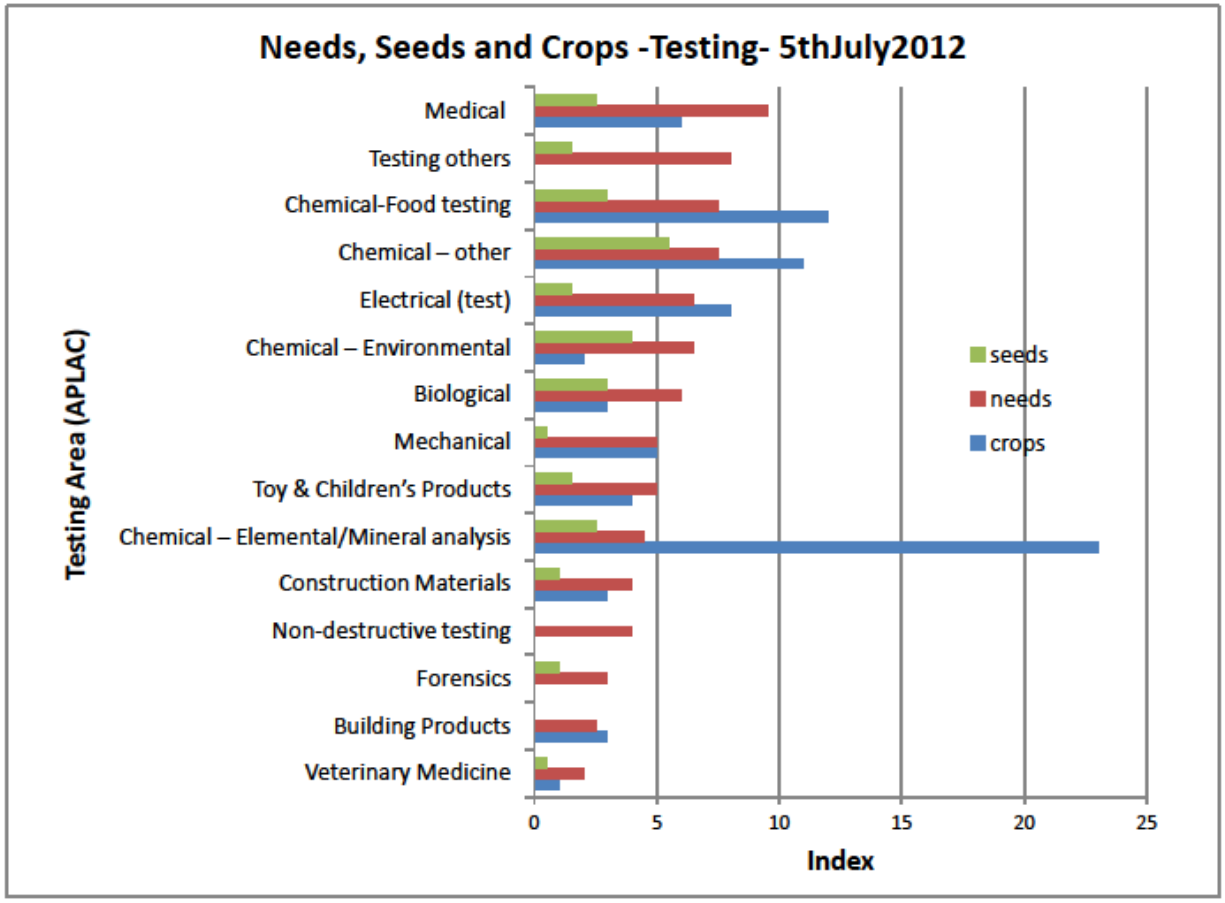
Testing



1. Medical PT is highly needed.
2. Chemical-environmental has a few crops. It is an important area from the view point of the regulators.
3. Forensic has no crop at all. As it is within the scope of APLAC MRA, APLAC PT is worth organized even if the number of participants may be limited.
4. Food testing is an important field. We cannot do without the PT in this field.

