Review on how proficiency testing needs in Brazil are supplied by accredited providers by Cgcre

M H Moura\(^1\) and R M H Borges
National Institute of Metrology, Quality and Technology (INMETRO), Duque de Caxias, RJ, Brazil

E-mail: mhmoura@inmetro.gov.br

Abstract. Proficiency testing schemes are an important tool to quality assurance in measurement as well as a tool to harmonization of multilateral recognition arrangements for accreditation. The General Coordination for Accreditation (Cgcre) of INMETRO developed a new program to accredit proficiency testing providers according with the International Standard ISO/IEC 17043. This work presents a review on needs for proficiency testing schemes in Brazil and assesses how these needs are supplied by accredited providers.

1. Introduction
Laboratory accreditation is a means of determining the technical competence of laboratories to perform specific types of testing and calibration, providing the formal recognition to competent laboratories, thus a ready means for customers to identify and select reliable testing, measurement and calibration services able to meet their needs. According with the international standard ISO/IEC 17025 accredited testing and calibration laboratories shall establish quality control procedures for monitoring the validity of tests and calibrations undertaken. This monitoring shall be planned and reviewed and may include participation in interlaboratory comparison or proficiency testing schemes [1].

The need for ongoing confidence in laboratory performance is not only essential for laboratories and their customers but also for other interested parties, such as regulators, laboratory accreditation bodies and other organizations that specify requirements for laboratories [2], which can be demonstrated through laboratory participation in a proficiency testing scheme. Besides, the International Standard ISO/IEC 17011 [3] and the document published by the International Laboratory Accreditation Cooperation (ILAC), ILAC P9, establish as a requirement the accreditation bodies shall consider the participation and the performance of laboratories in proficiency testing schemes [4].

Proficiency testing providers are organizations that develop and operate proficiency testing schemes [2] and their competence can be evaluated based on ISO/IEC 17043 published in 2010 replacing the ISO Guide 43:1997 and ILAC-G13:08/2007 document [5].

In line with the ILAC resolutions [6, 7], accreditation bodies have implemented programs to guarantee the accreditation of proficiency testing providers in different regional cooperations for accreditation.

\(^1\) To whom any correspondence should be addressed.
1.1. National review

In Brazil, the General Coordination for Accreditation (Cgcre) of the National Institute of Metrology, Quality and Technology (INMETRO) is the legally recognized accreditation body to perform the activities of accreditation of calibration and testing laboratories, proficiency testing providers and other conformity assessment bodies [8].

According to statistical data from March 2013, there are 836 testing and calibration laboratories accredited by Cgcre, which stimulates the demand for proficiency testing schemes in Brazil since the Cgcre policy requires regular participation of its laboratories in proficiency testing activities [9]. In order to encourage the provision of proficiency testing programs in Brazil by organizations with recognized competence Cgcre developed the modality of accreditation of proficiency testing providers. It was established initially a pilot project aimed at learning this new modality [10], as requirements of ILAC-G13:08 guide, prevailing at the time.

This paper presents how the program for accreditation of proficiency testing providers was developed by Cgcre and evaluates the meeting the demand in Brazil for proficiency testing schemes by accredited providers. In the context of a larger study still under development, which includes this work, it will explore the characteristics and demands of the proficiency testing schemes, regulatory requirements, criteria for selection of programs, studies of homogeneity and stability of proficiency testing items and statistical methods among other aspects, in order to subsidize Cgcre in improving its process.

2. Basis for the accreditation program of proficiency testing providers by Cgcre

2.1. Overview

The Brazilian Accreditation Body (Cgcre) decided to establish a proficiency testing provider (PTP) accreditation program based on the experience of the United Kingdom Accreditation Service (UKAS). In 2006, it was published in Accreditation and Quality Assurance an article about the pilot accreditation program of reference materials producer accreditation (RMP), involving five participant organizations. The accreditation criteria used by UKAS was ISO Guide 34 in combination with ISO/IEC 17025. Considering this paper, Cgcre established a similar approach to implement a pilot program for PTP accreditation based on ILAC G13.

Table 1 shows the steps followed to implement the PTP accreditation in Brazil.

| Period | Activities |
|--------|------------|
| 2006   | Study of technical feasibility. |
| 2008   | Training course to assessors and the Cgcre’s staff including presentations from international experts in PTP accreditation. |
| 2009   | Establishment of documentation for the implementation of the pilot program in Brazil. I Seminar opened to the public to more than 170 people with presentations done by representatives of ILAC and APLAC, also training Brazilian professionals, assessors and Cgcre’s staff. Revised documents were made available in Cgcre’s website and the PTP were invited to apply for accreditation, till October 2009. Received applications were reviewed by a group of Cgcre’s assessors and professionals. Twelve out of fourteen applications were accepted in the pilot accreditation program. |
Document review of PTP by trained assessors, including statisticians.

