APLAC

Asia Pacific Laboratory Accreditation Cooperation

TESTING

INTERLABORATORY COMPARISONS

PURPOSE

This document sets out the requirements, policy and procedures for APLAC testing interlaboratory comparisons and stipulates the responsibilities of an accreditation body for the organization of these comparisons and gives guidance on their planning, preparation, execution and preparation of reports.

AUTHORSHIP

This publication has been written by the APLAC Proficiency Testing Committee.

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FURTHER INFORMATION

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1. INTRODUCTION

The purpose of the Asia Pacific Laboratory Accreditation Cooperation (APLAC) is to build up and maintain mutual confidence between national calibration and testing services in order to reach a state of mutual agreement on the equivalence of the operation of the accreditation bodies and of the certificates issued by their accredited laboratories. This supports the removal of technical barriers to trade related to testing activities which underpin all testing and measurement activities.

APLAC testing interlaboratory comparisons provide a forum for the comparability of testing in the Asia-Pacific region. They also provide confidence in the accreditation process of the APLAC members and also in their ability to take the appropriate corrective actions where an interlaboratory comparison reveals testing deficiencies.

APLAC testing interlaboratory comparisons also result in a flow of know-how between the participating accreditation bodies and help establish a common high level of testing performance within the region.

This document provides guidance for the organisation and conduct of APLAC testing interlaboratory comparisons (proficiency testing programs) and lays down the responsibilities for their organisation. It has been prepared by the APLAC Proficiency Testing Committee. Equivalent documents have been prepared for the conduct of APLAC calibration interlaboratory comparisons[(2)] and APLAC Measurement Audits[(3)].

2. ROLE OF THE APLAC PROFICIENCY TESTING COMMITTEE

Overall responsibility for the interlaboratory comparisons lies with the APLAC Proficiency Testing Committee who:-

- after consultation with the APLAC members, select and approve the scheduling of the testing interlaboratory comparisons;
- approve the overall design and conduct of the testing interlaboratory comparisons submitted by the accreditation body;
- maintain a status listing of all testing interlaboratory comparison program (completed, underway, planned)
- approve the accreditation body to organise the testing interlaboratory comparison;
- review the draft final report prior to publication;
- review any problems which may have arisen in an interlaboratory comparison;
- identify technical development, training needs and follow-up action;
- send a copy of the published final report to the APLAC Secretary for posting on the members only area of the APLAC website.

APLAC members are encouraged to take the initiative for proposing to the Proficiency Testing Committee particular testing interlaboratory comparisons. A proposal shall include at least the following information :-

- the sample type to be tested;
- tests to be conducted;
- number and types of laboratories intended as participants
- methods to be followed;

- reporting accuracy and units.

The Committee has the final responsibility for the decision on which testing interlaboratory comparisons will be organised taking into account intercomparisons that will be of most benefit to the majority of APLAC members. The Committee has no financial responsibility for costs associated with the testing interlaboratory comparisons.

3. ROLE OF THE ORGANISING ACCREDITATION BODY

3.1 Tasks

The organising accreditation body that has agreed to coordinate the approved testing interlaboratory comparison has the following tasks:-

- providing suitable samples and packaging;
- appointing a coordinator who coordinates all correspondence;
- appoint a technical adviser (refer section 3.6);
- identifies any collaborators or subcontractors and their roles and responsibilities;
- drafting the instructions to participants;
- inviting the members of APLAC to participate;
- invite the members of EA, APLAC and unaffiliated bodies to participate (where appropriate and feasible);
- assigning confidential code numbers to all participating laboratories;
- minimising problems concerning transportation eg. by supplying a declaration to customs authorities;
- organise homogeneity testing, stability testing and statistical analysis of the results;
- collecting the results of the participants and writing the final reports.

The organising body must comply with the requirements of ISO/IEC Guide 43-1[(4)].

The costs for the organisation of the interlaboratory comparison and transport of the samples to each participating country are covered by the organising accreditation body.

Note that APLAC funding is generally available to assist the organising accreditation body cover the costs associated with the conduct of the testing interlaboratory comparison program. (Refer Appendix H & Appendix I)

3.2 Program design

These programs usually involve the simultaneous distribution of sub-samples of a bulk material for testing by the participating laboratories. A program may also involve the circulation of one or more common samples for testing by participating laboratories.

The program design may involve the distribution of one or multiple samples to each participating laboratory. Each sample may be tested once, or multiple times to suit specified design. Samples may have characteristics that are nominally identical (blind duplicates) or be at slightly different levels (as with split-level design).

The samples used in the testing interlaboratory comparisons should generally be typical of the sample types routinely tested in the participating laboratories.

The samples should be labelled and this identification referenced to the supplied instructions to participants and results sheet.

Sufficient amount of sample should be supplied so that participants may adequately perform the requested tests.

3.3 Homogeneity testing

For testing interlaboratory comparisons the objective of homogeneity testing is to establish a suitably small sample variability, where the samples are sufficiently homogenous.