T036 Food Veterinary Drug Residues CNAL 2003-2004
T048 Beef Veterinary Drug Residues CNAL 2005

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A policy for prioritising PTs

- High priority for the PT programs that are identified as targeting **the elimination of risk or positively contributing to the issues of safety (e.g. health related).** These should be inclusive of the PT programs which support the areas of testing addressed by regulators in a number of economies, where applicable.
- High priority for the PT programs identified by a number of APLAC members as **strongly needed**, where their contribution to facilitation of trade in the region has been recognised.

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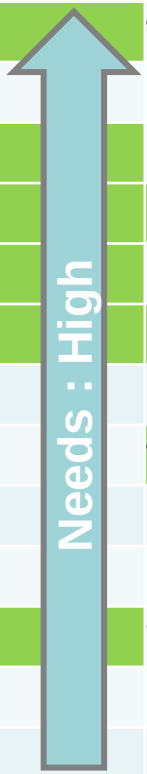
WG1 Needs Driven Approach : Updates of Survey on Needs for PTs (5th DEC 2013)

Needs	Testing	Calibration
4.5	Safety parameters of household appliances	
4	Food testing (microbiology)	Hardness testing machines/Hardness blocks
		Micropipette
3.5	Flammability tests for toys	Torque sensor
		Hygrometer
3	Bottled drinking water	Sound level meter/Sound level calibrator
	Mercury concentration in toys	Gauge blocks
	Safety test (toys)	Load cell
	Acoustic test (toys)	E2 OIML class weight
	Feeding stuffs	Standard weights
		Thermocouples
2.5	Preservatives	Digital multimeters
	Pesticides	Standard resistors
	Residue of veterinary drugs in food	Vacuum gauge
	DNA sequencing	
	Plant health (virology)	
	Energy efficiency of appliances	
	Concrete	
	Heavy metals in toys	



Highlighted in green are those programs where there is a balance of a strong need and a strong possibility for PT provision by APLAC member economies.

Possible differences in the policy of Planning PTs

- ABs need good coverage by PTs over the wide scopes of the testing fields.
  - Needs (matrix × analytes × methods) cannot be fully covered by the existing PT programs.
  - Commutabilities of the PTs are always AB's concerns.
  - ABs wish to have PTs filling the gap between needs and supplies.
- Laboratories (or even regulators) may wish to have repeated PTs in the same fields to see the improvements.
- There are differences in the planning policy between ABs and Capacity builders.

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Experiences in Operation may be shared

- Selection of Assigned values
  - (traceable)reference value
  - or consensus value
- Selection of SDPA
  - fit for the purpose
  - Regulatory requirements may vary between Economies
  - Robust standard deviation
  - etc.
- Uncertainty Report
  - Uncertainty estimation in the field of testing has not been established well.
- Border Issues
  - the PT items got stuck at the Customs
  - Chicken FAT could not get across the border
  - Ionizing radiation was applied to PT items and causing instability of the analytes

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Use of PT results
-by Accreditation Body-

- Taken as an objective evidence of the technical competence of the laboratory, if successful.
- If a laboratory failed, corrective action taken by the laboratory is assessed by AB.
  - AB cannot make a direct advice on how to improve. It is prohibited by ISO/IEC 17011.
  - **Is the monitor of the corrective action effective/efficient enough for improvements?**

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Use of PT Results
-By laboratories-

- Bias is informed with the performance (satisfactory/unsatisfactory).
- No direct advice on the possible error sources is not usually provided by the PT reports.
  - Typical error sources
  - Uncertainty Estimation
- **They may need specific guides.**

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APLAC-APMP Joint PT Activities

APLAC PT Committee WG6

APMP

APMP-APLAC Joint PT Working Group

Advice on Joint PTs

Nominated DIs

Nominating ABs

APLAC PT Committee

(Approval, APLAC Funding)

TORs of APMP-APLAC Joint PT WG

A) develop and prioritize the schedule of joint PT programmes
B) develop the overall design and conduct of joint PT programmes
C) recommend to APLAC PT Committee for approving suitable NMI(s) or DI(s) to coordinate joint PT programmes with reference values
D) nominate potential NMI/DI for participation
E) recommend mode of assignment of reference values.