**2010/2011** Dates for the assessments were scheduled and the assessment visits were carried out in 12 PTP facilities, from October 2010 to April 2011. Delivery of certificates for granting accreditation to 12 providers in September 2011 at the 2nd Workshop on Accreditation of PTP.

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2.2. *Implementation of the accreditation program in the Cgcre’s process*

With the experience and improvement process in the pilot project, the new modality was offered to all interested PT providers following the Cgcre’s process in 2011. Up to now, there was 1 new request for initial accreditation and 3 requests for the extension of the scope of accreditation.

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3. **Analysis of needs of proficiency testing schemes in Brazil**

3.1. *Needs for PT schemes*

Testing and calibration laboratories accredited by Cgcre represent much of the specific needs for proficiency testing schemes in Brazil in their different fields of activities. A survey with accredited laboratories until March 2013 for each field of activity (for testing laboratories) and each group of calibration services, shown in figure 1 and figure 2 was performed.

![Figure 1. Number of testing laboratories accredited by Cgcre according to fields of activity.](image-url)
Figure 2. Number of calibration laboratories accredited by Cgcre according to groups of calibration service.

3.2. Offering of proficiency testing schemes

Based on the scopes of accredited PTP, the available schemes were categorized for the same fields of activity and groups of calibration services. Additionally, a survey was conducted with the accredited PT providers, identifying 11 (92%) of the 12 PT providers are planning to request extension of their scopes of accreditation for other schemes over the next three years, including different proficiency testing items and statistical approaches.

Figure 3 and Figure 4 show the number of accredited and non-accredited proficiency testing schemes (with possible extension of accreditation scope) offered by PT providers accredited by Cgcre.
Figure 3. Number of proficiency testing schemes for testing laboratories according to fields of activity.

Figure 4. Number of proficiency testing schemes for calibration laboratories according to groups of calibration service.
3.3. Comparing the offering and needs of proficiency testing schemes
Reviewing the scopes of accreditation of different proficiency testing providers it was possible to identify accredited proficiency testing schemes for 7 (44%) of the 16 fields of activities, while 5 (45%) of the 11 groups of calibration services with accredited calibration schemes. Adding to the possible extensions of accreditation scopes, these values increase to 9 (56%) and 9 (86%), respectively.

3.4. Comparing the offering and needs of proficiency testing schemes
The laboratories that intend to obtain accreditation shall demonstrate their competence to perform tests and calibrations for which they seek accreditation, through satisfactory participation in proficiency testing activities. The standard NIT-DICLA-026 details the requirements for participating in proficiency testing activities. Cgcre provides information regarding proficiency testing schemes available in Brazil and abroad, in addition to documents and webpages on the matter. Cgcre established in its policy criteria for selection of PT providers [9], which in addition to the programs offered by accredited providers, accepts, for example, proficiency testing schemes offered by:

- Cgcre by itself through its Metrological Reliability Sector of Diclal (Secme) or its technical advisory committees. These specific sector organizes proficiency testing programs (measurement audits\(^2\)) to 8 (73 %) of the 11 groups of calibration services;
- INMETRO - the National Metrology Institute;
- Proficiency testing providers registered in the International Database of Proficiency Testing Schemes (EPTIS), www.eptis.bam.de. In April 2013, there were 125 Brazilian PT schemes registered in this specific database and 9 (75 %) of the 12 PT providers accredited by Cgcre have registered schemes in EPTIS.

In case the laboratory proves that there are no proficiency testing scheme available and if the laboratory does not have access to interlaboratory comparisons mentioned in Cgcre’s policy, the laboratory can demonstrate its competence by satisfactorily participating in an interlaboratory comparison whose purpose is to compare the results of two or more laboratories, organized by itself [9].

4. Conclusion
The pilot program established by Cgcre and the review of the accreditation process of proficiency testing providers adopted showed to be effective, considering that the pilot project resulted in the accreditation of the first providers in Brazil and in the dissemination of the accreditation process to assessors and Cgcre’s staff. The results demonstrate that these proficiency testing providers have provision a significant portion of the fields of activity and groups of calibration services, representing the needs of testing and calibration laboratories accredited by Cgcre. However, there are gaps in the provision of proficiency testing schemes, for example, 7 (44 %) of the fields of activity are not supplied by accredited proficiency testing schemes and also no perspective to the extension of accreditation scope in the short term by accredited PT providers.

The results obtained allow Cgcre to establish preview of the possible scope of accreditation by PT providers to gauge the needs of its process, for example, prospecting and/or training of assessors/experts in the different fields detected. In addition, the data obtained in this work still informs proficiency testing providers or other interested organizations to potential areas where there are needs for the development of proficiency testing schemes.

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\(^2\) Measurement audits are interlaboratory comparisons organized by Secme, used by the assessment team to assess the technical competence of laboratories to perform calibrations, including internal calibrations.
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