Initial testing may be conducted during the sample preparation stage, however once the samples have been prepared and packaged, at least 10 samples are selected at random for homogeneity testing. The tests selected are those that are considered to best indicate any significant differences in the samples. All testing is performed at least in duplicate and under repeatability conditions ie. same laboratory; same operator; same method; same equipment; over as short a time interval as possible.

For the samples to be accepted as suitable for use, the results of this testing and any applicable statistical analysis (eg ANOVA) of the results must indicate that no significant variability existed. Thus any outlier results subsequently identified in a program will not be attributable to sample variability.

3.4 Inviting the participants

An invitation detailing the program is to be sent to all participating accreditation bodies. The details will help the participating accreditation bodies decide which of their laboratories can participate. From the responses received the organising body will then organise sufficient number of samples for distribution.

An up-to-date list of APLAC proficiency contacts can be obtained from the APLAC Proficiency Testing Committee Chairman. This listing also details contacts for the European co-operation for Accreditation (EA), Inter America Accreditation Cooperation (IAAC) and ILAC unaffiliated bodies.

3.5 Sample distribution

The following guidelines shall be adhered to where appropriate:-

- samples shall be packaged to avoid damage during transportation.
- the time between dispatch of samples and receipt of laboratories results should be limited to one month;
- the organising accreditation body shall distribute samples to the participating accreditation bodies that are packaged and addressed to their nominated laboratories (refer section 4.1);
- the organising body should include a *customs declaration with each sample dispatch;

*Note: The signed customs declaration should include address details of the sender and receiver, a description and value of the goods, the reason for sending the goods (i.e. interlaboratory testing program) and a statement that the goods are not dangerous or hazardous.

3.6 Instructions and results sheet

The organising accreditation body's coordinator, (collaborator or subcontractor, where applicable) and their technical adviser shall draft the instructions in English. These instructions should contain at least the following information:-

- name, address and email of the coordinator at the organising accreditation body;
- sample description and identification;
- names of tests to be performed on the samples;
- test methods to be used;
- accuracy and reporting units of results;
- reference to a supplied standardised results sheet;
- measurement uncertainty instructions.
- Deadline for reporting of results (reporting due date);
- Instructions on reporting the results.

The results sheet shall contain provision for at least the following information to be reported:

- assigned laboratory
- tests results for all tests;
- measurement uncertainty value for each test result;
- test method;
- signature of the participant
- date the results sheet was signed

The organising accreditation body may request any further information to assist the interpretation of the reported results.

The instructions and results sheet are sent to all participating laboratories with the samples and a copy is supplied to participating accreditation bodies. (refer Appendices E and F).

3.7 Receipt of results

The organising accreditation body (collaborator or sub-contractor, where applicable) receives the completed results sheet from the participating laboratories by the reported due date (refer section 4.2).

If any results are not received by the due date then the organising accreditation body should contact the participating accreditation body.

Once all results are received the organising body is responsible for the data entry and checking for preparation of the interim and final reports.

3.8 Interim report

The interim report is optional. If prepared after all results have been received the organising accreditation body may prepare an interim report detailing the consensus values for each test. This report will give an indication of each participating laboratory's performance in terms of their agreement (or otherwise) with the consensus values (refer Appendix G). If such a report is prepared it shall be sent to participating accreditation bodies and to the Chairman, APLAC PT Committee.

3.9 Z-scores

A convenient and international and regionally accepted statistical method for analysing test results is to calculate a z-score for each laboratory's result. A z-score is a normalised value which gives a "score" to each result, relative to the other numbers in the data set.

The organising accreditation body shall employ the z-score approach in evaluating participant results unless otherwise approved by the APLAC PT Committee.

A standard form for the calculation of z-scores is:

$$z_i = \frac{x_i - \bar{x}}{s}$$

where $\bar{x}$ is the assigned value (eg mean or median)
s is an estimate of the spread of all results (eg robust standard deviation or fitness for purpose criteria)

A z-score value close to zero therefore means that the result agrees well with those from the other laboratories.

The z-score approach described above, may be based on the mean ($\bar{x}$) and standard deviation (s) of the set of results. However, these "classical" statistics are significantly influenced by the presence of extreme results (ie inordinately high or low values) in the data set.
A robust alternative to the mean and standard deviation is the median and normalised inter-quartile range (IQR) respectively. Both the median ($\bar{x}$) and the IQR (s) are based on the ordered results.

For the evaluation of performance of each quantitative test result, the organising accreditation body shall interpret the z-score for each individual analyte as follows (ISO/IEC Guide 43):

$\lvert z\rvert <= 2$	Satisfactory
$2 < \lvert z\rvert < 3$	Questionable
$\lvert z\rvert >= 3$	Unsatisfactory

3.10 Confidentiality

It is the responsibility of the organising body to keep confidential at all times the identity of the participating laboratories. Codes numbers are to be randomly assigned ie <u>not</u> in chronological order of participation and should not identify economies or accreditation bodies.

Note that at the completion of the program that the Chairman, APLAC PT will distribute to the APLAC MRA signatories the identity of the APLAC MRA signatory participants.

