
“Quality Infrastructure Services for Renewable Energy Sources and Energy Efficiency in Latin America and the Caribbean”

“Project Nro 95069 / BMZ Nro: 2011.2026.0”

REPORT

on the Mission to Guatemala IAAC Meeting and related Events

Ciudad de Guatemala, Guatemala

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[optional]



QUALITY INFRASTRUCTURE FOR RENEWABLE ENERGY SOURCES & ENERGY EFFICIENCY
IN LATIN AMERICA AND THE CARIBBEAN

Abbreviations/Definitions

BIPM	International Bureau of Weights and Measures
CIPM	International Committee for Weights and Measures
CIPM MRA	Mutual Recognition Agreement of the CIPM
CGPM	General Conference on Weights and Measures
JCRB	Joint Committee of the Regional Metrology Organizations
KCDB	Key Comparison Data Base
LAC	Latin America and Caribe
NMI	National Metrology Institute
QSTF	Quality Systems Task Force
RMOs	Regional Metrology Organizations

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1. INTRODUCTION

In the framework of the Energy Efficiency and Renewable Energies project for LAC countries, one of the elements of the project defined by the five partners is to strengthen elements of conformity assessment systems related to the quality assurance of solar thermal heaters and the energy efficiency labelling programme in household appliances. However, the conformity assessment activities are supported by measurements, which would have to be traceable.

The traceability in the region is diverse and it is relevant to know which is its real situation and how different it is from other communities. The Accreditation Bodies need to assure the measurement traceability of the conformity assessment activities, they accredit.

A new version of the Traceability Policy for the community of Accreditation Bodies (ABs) has been issued and it is necessary to understand how to fulfil this policy and more important than this, it is how to address the measurement assurance of the conformity assessment bodies accredited.

The workshop shall provide to the participants the approach of the current version of ILAC P10, to understand what is new and discuss how ABs can fulfil it, taking into account the real situations of their countries in traceability subjects.

This needs to be discussed will take into account the relevant mechanisms within the CIPM MRA.

2. EXECUTIVE SUMMARY

3. OBJECTIVES

- Present top level measurements for some key quantities as an example related to energy efficiency and renewable resources among others.
- Strengthen the abilities/skills of the IAAC Representatives in the use of the Key Comparison Data Base (KCDB) of BIPM.
- Discuss strategies implemented by the ABs for the fulfilment of the ILAC Policy on the Traceability of Measurements Results – ILAC P10:01/2013.
- Improve the consistency in the evaluation processes of the fulfilment of the ILAC Policy on the Traceability of Measurements Results – ILAC P10:01/2013.

4. MISSION DEVELOPMENT

a) Logistic and Coordination

The preparation of the workshop, which consists mainly in preparing:

- The Workshop concept

- The Workshop program (See Annex A)
- Selection of experts from SIM and NVLAP

was made in coordination with Mrs. Julia Sancricca, President of the IAAC Laboratory SubCommittee and Mr. Warren Merkel, from NVLAP (USA Accreditation Body)

I coordinated mainly with

- Mrs Julia Sancricca,
- Mr. Warren Merkel and
- Mrs. Claudia Santo, President of the Technical Committee of SIM and expert of the workshop.
- Mr. Warren Merkel, from NVLAP and Moderator of the Workshop coordinated with Mrs. Barbara Belzer and Sally Bruce from NVLAP, both of them, experts of the workshop.

The coordinated activities consist on:

- Discussing and agreement about the subjects and contents to be presented by the SIM Representative and the way to do it, in close coordination with the President of the IAAC Laboratory Sub-Committee and Mr. Warren Merkel.
- Content of the presentations showed by the NVLAP Experts according to the program and objectives

We also agreed to have a presentation of three Accreditation Bodies previously selected because of their differences in the metrological traceability level.

- a) OSA from El Salvador
- b) ECA from Costa Rica
- c) ONA CONACYT from Nicaragua

In order they comment us about their corresponding Traceability Policy.

b) Development of the Workshop

The moderation was in charge of Mr. Warren Merkel and I support him as needed in the development and co-moderation of the Workshop

SIM Presentation

The presentation of SIM was in Spanish language because of the attendants.