Planning

F) review the draft final report and make recommendations to APLAC PT Committee
G) review any problems which may have arisen in joint PT programmes
H) the working group will receive a copy of the performance reports for the nominated APMP institutes for necessary follow up actions

Reporting

I) identify technical development, **training needs and recommend follow-up actions** to appropriate committees of APLAC and APMP

Corrective Actions

The APLAC-APMP Joint PTs will be planned on long term basis

- The matrix is and will be systematically chosen to help the laboratory/AB to identify the error sources.
- A Joint PT will start with a simple matrix.
  - heavy element in water
- After some PTs, the matrix will be a one in a real world.
  - pesticide residues in rice
- The corrective action could be made systematically and efficiently.

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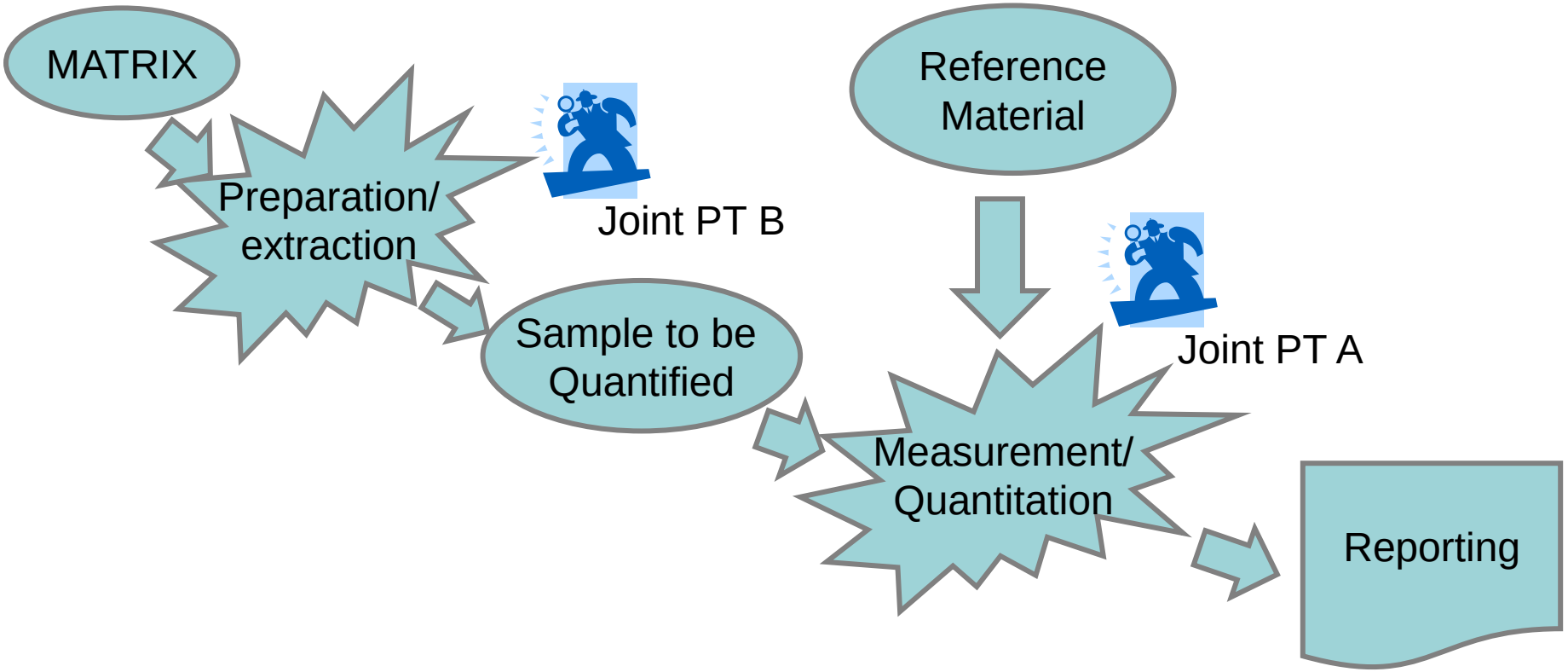
A Chemical Analysis model
-Focus of the APMP/APLAC Joint PT -



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Possible following up activities for APMP-APLAC Joint PTs

- Analysis of the possible error causes may be provided in the PT report
  - An international workshop on the PTs may be organized
    - Then holding a workshop in each economy.
  - Any possible and/or cost effective way of sharing the knowledge?
  - Possible topics to be discussed at the APMP/APLAC Joint PT Working Group

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APEC FSCF-APLAC
Possible Cooperative Activities?