3.11 Draft report

Once results have been received from all participants and the interim report has been issued the organising accreditation body will draft a final report which identifies participating laboratories only by a random code no. and includes :-

- APLAC logo on the cover page;
- the assigned values (consensus mean or median);
- the participating economies and number of laboratories;
- the reported test results for each participating laboratory identified by code number only;
- identification of outlier results;
- graphical displays of the test data (eg histograms, Youden diagrams and z-score charts);
- a copy of the instructions and results sheet;
- technical commentary (eg sources of error, method effects and overall performance).

This draft report shall be forwarded to participating accreditation bodies for their information and to the members of the APLAC Proficiency Testing Committee for review.

3.12 Final report

The organising accreditation body incorporates comments from the APLAC PT Committee. Upon receipt of approval the organising accreditation body distributes the report to each participating accreditation body and to the Chairman, APLAC PT Committee.

4. ROLE OF THE PARTICIPATING ACCREDITATION BODIES

4.1 Tasks

Each accreditation body is responsible for the following actions in their economy :-

- nominate the laboratories in their economy that will participate in the testing interlaboratory comparison (refer section 4.2);
- translating the testing instructions into the country's language, if necessary;
- arranging for the dispatch of the packaged addressed samples to each of their participating laboratories in their economy (and be responsible for associated transport costs);
- ensuring that the results are returned by their participating laboratories to the organising accreditation body by the due date;
- receiving a copy of the results sheet from each participant;
- undertake any necessary corrective action with participating laboratories according to the accreditation body’s policies.

4.2 Participating laboratories

The participating laboratories should normally be accredited by their participating accreditation body, or be applying for accreditation, for the particular tests which are to be conducted in the testing interlaboratory comparison. In order that a representative sample of laboratories can be compared, the accreditation body should, where possible, avoid selecting the same laboratories that have participated in previous APLAC testing interlaboratory comparison programs.

When the APLAC Proficiency Testing Committee considers it useful and feasible, laboratories outside APLAC may be invited to participate, for example, laboratories covered by EA, IAAC and ILAC unaffiliated bodies. However, existing APLAC members must be given first priority.

The participating laboratories receive the samples, instructions and results sheet from their participating accreditation body.

Once testing has been completed the participating laboratories are to send their results sheet to their participating accreditation body and also send a copy to the organising body by the reported due date (refer Appendices F and G).

4.3 Corrective action

Corrective action, if required, is the responsibility of the laboratory and their accreditation body and should be undertaken as soon as possible. Corrective action may vary from a discussion with the laboratory to withdrawal of the accreditation for the tests involved. Corrective action may be taken at the following stages:

- after having received the Interim Report;
- after having received the Final Report.

As a general rule, any laboratory z-score outside the range |z| >= 3 for any test would normally require corrective action.

5. REFERENCES

(1) APLAC MR001 (2006) *Procedures for establishing and maintaining mutual recognition agreements between laboratory accreditation bodies.*

(2) APLAC PT001 (2008) *Calibration interlaboratory comparisons.*

(3) APLAC PT004 (2006) *Measurement Audits*

(4) ISO/IEC Guide 43-1(1997) *Proficiency testing by interlaboratory comparisons - Part 1: Development and operation of proficiency testing schemes. Part 2: Selection and use of proficiency testing schemes by laboratory accreditation bodies.*

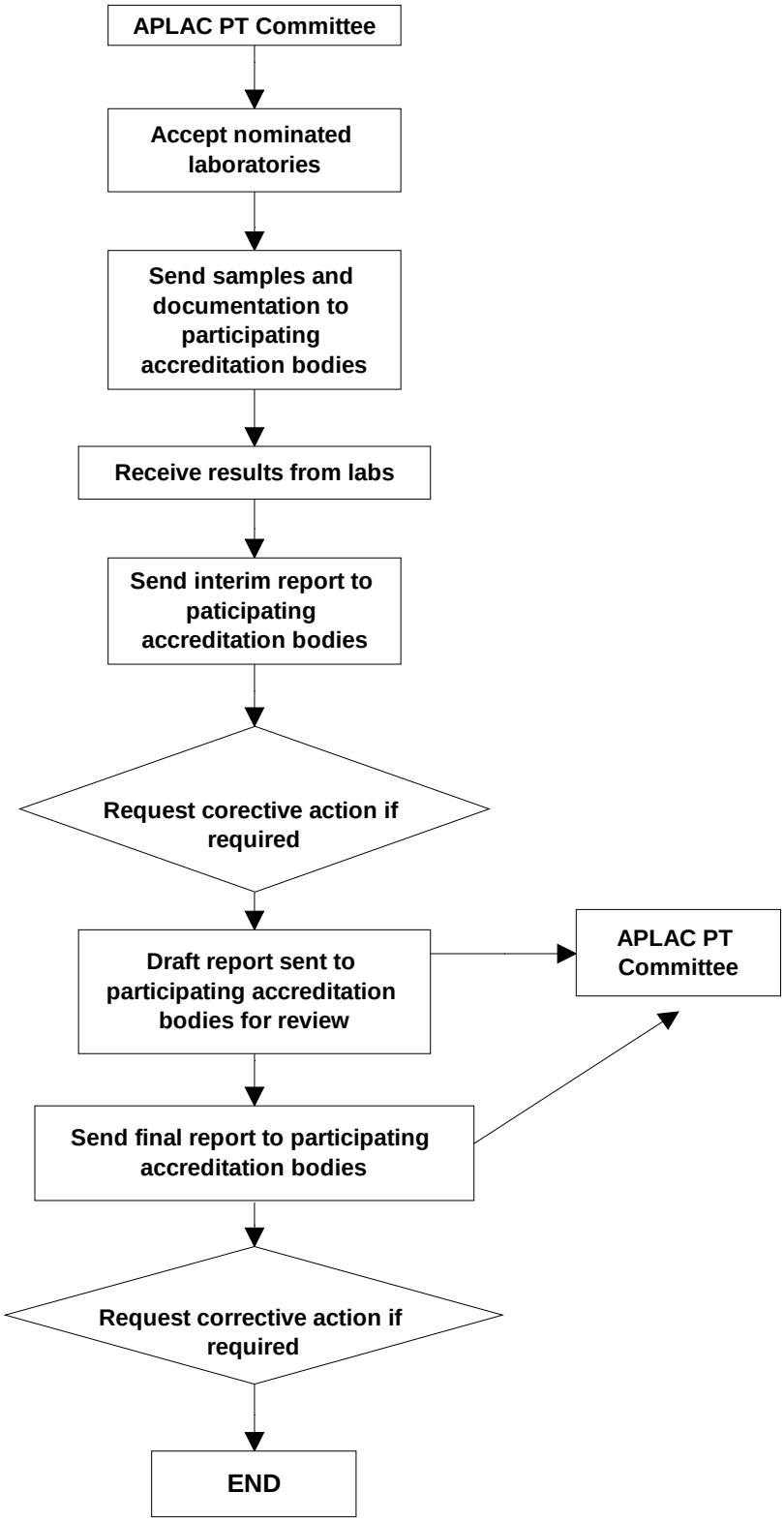
(5) ISO/IEC 17025 (2005) *General requirements for the competence of testing and calibration laboratories.*