During the contribution of Mrs. Claudia Santo, SIM representative and President of the Technical Committee of SIM the participants highlighted the relevance of having a representative of SIM in the workshop, Her presentation was planned by about 30 minutes however it lasted nearly 1 hour and a half, and Mr. Merkel and me decided naturally to let her to finish it because of the relevance to know how SIM see the metrological traceability and the ILAC P10.

Some key issues discussed were the terms of Calibration and Verification. The definitions are in the following boxes:

Calibración:

Operación que, bajo condiciones especificadas, en primer lugar, establece la relación entre:

- a) los valores de una magnitud con su incertidumbre de medición provistos por patrones o materiales de referencia
- b) y los valores correspondientes a las indicaciones provistas por un sistema de medición con su incertidumbre y utiliza esa información para obtener un resultado de medición de la indicación provista

Verificación

Confirmación, mediante examen y adquisición de evidencias objetivas, del cumplimiento de las especificaciones teniendo en cuenta la incertidumbre de medición.

It was also presented the following terms:

- Measurement standard (Patrón de Medición)
- International Standard (Patrón Internacional)
- National Standard (Patrón Nacional)
- Primary Standard (Patrón primario)
- Secondary Standard (Patrón secundario)
- Reference Standard (Patrón de referencia)
- Work Standard (Patrón de trabajo)
- Metrological Traceability (Trazabilidad Metrológica)

She highlighted also the relevance to be oriented to maintain the uninterrupted comparability chain so it would mean we need to be referred to a National Metrology Institute (NMI) or a Designated Institute (DI)

It was shown also how a CMC gets to be declared in the KCDB

About the CIPM MRA

CIPM MRA Objective

Establish the degree of equivalence of national measurement standards maintained by NMIs.

Provide for the mutual recognition of calibration and measurement certificates issued by NMIs.

Provide governments and other parties with a secure technical foundation of wider agreements. related to international trace, commerce and regulatory affairs.

CIPM Key Concept

The technical basis for this arrangement is the set of results obtained during the key comparisons carried out by the Consultative Committees, the BIPM and the RMOs.

RMO key comparisons: the RMO key comparisons extend the metrological equivalence established by the CIPM key comparisons to a greater number of national metrology institutes including those of States or Economies that are Associates of the CGPM.

Nothing in this arrangement restricts the rights under the Metre Convention of participating national metrology institutes to have their national standards calibrated by the BIPM or by another national metrology institute. The mutual recognition of such standards depends upon subsequent participation in key or supplementary comparisons.

RMOs may carry out supplementary comparisons to meet specific needs not covered by key comparisons.

JCRB provides a forum for coordination, among the regions, of supplementary comparisons to bolster confidence in calibration and measurement certificates.

Many smaller States (economies) cannot allocate funds sufficient to meet the cost of membership in the Metre Convention (21st CGPM, 1999) Resolution 3 so that it was decided to “assume a responsibility to provide those States with the means to establish links to the world’s measurement system to provide recognition of the traceability of their measurements to the SI”.

Association of the national metrology institutes with the RMO (SIM) ensures the participation.

The national measurement standards that support the CMCs of a NMI or a Designated Institute (DI) are primary realizations of the SI or traceable to these primary realizations of the SI by other NMIs, through the CIPM MRA. These CMCs have to be declared with an appropriate measurement uncertainty or through the calibration and measurement services offered by the BIPM.

Other laboratories which are covered by the ILAC Agreement provide the traceability route to the SI through the realizations of the signatory NMIs, which reflects the complementary role of the CIPM-MRA and the ILAC Arrangement.

On the other hand, according to the Metre Convention the MRAs would have to be signed by the NMIs, not by other organizations, however, in some economies, there are Designated Institutes (private or public) which could be involved through its corresponding NMI (of its country). It would mean that this institution could also participate in the key comparisons in order to declare their CMCs through the NMI.