- Planning, Operation(Sharing the experience), Following up
- Some Common Stakeholders
  - Experts developing document standards (eg. Codex)
  - Experts used as the technical assessor (Technical expert) by accreditation body
  - Experts (technical advisory board) giving an advice to plan the PT program
- PT schemes addressing the capacity building
  - matrix, analyte
  - repetitive scheme for a few years
  - preferably, reliable assigned values
- Funding
  - First development
  - Repetition

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Thank you for your attention!

- Contact:
  - Koichi NARA, APLAC PT Committee Chair
  - IAJapan/NITE, (Contact Organization, AIST)
  - aplacptc@gmail.com
- APLAC Contact
  - website: http://www.aplac.org
  - email: aplac@nata.com.au

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legend

Nomination from Abs	N
Dispatch of the artefacts	D
Deadline of the submission of the results	R
Interim report	I
Final report	F

PT ID	name	Note	Y	2013												2014																2015												2016	
			M	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2		
M011	Thermocouple																																										
M021	Volume																																										
M022	Gauge Block																																										
M026	Calibration of Square														N	N	N	D	D	D	D	D	D	D	D	D	D	D	D	I	I	F	F										
M027	E2_Weight																N	N	N	N	N	D												R	R	I	F	F	F				
T084	Organochlorine pesticide residues in chicken fat	Nomination from Ab		D			I	F																																		
T085	BOD, COD, NO2- NO3 and NH3 in Wastewater						N	N	N						D		I	F																								
T086	Metals in three areas of analysis - Environmental- Food- Boilogical						N	N	N			D	R	I	F																										
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T088	Photometric measurement of Solid State Lighting Products				N	N	N	N	D	D	D	D	D	I	F																											
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T091	Lemigas_Lubricant																N	N	N		D	R		F																		
T092	Trace Elements in Drinking Water																				N	D	R		F																	
T093	Determination of toxic elements (Lead and Cadmium) in Cabbage	APLAC-APMP JOinted PT																			N	D		R		I			F												
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T095	Determination of elements (e.g. Calcium and Cadmium) in drinking water	APLAC-APMP JOinted PT																					N	D				R			I							F			
T096	printed document examination																																									
T097	food microbiology																							N	D	R			F												

IMEP37	Determination of pesticides in grapes							N	N	N	N		D		R																											
IMEP38	Determination of total As, Cd, Pb and Hg in compound feed							N	D	R																																
IMEP39	Hg in compound feed						N	D	R																																	
IMEP-118	Interlaboratory comparison exercise for the determination of total As, Cd, Pb, Hg, Sn and iAs in canned food																N	D		R			F																		
IMEP-119	Interlaboratory comparison exercise for the determination of total As, Cd, Pb and Hg in vegetable feed																	N	D	R			F																		
IMEP-40	Interlaboratory comparison for the determination of trace elements in seawater																						N	D	R																
APEC	Veterinary Drug Multi-residues in Chicken								N			D		R																												