(6) ISO 5725 (1994) *Accuracy (trueness and precision) of measurement methods and results - Parts 1-6*

(7) ISO 13528 (2005) Statistical methods for use in proficiency testing by interlaboratory comparisons.

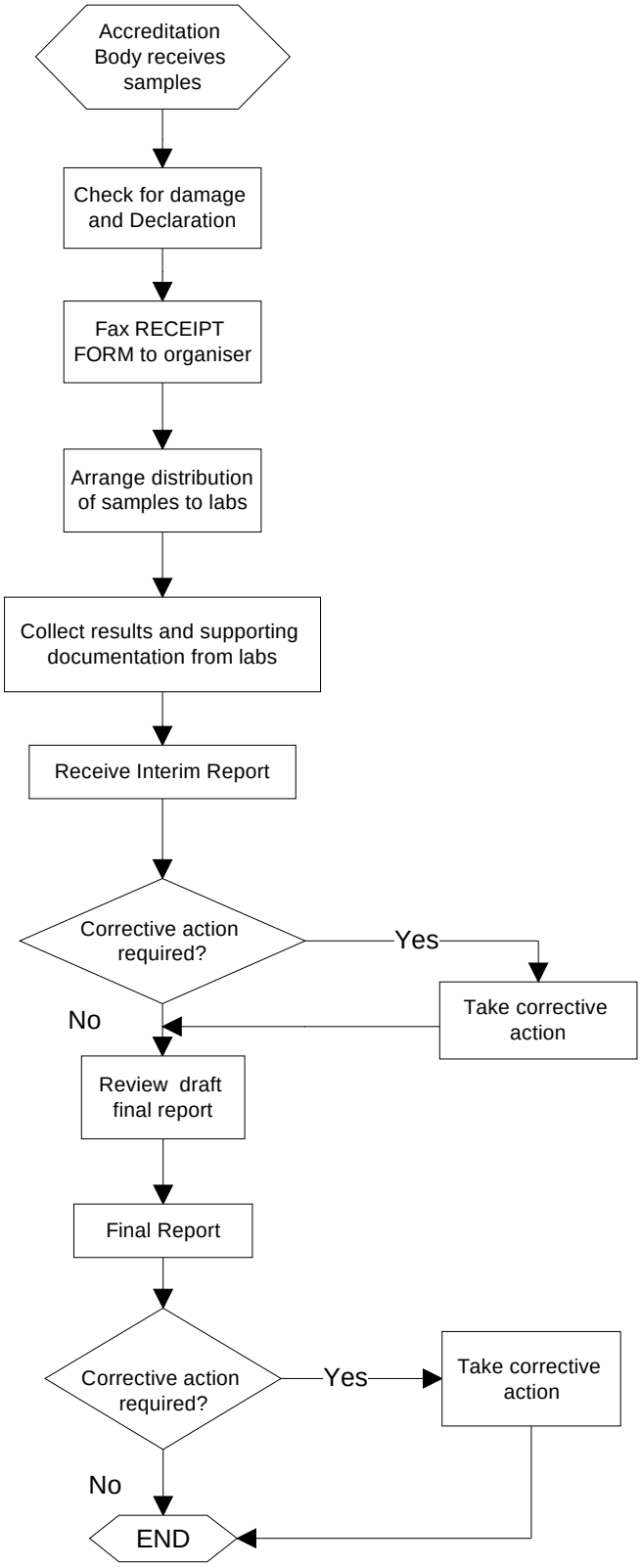
Appendix A

FLOWCHART FOR ORGANISING ACCREDITAION BODY



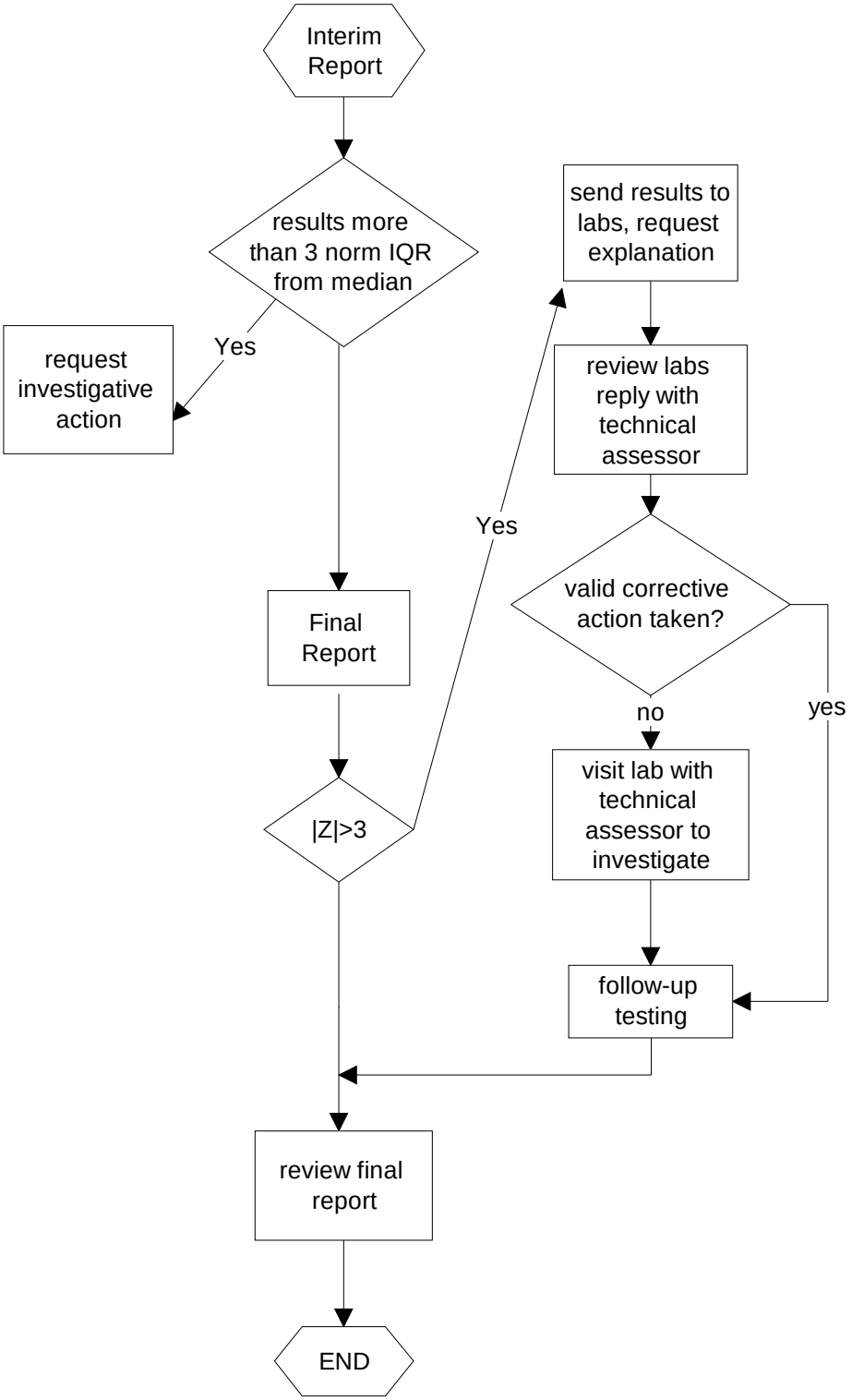
Appendix B

FLOWCHART FOR PARTICIPATING ACCREDITATION BODIES



Appendix C

FLOWCHART FOR CORRECTIVE ACTION



Appendix D
APLAC T00_ PROFICIENCY TESTING PROGRAM

INSTRUCTIONS TO ACCREDITATION BODIES

1. SAMPLES

Each laboratory is supplied (*sample description*).

2. TESTS TO BE PERFORMED

Please refer to your copy of the "INSTRUCTIONS TO PARTICIPANTS" and "RESULTS SHEET" enclosed.

3. SAMPLE DISTRIBUTION

The mailing tubes are addressed to each participating laboratory and contain the (*samples*), instructions and results sheet (marked with their confidential lab code No.). These are to be sent to the laboratories within one week of receipt date. There is no need to open the packaging.