About the QSTF

The process for evaluating the QMS of a NMI, according to the ISO/IEC 17025 is quite similar to the process of accreditation of laboratories, however I could mention the following characteristics:

- The revision of the ISO/IEC 17025 Chapter 4 is valid for all the quantities and scopes the NMI presents
- A QMS presented is valid for 18 months
- For declaring CMCs for instance for length and mass, it is only necessary standard blocks and standard masses. There are not CMCs declared for other instruments in these quantities, as verniers or analytical balances

The evaluation of the technical personnel of the NMI or DIs, should have to be done by personnel with equivalent technical competence, so it would mean by a peer professional. These professionals usually work in other NMIs or DIs

About the ILAC P10 and how to face its implementation

Based on the presentations showed it has been prepared the following schemes mainly addressed to:

- The ABs
- The peer evaluators

Table 1
Recommendations for the Accreditation Bodies

Knowledge about the NMI	Action Plan of the Accreditation Body
	
<input type="checkbox"/> Learn about the economy`s NMI Determine the status with the CIPM	<input type="checkbox"/> Rapport about the Situation of the NMI
<input type="checkbox"/> MRA: Signatory, Associated (be able to participate in CIPM MRA, Not member	<input type="checkbox"/> Accreditation Body Traceability Policy
<input type="checkbox"/> Dialog with the NMI and its experts	<input type="checkbox"/> Adjustment of current Guidances for CABs in the traceability subjects as applicable
<input type="checkbox"/> Have available this information to the reigion and provide it as required.	<input type="checkbox"/> Assessor Training
	<input type="checkbox"/> Evidence on Traceability Pathways
	<input type="checkbox"/> Provide this infomation to the region as required

Table 2
Recommendations for Peer Evaluators

Documental Peer Evaluation



- Read the Traceability Policy
- General knowledge about the NMI, for instance, through web page
- Determine the NMI status with the CIPM MRA
Review and use the Appendix C (KCDB) as Guidance. And also Appendix B (Supplementary Comparisons), as necessary
- Determine the existing gaps
- Before each peer evaluation review these information, it could change.
/Determine the CMCs changes

On-Site Peer Evaluation



- Verify the application of the Traceability Policy (check facts, clarifications with ABs)
- Ask for those participations in key comparisons in progress and review the report status
- Look for traceability pathways to another NMI. Review if they apply Option 3a of ILAC P10
- Look for traceability pathways to secondary calibration labs See if they apply Option 3b of ILAC P10.
- Visit the NMI as necessary or for an specific objective (See Table 3)

Table 3
When it is necessary to visit the NMI during the peer evaluation

Visit to the NMI when ...



- It is not a signatory of the CIPM MRA
- it is signatory but CMCs are not listed in the CIPM-MRA
- For checking key and supplementary comparison status
- For confirming CMCs available, not declared. (Scope not covered by the CMCs)

CASES STUDY

In the afternoon, there was a block for the discussion of different cases or situations in which any AB member of IAAC could be.

As a general way, it is relevant to consider the following activities:

- Establishment of the Traceability Policy according to ILAC P10
- Training of the AB personnel and its assessors in the Traceability Policy
- Dissemination of the Traceability Policy
- Periodic revision of the Traceability Policy
- Evidences about the assessment of the application of the Traceability Policy

However, considering the following five cases some activities which could be considered as:

- Expectations for the AB,
- Peer evaluation tasks,
- Expectations for the NMIs, are shown in the following pages.