Program	Coordinator	Starting Date	(Tentative) Final Report Distribution Date	Status
M000 Calibration PT				
M001 Dimensional Metrology	NATA	May-94	October-96	Completed
M002 Mass	NATA	November-94	November-96	Completed
M003 Resistance	TAF	November-94	December-00	Completed
M004 AC/DC Voltage	HKAS	January-95	December-98	Completed
M005 Thermometer	SAC	May-96	October-98	Completed
M006 Pressure	NATA	July-96	January-99	Completed
M007 Force	NATA	October-99	November-04	Completed
M009 RF Power	NATA	May-01	September-05	Completed
M010 Sound Level Meter	NATA	March-01	March-07	Completed
M011 Thermocouples	SAC	October-08	January 10	Completed
M015 Resistance	JAB	August-04	June-08	Completed
M016 Watt-Hour	IANZ	August-04	September-08	Completed
M017 Mass (North loop)	HKAS	July-05	June-08	Completed
M017 Mass (South loop)	KAN	July-05	January-07	Completed
M018 Short Gauge Blocks	IAJapan	June-05	December-07	Completed
M019 Pressure	KOLAS	February-07	October-08	Completed
M020 DC Current Measurement	SM	February-07	May-09	Completed
M021 Volume	KAN	May-07	**Mid2014**	Underway
M022 Gauge Blocks	NSC-ONSC	November-2010	June-14	Completed
M023 Relative Humidity Measurement	Standards Malaysia	August-07	February-10	Completed
M024 Plain Plug Gauges	KOLAS	November-09	October-11	Completed
M025 Hydraulic Pressure	Standards Malaysia	Mid 2009	November-12	Completed
M026 square calibration	KOLAS	November-13	**Early 2015**	Underway
M027 E2_Weight	KAN	November-13	**Late 2015**	Underway
T000 Testing PT				
T001 Metals in Water	NATA	April-96	October-96	Completed
T002 Tensile	NATA	October-96	March-97	Completed
T003 Dust in Air	TAF	November-96	August-99	Completed
T004 Food Additives	HKAS	November-96	July-97	Completed
T005 Aluminium Alloys	NATA	February-97	July-97	Completed
T007 Milk Powder	IANZ	June-97	December-97	Completed
T008 Textiles	NATA	July-97	November-97	Completed
T009 Fish	NATA	December-97	July-98	Completed
T010 Electrical Safety	NATA	February-98	August-98	Completed
T011 Concrete	NATA	June-99	January-00	Completed
T012 Plastics	A2LA	May-98	July-99	Completed
T013 Toy Safety	HKAS	August-98	July-99	Completed
T014 Pharmaceutical	SAC	September-98	April-99	Completed
T015 Tensile	NABL	October-99	July-00	Completed
T016 Toy Safety	HKAS	November-99	June-00	Completed
T017 SAR	TAF	September-04	December-05	Completed
T018 ADSL Terminal Equipment	TAF	April-04	March-05	Completed
T019 Telephone Set	TAF	April-04	March-05	Completed
T020 Portland Cement	TAF	May-05	February-06	Completed
T021 Alcoholic Beverage	TAF	May-05	February-06	Completed
T022 Toy Safety	HKAS	June-00	August-02	Completed
T023 Electrical Safety	NATA	March-00	January-01	Completed
T024 Coal	NATA	October-00	February-01	Completed
T025 Flour	SAC	December-00	December-01	Completed
T026 Low Alloy Steel	JAB	February-01	October-01	Completed
T027 Rockwell Hardness	IAJapan	December-01	December-02	Completed
T028 Egg Powder	NABL	August-01	March-03	Completed
T029 Food	NATA	July-01	November-01	Completed
T030 Food Microbiological	CNAL	June-02	January-03	Completed
T031 Cement	IAJapan	January-02	August-10	Completed
T032 Dairy	NATA	June-02	October-02	Completed
T033 Geochemical	KOLAS	April-02	January-04	Completed
T034 Genetically Modified Organism	CNAL	September-03	May-04	Completed
T035 Food Additives	CNAL	May-03	August-04	Completed
T036 Food Veterinary Drug Residues	CNAL	March-03	November-04	Completed
T037 Rice Flour	NATA	May-03	November-03	Completed
T038 Pharmaceutical	HKAS	July-03	August-04	Completed
T039 Toy Safety	HKAS	December-03	March-06	Completed
T040 Coal	BoA	March-04	January-05	Completed
T041 Coliforms	NATA	May-04	October-04	Completed
T042 Paper	A2LA(CTS)	March-04	January-05	Completed
T043 Herbal Medicine	HKAS	June-05	January-06	Completed
T044 Textiles	HKAS	May-05	November-05	Completed
T045 Fastener	TAF	June-05	February-06	Completed
T046 Food Microbiological	CNAS	May-07	December-08	Completed
T047 Animal Materials in Feedstuff	CNAL	June-05	July-06	Completed
T048 Beef Veterinary Drug Residues	CNAL	June-05	November-05	Completed
T049 Organochlorine Pesticide Residues in Herbal Medicine	HKAS	February-06	June-06	Completed