4. DOCUMENTS TO BE SUBMITTED

a) **No later than (date)** participating laboratories are required to send the following to their accreditation body :-

(i) completed results sheet;
(ii) any supporting documentation to assist in the interpretation of the results.

b) **Also no later than (date)** participating laboratories are required to send a copy of the results sheet to the coordinator of the organising accreditation body.

The accreditation body is required to ensure that the above information has been supplied by their participating laboratories and should provide translations into English where necessary.

5. GENERAL INFORMATION

Additional information may be obtained from:

Organizing accreditation body coordinators contact details (name, email address, fax, phone)

Appendix E

APLAC T00_ ## PROFICIENCY TESTING PROGRAM

INSTRUCTIONS TO PARTICIPANTS

To ensure that results from this program can be analysed properly, participants are asked to adhere carefully to the following instructions.

1. Two 175 gram sachets of milk powder samples labelled APLAC 1 and APLAC 2 have been supplied to each laboratory *(sample description)*.

2. Testing may commence as soon as samples are received. Store your samples in the original packaging at room temperature until testing commences.

3. The following tests are to be performed on each sample in the reporting units and accuracy stated on the results sheet: *(list of tests)*
   - Moisture
   - Ash
   - Fat
   - Protein [calculated % Nitrogen x 6.38]
   - Free Fat (Solvent Extraction)
   - Insolubility Index
   - Titratable Acidity (Lactic acid)

   Analysts should be aware of analyte stability and perform the tests in an appropriate order.

4. Participants should use routine test methods which would normally be used to test customer supplied samples and record the method used on the results sheet *(Method details).*

   Report the Measurement Uncertainty (± % base) for each result. Refer to the attached Instructions – Measurement Uncertainty.

5. Send the completed result sheet and any supporting documentation to your accreditation body <u>and</u> fax a copy of the results sheet no later than *(Date)* to:

Organizing accreditation body coordinators contact details (name, email address, fax, phone)

INSTRUCTIONS – MEASUREMENT UNCERTAINTY

Part (1) Background information & justification for this change

ISO/IEC 17025 requires that, except under specified conditions, the uncertainty of measurement associated with the results of tests and measurements must be estimated.

What is uncertainty of measurement?
Uncertainty of measurement is defined as a "parameter, associated with the result of a measurement, that characterizes the dispersion of the values that could reasonably be attributed to the measurand" (the measurand is the particular quantity subject to measurement).

The result of a test or measurement is our best estimate of the true value of the measurand. The result is imperfect. The true value of the measurand is contained within a range of values about the measurement result and the "uncertainty of measurement" is an estimate of the magnitude of that range expressed at a given level of confidence (confidence interval). Uncertainty of measurement is usually given as a 95% confidence interval and would normally be expressed in the appropriate SI units (ie. mm, ℃, g/l, MPa etc).

For example, the result of a measurement might be 5.1 mg/l with an uncertainty of ±0.2 mg/l at a 95% level of confidence. This means that there is an estimated 95% probability that the true value is in the range 4.9 mg/l to 5.3 mg/l. The 95% probability means that there is an estimated one in twenty chance that the true value is outside that range.

Uncertainty of measurement may also be expressed as a percentage where appropriate.

To help laboratories to comply with the requirements of ISO/IEC 17025 for estimating uncertainty and to promote a uniform methodology in its estimation, information packages for APLAC PT testing program participants now include general guidance relating to estimating uncertainties for the specific testing involved, and final program reports will now include relevant worked examples. All program participants are required to report their estimates of uncertainty to their accreditation bodies along with their results unless in exceptional circumstances the Technical Adviser to the program specifically waives any requirement to estimate uncertainties. The estimates of uncertainty provided by participants will be incorporated into the final program reports enabling direct comparison of uncertainty estimates across the program participants. The uncertainty estimates will not be used in the evaluation of the results on the primary samples.

How is uncertainty of measurement to be estimated?
APLAC expects that program participants' uncertainties of measurement would be estimated in accordance with the requirements of the respective member accreditation bodies. There are different approaches and methodologies available. Worked examples provided in APLAC PT program reports will generally be based on ISO GUM but will recognise other methodologies in accordance with 5.4.6.3 NOTE 3 in ISO 17025.

Estimates of uncertainty of measurement provided by program participants are generally required to be given at the 95% level of coverage.

ISO GUM methodology

An estimate of uncertainty of measurement would usually be based on the combination of a number of influencing parameters (components of uncertainty) such as errors in reference values, instrument errors, repeatability, thermal effects, weighing errors, inhomogeneity etc. ISO GUM methodology requires that the influence of each component of uncertainty on the measurement result be quantified and expressed numerically as a standard deviation. These values are then combined according to the rules of the propagation of uncertainty to produce a combined standard deviation (combined standard uncertainty) and the combined standard uncertainty is multiplied by a coverage factor to produce an expanded uncertainty at the required level of confidence. Detailed descriptions and information on the implementation of this methodology have been published by ISO[2] , UKAS[3] and Eurachem/CITAC[4] and made available over the internet[7].