CASE 1

AB has the Testing Lab Accreditation Program

NMI is not member of SIM

Expectations for the AB

- Policy addressed to its clients (testing lab) in which they could demonstrate the competence of the traceability providers
- Identify the scope of the CABs accredited and the traceability that needs to be covered
- Encourage the use of the Calibration Labs (National or International) accredited by a signatory AB and the signatory International Metrology Institutes to cover the traceability demanded by the Testing Labs. accredited.
- The AB with the support of external experts could assess the NMI (not member of SIM) in the scope required by the accredited CABs (Option 3a of ILAC P10) and the Calibration Labs non accredited (Option 3b of ILAC P10)
- The AB takes the decision respect to the last point, based on the outcome of the evaluation

Peer Evaluators Tasks

- Confirm the AB Personnel, including the assessors understand the established policy
- Evaluate how the AB disseminates the policy and is aimed to ensure it is applied by the CABs
- Confirm if the policy is being assessed. In the witnessed assessments confirm if the AB assessors revise if the CABs accredited apply the policy.
- Review the competence of the assessors and the experts, as suitable, to evaluate the traceability and the traceability policy
- Visit to the NMI in the on site peer evaluation

Expectations for the NMI

- Not so much
- Maintenance of national standards
- Grant calibration services
- NMI lets the audits from the AB with technical experts while the NMI gets the membership of SIM and the AB implements the Accred. Program for Calibration Labs.

CASE 2:

AB has the Testing Lab. Accreditation Program recognized but not the scope of the Calibration Lab. Accreditation Program

NMI has not declared the CMCs

Expectations for the AB

- Identify the scope of the CABs accredited and the traceability that needs to be covered
- **Identify the traceability with those NMIs of other countries with CMCs declared in the scope required. and encourage the testing labs., be traceable to these NMIs.**
- Identify the scope required, covered by the Calibration Labs accredited with signatory ABs for the Calibration Lab Accreditation Program
- Identify the scope required, covered by the NMI (not signatory)
- Evaluation of the NMI with Annex A of ILAC P10 for the quantities covered by this institution, including those ones in which the NMI could be participating in intercomparisons. (Option 3a of ILAC P10)
- The AB takes the decision respect to the last point, based on the documentation received by the NMI.

Peer Evaluator Tasks

- Traceability Policy according to ILAC P10, ask doubts
- Review of the scopes (testing and calibration labs.) accredited by the AB
- The Policy would have to indicate: - recognized sources for determining the traceability, - mechanisms to evaluate it, - how the AB inform to interested parties this traceability policy (assessors training, publication of the traceability policy)
- Confirm if the policy is being assessed. In the witnessed assessments confirm if the AB assessors revise if the CABs accredited apply the policy.
- Review the competence of the assessors and the experts, as suitable, **to evaluate the traceability and the traceability policy**
- **Visit to the NMI in the on site peer evaluation**

Expectations for the NMI

- On site visit, asking for solving pending doubts. It could include a potential visit to the NMI

CASE 3:

AB has the Testing and Calibration Lab. Accreditation Program recognized

NMI is accredited by a signatory AB, but not for all the scope demanded by the Testing Lab.

Accreditation Program of the AB

Expectations for the ABs

- Identify the scope of the CABs accredited and the traceability that needs to be covered
- Identify the scope of the NMI accredited by the signatory AB (Option 2 of ILAC P10)
- Identify the scope accredited by the Calibration Labs with the National AB or another signatory AB.
- Evaluation of the NMI with Annex A of ILAC P10 for the quantities required by the accredited CABs not covered by the recognition or in which the NMI is participating in intercomparisons (Option 3a of ILAC P10)
- The AB takes the decision respect to the last point, based on the documentation received by the NMI.

Peer Evaluator Tasks

- Review the Traceability Policy according to ILAC P10
- Review the web page of the AB in order to get knowledge of the scopes of the accreditation programs
- Compare the information given by the AB respect to the traceability sources of the NMI and confirm if the traceability needs are covered by the NMI according to this information
- Confirm if the policy is being assessed. In the witnessed assessments confirm if the AB assessors revise if the CABs accredited apply the policy.
- In case the policy makes reference to the Options 3a and 3b of ILAC P10, review the records of the AB about this application
- Review the competence of the assessors and the experts, as suitable, **to evaluate the traceability and the traceability policy**

Expectations for the NMI

- NMI knows its situation about its accredited scope, covered by the signatory AB
- NMI has provided the complete and current information to the AB.