T050 Prawn Nitrofuran Metabolites	CNAS	June-07	November-08	Completed
T051 Heavy Metal Elements in Plastic	TAF	July-06	June-07	Completed
T052 Tensile Test for Metallic Materials	TAF	May-07	March-08	Completed
T053 Thermal Insulation	IAJapan	April-06	December-10	Completed
T054 Bluetooth	TAF	November-06	May-08	Completed
T055 Metals in Waters	CAEAL	October-06	June-07	Completed
T056 Pesticide Residues in Rice	CNAS	August-07	December-08	Completed
T057 Heavy Metals in Seawater Shrimp	HKAS	November-06	July-07	Completed
T058 Malachite Green in Swamp Eels	HKAS	May-07	February-08	Completed
T059 Pesticide Residues in Ginseng Root	HKAS	December-07	June-08	Completed
T060 Feeding Stuffs	DSS	June-09	January-10	Completed
T061 Electromagnetic Interference	VLAC	August-08	October-12	Completed
T062 BOD, COD, NO_2+NO_3 & NH_3 in Wastewater	SCC	August-08	June-09	Completed
T063 Safety Test for Creepage and Clearance Distance	TAF	June-08	March-10	Completed
T064 Trace Metals in Water	Standards Malaysia	June-08	March-09	Completed
T065 Cadmium and Lead in Herbal Sample	HKAS	December-07	October-08	Completed
T066 Heavy Metal Elements in Soils	CNAS	October-08	August-09	Completed
T067 Chemical analysis of the components in stainless steel	CNAS	October-08	May-09	Completed
T068 Determination of Polycyclic Aromatic Hydrocarbons	HKAS	October-08	May-09	Completed
T069 Melamine in Fish Feed	HKAS	April-09	August-09	Completed
T070 PBB and PBDE in ABS	TAF	July-09	March-10	Completed
T071 Melamine in Milk Powder	HKAS	July-09	November-09	Completed
T072 Food Synthetic Dyestuffs	CNAS	Mid 2009	August-10	Completed
T073 Nutrients in Food	HKAS	October-09	February-10	Completed
T074 Pb and Cd in Rice	CNAS	October-11	December-11	Completed
T075 Paralytic Shellfish Poison	CNAS	October-11	September-12	Completed
T076 Iron Ore	CNAS	July-2010	July-11	Completed
T077 Elements in Bovine Liver	HKAS	August-10	May-11	Completed
T078 PAH in Sediment	HKAS	July-10	April-11	Completed
T079 Phthalates in Plastic	TAF	December-10	November-11	Completed
T080 determination of active pharmaceutical ingredients in pharmaceutical preparation	CNAS	July-11	July-12	Completed
T081 PT Programme for Pesticides in Green Tea	HKAS	August-11	October-13	Completed
T082 Essential and Toxic Elements in Seafood	HKAS	July-11	August-13	Completed
T083 Preservatives in Soy Sauce modifications	TAF	August-11	July-12	Completed
T084 Organochlorine pesticide residues in chicken fat	DMSc	July-12	**Mid2014**	Underway
T085 BOD, COD, NO2- NO3 and NH3 in Wastewater	SCC	November-12		Underway
T086 Metals in three areas of analysis - Environmental- Food- Biological	SCC	November-12		Underway
T087 Cause and Manner of Death	CNAS	January-13	**Mid2014**	Underway
T088 lighting testing	CNAS	February-13	**Mid2014**	Underway
T089 Determination As, Cu, Pb and Cd in laver	CNAS	March-13		Underway
T090 coal	CNAS	December-13	**Late 2014**	Underway
T091 Lemigas_Lubricant	KAN	December-13	**Late 2014**	Approved
T092 Trace Elements in Drinking Water	KOLAS	June-14	Late 2014	Underway
T093 Determination of toxic elements (Lead and Cadmium) in Cabbage	APMP-APLAC	July-14	Early 2015	Underway
T094 Determination of pesticide residues (p,p'-DDE and alpha-endosulfan) in Cabbage	APMP-APLAC	July-14	Early 2015	Underway
T095 Determination of elements (e.g. Calcium and Cadmium) in drinking water	APMP-APLAC			Approved
T096 printed document examination	CNAS			Approved
T097food microbiology	CNAS			Approved