Uncertainty of measurement is best estimated within the individual laboratory environment. All factors which will have a significant influence on the test or measurement result must be included in the estimation process. There must be suitable programs using reference standards, instruments and materials to ensure on-going and adequate quality control and repeatability and reproducibility of methods and equipment over time. In many instances, it will be possible to use quality control data in assessing uncertainty components such as precision. Where these data are not available, it may be necessary to carry out precision studies or to rely on published information about the method or portions of it until the laboratory can obtain its own estimates.

APLAC is aware of the general need for better estimates of uncertainty, and estimates that are obtained under similar conditions in all laboratories. PT programs are useful mechanisms for spreading awareness of uncertainty of measurement and the effects of different ways of estimating it. We anticipate that the information made available through PT programs will help focus discussions on uncertainty of measurement.

APLAC Technical Committees will interpret the information and report on current practices. They will also make recommendations for improving the collection of uncertainty data, the estimation of uncertainties and incorporating data and information on uncertainty of measurement into PT program reports. Therefore we anticipate an evolution in the mechanisms for collecting and reporting uncertainty data and associated information over the next few years.

Participation in APLAC PT programs should assist laboratories to develop appropriate estimates of uncertainty, help to guide accreditation bodies to adopting common and consistent approaches leading to enhanced understanding and international comparability of measurements among the member nations.

APLAC will consider the use of estimates of uncertainty of measurement in the evaluation of its PT testing program results after it is satisfied that participating laboratories are estimating uncertainties of measurement in an appropriate and consistent manner.

Here are a few important terms:

Standard uncertainty ($u(x_i)$) is an input component of uncertainty x_i expressed as a standard deviation. It should be expressed in the units of the influencing parameter, but may be expressed as a percentage where convenient.

Type A evaluation estimates of standard uncertainty are evaluated by applying statistical techniques to a series of repeatability or curve fitting data. For example, a standard uncertainty estimated from the repeatability of measurements on replicate samples is a Type A evaluation.

Type B evaluation estimates of standard uncertainty are based on assumed probability distributions, experience, laboratory records, or other information. For example, a standard uncertainty estimated using data provided on a calibration certificate is a Type B evaluation.

Sensitivity coefficient (c_i) is the mathematical relationship between an influencing parameter and its effect on the result of a measurement. In many instances it is unity. That is, there is a one to one relationship between the value of the influence and its effect on the measurement result. For example, when weighing a sample of material, any uncertainty due to errors in the balance reading will have a one to one effect on the measurement result. On the other hand, if we are considering the influence of temperature on the length of a metal bar then the sensitivity coefficient is equal to the coefficient of linear thermal expansion for the metal bar multiplied by the length of the bar. It is important to note that a sensitivity coefficient has units. It is also important to note that the calculation methodology used by Eurachem/CITAC[4] incorporates sensitivity coefficients in a manner which does not require their specific evaluation.

Combined standard uncertainty ($u_c(y)$) is the final estimate of uncertainty for the test or measurement result y expressed as a standard deviation. It is calculated by multiplying the standard uncertainty $u(x_i)$ for each input component (x_i) with its respective sensitivity coefficient c_i to produce $c_i u(x_i)$ and then combining those values by taking the square root of the sum of their squares. Note that the products $c_i u(x_i)$ must each be expressed in the same units as those required for expressing the combined estimate $u_c(y)$.

Expanded uncertainty (U) is the final result of our estimate of uncertainty expressed as a confidence interval or coverage. It is calculated by multiplying the combined standard uncertainty by a coverage factor to produce the desired level of confidence (usually 95%).

Coverage factor (k) is a multiplier used to expand the combined standard uncertainty $u_c(y)$ to an interval that is estimated to contain the true value of the measurand at a given level of confidence ($U = k.u_c(y)$). The coverage factor then represents the number of standard deviations in the expanded uncertainty and is determined according to the Student-t distribution. A coverage factor of 2 is commonly used to approximate the expanded uncertainty to the 95% confidence level.

References

1. ISO-IEC 17025:1999. General requirements for the competence of testing and calibration laboratories. ISO, Geneva (1999)
2. Guide to the Expression of Uncertainty in Measurement. ISO, Geneva (1993)
3. UKAS LAB 12: The Expression of Uncertainty in Testing. UKAS, London (2000)
4. Eurachem / CITAC Guide QUAM:2000.P1. Quantifying Uncertainty in Analytical Measurement, 2nd Edition (2000)
5. ISO/DTS 21748:2002 Guide for the use of repeatability, reproducibility, and trueness estimates in measurement uncertainty estimation.
6. APLAC TC 005, Interpretation and Guidance on the Estimation of Uncertainty of Measurement in Testing
7. Websites: www.A2LA.org/ (for A2LA policies, links to guidance documents, including the UKAS Guide, and the Eurachem/CITAC Guide, at no cost)
   www.measurementuncertainty.org/ (Eurachem/CITAC Guide)
   www.fasor.com/iso25/ (general information, links, and discussion of ISO-IEC 17025)

Part (2) Evaluating participants' results

All APLAC PT program result sheets will provide a column on the PT results sheet to report an estimate of uncertainty of measurement for each reported measurement result. All estimates of uncertainty of measurement must be given as a 95% confidence interval ($k \approx 2$). The estimates would then appear in the final report, along with any relevant interpretations from experts. Detailed information on the estimation of the reported uncertainties must be provided to the relevant accreditation bodies for review and assessment.