CASE 4:

AB has the Testing and Calibration Lab. Accreditation Program recognized

NMI has declared some CMCs (not the majority), but not for all the scope demanded by the Testing Lab. Accreditation Program of the AB

**Expectations
for the AB**

- Identify the scope of the CABs accredited and the traceability that needs to be covered
- Identify the CMCs availability, in order to identify the scope in which the CMCs has not been declared.
- In case the CMCs are not declared and the NMI is participating in interlaboratory comparisons go to Annex A of the ILAC P10. (Option 3a of ILAC P10)
- Establish a criterion to accept or not the information given by the NMI.
- The AB Policy would not going to allow calibration labs that are non accredited (So it is proposed not to use Option 3b of ILAC P10)
- For the calibration scope demand of the IBs and CBPs, it could be applied Option 3a of the ILAC P10

**Peer Evaluator
Tasks**

- Review the web page of the AB in order to get knowledge of the scopes of the accreditation programs
- Compare the information given by the AB respect to the traceability sources of the NMI
- Review the CIPM MRA to confirm the informaiton declared by the NMI
- Analyze what it is established in the MD002 to evaluate the neccessity to visi the NMI in the on-site evaluation
- Review the Traceability Policy or equivalent document, which would have to fulfill the ILAC P10.
- Confirm if the policy is being assessed. In the witnessed assessments confirm if the AB assessors revise if the CABs accredited apply the policy.
- In case the policy makes reference to the Options 3a and 3b of ILAC P10, review the records of the AB about this application
- Review the competence of the assessors and the experts, as suitable, to evaluate the traceability and the traceability policy

**Expectation for
the NMI**

- NMI knows its situation about the CMCs
- NMI has provided the complete and current information to the AB.

Case 5:

AB has all the Accreditation Programs recognized

NMI has declared nearly all the CMCs but do not cover all the metrological aspects as: measurement uncertainty level, accuracy level or ranges required by the CABs accredited.

**Expectations
for the AB**

- Identify the scope of the CABs accredited and the traceability that needs to be covered
- Identify the CMCs availability, in order to identify the scope in which the CMCs has not been declared.
- In case the CMCs are not declared and the NMI is participating in interlaboratory comparisons go to Annexe A of the ILAC P10. (Option 3a of ILAC P10)
- Establish a criterion to accept or not the information given by the NMI.
- For the calibration scope demand of the IBs and CBPs, it could be applied Option 3a of the ILAC P10

**Peer Evaluator
Tasks**

- Review the web page of the AB in order to get knowledge of the scopes of the accreditation programs
- Compare the information given by the AB respect to the traceability sources of the NMI
- Review the CIPM MRA to confirm the information declared by the NMI
- Analyze what is established in the MD002 to evaluate the necessity to visit the NMI in the on-site evaluation
- Review the Traceability Policy or equivalent document, which would have to fulfill the ILAC P10.
- Confirm if the policy is being assessed. In the witnessed assessments confirm if the AB assessors revise if the CABs accredited apply the policy.
- In case the policy makes reference to the Options 3a and 3b of ILAC P10, review the records of the AB about this application
- Review the competence of the assessors and the experts, as suitable, **to evaluate the traceability and the traceability policy**

**Expectation for
the NMI**

- NMI knows its situation about the CMCs
- NMI has provided the complete and current information to the AB.

Some conclusions based on the cases presented and additional reflections

1. It is demanded an Interpretation Guide of the ILAC P10 for the different cases exposed in the workshop. This guide could consider the subjects of:
 - Scope of accreditation
 - Traceability demand of the accredited CABs to be covered.
 - Address the cases for calibration laboratories, medical laboratories, inspection bodies, certification bodies for product.
2. Present to ILAC this point of view as a region. The IAAC members shall support this position as a region.
3. For the quantities which do not have any CMC declared the policy could establish:
 - i. Ask the NMI if they have approved the QS or the QSTF for this quantity
 - ii. Make an evaluation with an expert from other NMI in the corresponding quantity (taken into account the scope).
 - iii. Take into account Appendix B of KCDB
 - iv. Establish clearly in the Traceability Policy the quantities which could be traceable to a reference method. (See clause 5.6.2.1.2 of ISO/IEC 17025:2005 and the Option 4 of the ILAC P10).
4. In the **Case 4** there is a proposal not to consider Option 3b of ILAC P10. Indeed, in the **Cases 1 to 3**, there was not any comment about the use of this option of the ILAC Policy either. However it is considered in the **Case 5**, when perhaps the AB would have to face with the fulfillment of the metrological traceability of some quantities with measurement ranges, accuracy or measurement uncertainty more complex or difficult because of their availability in the *market*. or its existence.
5. A key issue in the application of the ILAC P10 and in consequence in the fulfillment of the traceability policy of each AB, is "the scope". However, is the scope declared by the IAAC members in an equivalent or acceptable way?. It is relevant to take into account:
 - The measurement range
 - The accuracy
 - The measurement uncertainty
 - The calibration method
 - The calibration procedure

It is relevant to discuss this subject in the following Traceability Workshop

5. CONCLUSIONS

It has been clarified some key and contentious terms as calibration and verification.

We have got in the same meeting the Metrological Traceability SIM and IAAC point of view. It has been a good first step to go towards a common understanding about this subject respecting the position and opinions of both of them

It has been understood a bit more the CIPM MRA Concept and Objective and its process by the accreditation community.

It has been got very good strategies for the ABs and for the peer-evaluators to implement the metrological traceability according to requirements of the ILAC P10 Policy, in a general way and more specifically, considering five different cases about the metrological traceability situation of the ABs in the LAC region.

6. RECOMMENDATIONS

Table 4

What?	Who?	When?
Discussion about the next subjects for the following workshop We would consider the “conclusions based on the cases presented and additional reflections” mentioned	W. Merkel J. Sancricca LSC Members I. Zuta	Till early December 2014
Next Traceability Workshop	I.Zuta W. Merkel J.Sancricca	Till August 2015 Note: There is a proposal to be done by April 2015, jointly with the QSTF Meeting of SIM

7. ANNEX

7.1. AGENDA

Topic	Presenter	Time
Welcome	OGA Representative	08:55– 09:00 h
Overview of CIPM MRA and Appendix C	SIM Representative	09:00– 09:30 h
ILAC P10:01/2013 and MD 002	IAAC Representative	09:30 – 10:45 h

Topic	Presenter	Time
Break		10:45 – 11:15 h
ILAC P10:01/2013 and MD 002	IAAC Representative	11:15 – 12:00 h
Evaluator tasks related to P10	IAAC Representative	12:00 – 13:00 h
Lunch		13:00 – 14:00 h
Presentations of some ABs about the situation in their countries: <ul style="list-style-type: none"> - Traceability policies - Gaps 	ECA (Costa Rica) representative ONA (Nicaragua) representative OSA (El Salvador) representative	14:00 – 14:30 h
Case study discussions based on WG report <ul style="list-style-type: none"> - Small groups discuss individual cases where there's a gap and how AB has or could handle it - Identify what information would be needed to support traceability - Present results to full group Note: Depending on number of attendants (04 or 05 groups)	Participants, instructors and Traceability WG Members	14:30 – 15:45 h
Break		15:45 – 16:15 h
Case study discussions based on WG report <ul style="list-style-type: none"> - Small groups discuss individual cases where there's a gap and how AB has or could handle it - Identify what information would be needed to support traceability - Present results to full group 	Participants, instructors and Traceability WG Members	16:15 – 16:45 h
Group discussion of how outcomes could translate to guidance documents <ul style="list-style-type: none"> - For evaluators - For ABs to provide labs to support 3 a) or 3 b) 	IAAC Representative	16:45 – 17:15 h
Next steps	Team	17:15 – 17:45 h

7.2. LIST OF CONTACTS

See file attached

7.3. UP DATE OF ANNUAL OPERATIONAL PLAN