The objective is to inform the participants so they can review and refine their own procedures and methodologies.

Program providers and technical advisers will include the reported uncertainty estimates either as summary data or directly with the submitted results.

APLAC PT testing programs will continue to use *z*-scores as the primary method for evaluating the relative performance of individual participant laboratories until such time as it is appropriate to incorporate quoted uncertainty estimates into the evaluation process and to assess performance using an appropriate statistical method.

Appendix F

APLAC T00_ ##PROFICIENCY TESTING PROGRAM

RESULTS SHEET

Laboratory Code:

Test	APLAC 1		APLAC 2		Method
	Result	Measurement Uncertainty (± % base)	Result	Measurement Uncertainty (± % base)	
Moisture (g/100g)					
Ash (g/100g)					
Fat (g/100g)					
Protein (g/100g)					
Free Fat – solvent extraction (g/100g)					
Insolubility Index (mL)					
Titratable Acidity – lactic acid (g/100g)					

REPORT ALL TESTS TO 2 DECIMAL PLACES (with the exception of Titratable Acidity to report to 3 decimal places)

Signature:_____ Date:_____

Appendix G

ASIA PACIFIC LABORATORY ACCREDITATION COOPERATION
APLAC T0_## PROFICIENCY TESTING PROGRAM

INTERIM REPORT

Test	Summary Statistics	APLAC Sample 1	APLAC Sample 2
Moisture g/100g	No. of Results	123	123
	Median	3.350	3.170
	Normalised IQR	0.252	0.230
Ash g/100g	No. of Results	119	119
	Median	6.080	6.179
	Normalised IQR	0.063	0.074
Fat g/100g	No. of Results	119	119
	Median	22.960	22.910
	Normalised IQR	0.511	0.493
Protein g/100g	No. of Results	120	120
	Median	24.445	24.800
	Normalised IQR	0.465	0.543
Insolubility Index mL	No. of Results	34	35
	Median	0.100	0.110
	Normalised IQR	0.067	0.074

Appendix H

CRITERIA FOR APLAC FUNDING

The following selection criteria have been developed by the APLAC Proficiency Testing Committee for funding support for program proposals for both testing and calibration interlaboratory comparisons. Such interlaboratory comparisons will initially focus on, but not be limited to types and ranges of tests and calibrations which are recognised as being related to APEC trade priorities.

APLAC funding shall be considered for any program that meets all of the following criteria:

- any APLAC member may act as a program coordinator;
- program proposals that have been reviewed and approved by the APLAC PT Committee;
- proposals must be accompanied by itemised estimated expenses;
- other regions and non-affiliated ILAC members shall be invited to nominate participating laboratories (testing programs only).

NOTE: Preference will be given to programs that support APEC trade priorities but this is not mandatory.

APLAC funding shall also be considered for:

- programs that may not support directly APEC trade related activity but that cover testing/measurement fields supporting domestic markets and APLAC MRA PT requirements.

APLAC funding shall be used by APLAC program coordinator(s) to cover:

- purchasing artefacts/samples to be used in the program;
- costs of homogeneity testing for testing samples;
- costs of primary calibration of measurement artefacts;
- sample/artefact packaging costs;
- transport costs of artefacts to accreditation bodies/samples to participating laboratories;
- costs of report preparation and distribution.

NOTE: Individual accreditation bodies shall be responsible for the costs of distribution of artefacts within their own economy and to the next participating economy.

The outcome of APLAC funding support will be to:

- provide objective data from PT to support the APLAC MRA;
- assist and encourage APLAC/APEC member economies to develop and implement proficiency testing programs within their own region;
- enhance the credibility of laboratories accredited by APLAC MRA signatories, leading to facilitation of APEC trade objectives;
- transparency of program outcome by including the economy code against each laboratory in each PT program report.

APLAC members seeking funding support shall submit a request to the APLAC Secretariat (+ copy to the APLAC PT Chairman) with supporting details for consideration at the next scheduled APLAC Board of Management meeting.

Appendix I

APLAC Funding Support Application

Proficiency Testing

1. Name of Accreditation Body_____

2. Type of Program (Calibration or Testing)_____
_____

3. Has the program proposal been reviewed and approved by the APLAC PT Committee? (Yes/No)_____
Date of Approval_____

4. Name of program_____
_____

5. Sample/artefact details_____
_____
_____
_____
_____
_____
_____

6. Testing/Calibration parameters to be measured_____
_____
_____
_____
_____
_____
_____
_____

7. Detail how this proposal will support APEC trade related activity and/or domestic markets_____
_____
_____
_____
_____

8. Is this program a repeat of a previously completed APLAC program or does it cover a new area of testing/calibration?_____
_____
If a repeat of a previous program give reasons for the repetition. _____
_____
_____
_____
_____

9. Which regions and/or non-affiliated accreditation bodies have been invited to participate?_____
_____
_____

10. Please attach:
- itemised estimated program expenses;
- any other supporting documentation.

Contact name _____
Signature _____
Date_____