

APMP Member Report 2021

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Government Laboratory, Hong Kong (GLHK), China

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Please submit this report to APMP-Secretariat@nim.ac.cn no later than 14 November 2021.

Section 1: General Management

(a) Statutory functions and scope of service GLHK is entrusted with a statutory role to provide analytical and advisory services to government departments to support the enforcement of regulations and to implement the government policies related to public health and safety, environmental protection, protection of government revenue and criminal justice in Hong Kong, China.

GLHK is equipped with an array of state-of-the-art equipment and provides comprehensive analytical services pertaining to food, pharmaceutical products, Chinese medicine, dangerous goods, environmental protection and consumer products for the protection of public health and safety, and the environment. GLHK also provides comprehensive forensic scientific services to the Criminal Justice System in Hong Kong, China, covering questioned documents, toxicology and controlled drugs examination, as well as chemical, biochemical, and physical examination of evidence.

(b) Metrology

GLHK is a Designated Institute in the field of metrology in chemistry for Hong Kong, China under the Mutual Recognition Arrangement of International Committee for Weights and Measures (CIPM MRA), and has the responsibility for

- (i) promoting the awareness of metrology in chemistry and biology;
- (ii) ensuring that measurement standards maintained are traceable to the International System of Units (SI):
 1. via a primary realization or representation of the unit of measurement concerned;
 2. via another National Metrology Institute (NMI) or Designated Institute (DI) having relevant Calibration and Measurement Capabilities (CMCs) with appropriate uncertainty published in the Key Comparison Database (KCDB) or through calibration and

measurement services offered by the International Bureau of Weights and Measures (BIPM).

(iii) dissemination of traceability of measurement to field laboratories.

(c) Quality management system

The quality management system of GLHK complies with requirements of relevant international standards. GLHK has become the first accredited laboratory in Hong Kong, China since 1985, and the current quality system conforms to the ISO/IEC 17025:2017. In 2011, GLHK was also the first laboratory acquired accreditation in the Forensic testing category in Hong Kong, China. Further, GLHK was accredited as the proficiency testing provider (ISO/IEC 17043) and reference material producer (ISO 17034) since 2009 and 2010 respectively.

(d) Staff situation and training

GLHK has established a Chemical Measurement and Development Committee (CMDC) to focus on different Metrology in Chemistry (MiC) Activities. The committee is reinforced by different working group with the support from the Strategic Development (SD) Section to disseminate diversify metrology activities, including organisation of PT schemes , production of reference materials, and providing technical seminars for local testing laboratories. The CMDC is also charged with a duty to arrange training for the staff members who are involved in new metrological activities whenever appropriate.

(e) Internation and Local Cooperations

In November 2004, GLHK became a full member of the APMP. GLHK has been included as a Designated Institute, in the field of metrology in chemistry for Hong Kong, China, under the CIPM MRA since May 2005. The observer membership of GLHK in the Consultative Committee for Amount of Substance: Metrology in Chemistry and Biology (CCQM) has been approved by CIPM in 2012. GLHK has joined the APMP Food Safety Focus Group (FSFG) as a member since May 2015. As a considerable part of its services is related to food safety monitoring work, GLHK placed significant emphasis on the development work on this specific area over the years. For instance, GLHK organised and participated in a number of CCQM/APMP international comparisons related to food safety testing. Also, GLHK organised a number of international symposiums with theme on food safety to promote the importance of metrology to this area. GLHK expects more technical exchange and experience sharing with other NMIs or DIs through the coming activities of the APMP FSFG especially for topics of interest common to the economies in the region.

(i) Joint Proficiency testing programmes

GLHK has organized a PT programme related to food safety under the auspices of the Joint Proficiency Testing Working Group (PTWG) formed between APMP and Asia Pacific Accreditation Coordination (APAC) in 2021: *APLAC T113 "Benzoic Acid in Fish Sauce"*. Invitations for nomination and participation were sent to various laboratories in Aug 2021. 41 laboratories from APAC and APMP DEC have registered for APAC T113. Distribution of samples are in progress, and is expected to be complete within early-Nov 2021. Sample receipt form was sent out to all the participants for their acknowledgment of the receipt of the sample. Deadline for results submission of APAC T113 is scheduled on 28 Feb 2022

The organization of an APMP supplementary comparison, APMP.QM-S19 "Toxic Elements in Seafood" is in progress. Invitation for participation was circulated to member institutes of APMP Technical Committee for Amount of Substance (TCQM) and CCQM IAWG members in mid. 2021. In total, nineteen (19) NMIs/DIs from the RMOs including APMP (8), AFRIMETS (1), EURAMET (4), and SIM (5), and one international organization (IAEA) have registered for the programme.

(ii) Metrology workshop about food safety

During May to Jun 2021, a workshop cum training (via on-line video mode) on "Toxic Inorganic Elements in Seafood" under the auspices of APMP FSFG was jointly coordinated by National Institute of Metrology (Thailand) (NIMT), National Metrology Institute of Malaysia (NMIM), the Health Sciences Authority (Singapore) (HSA) and GLHK. GLHK was mainly responsible for the technical sharing through the holding of several training sessions and the provision of the post-training practice sample. Post-training practice samples were dispatched to participants in Jun 2021. The deadline for results submission is rescheduled on 30 Nov 2021. Dr. Della Sin, Head of GLHK, has been invited to present in the APAC PTP & RMP Accreditation Workshop on 12 May 2021.

(iii) Local metrology symposium and workshop

On 28 May 2021, GLHK collaborated with Standards & Calibration Laboratory (SCL) of Innovation and Technology Commission (ITC), Hong Kong Council for Testing and Certification (HKCTC), and the Open University of Hong Kong (OUHK) to organise the Metrology Symposium 2021 under the theme: "Metrology Around Us". This event aimed to share how metrology plays its role around our daily life and introduced the recent development in the transformation of the SI to the digital world led by the International Committee for Weights and Measures (CIPM). Representative of GLHK gave a presentation on "Chemical Metrology - Supporting the Quality of Life."

GLHK has also co-organized with SCL to run the Metrology Workshop 2021 on 23-24, 27 Sep 2021 via online webinar. The focus of this workshop was to introduce the principles and techniques in various measurement fields. The workshop has attracted more than 200 participants from local testing industry and tertiary institutes. GLHK has given a presentation on “Establishing the traceability in chemical measurement” and the feedback from participants was appreciated.

Section 2: Technical Highlights

(a) 4th Peer Review for GLHK

The GLHK has been appointed by the government of the HKSAR as a Designated Institute for Metrology in Chemistry since 2005. The first on-site peer review was carried out during the period December 2008, the second one in December 2011 and the third one in September 2016. The activities of the GLHK with respect to the quality management, production and certification of CRMs and the organization of Proficiency Testing (PT) schemes have also been accredited by the Hong Kong Accreditation Service (HKAS) according to the requirements of ISO/IEC 17025:2017, ISO 17034:2016 and ISO/IEC 17043:2010 respectively.

The GLHK planned to carry its fourth peer review through attestation by a team consisting of quality system experts and technical peers in mid-2021. However, due to travel restrictions caused by the COVID-19 pandemic, it was not possible to invite experts from other economies. The GLHK followed the recommendations published in “APMP Guidelines for On-site Peer Reviews/Assessments under Unexpected Circumstance due to COVID-19”. The on-site technical review was postponed, which will be resumed within six months after the pandemic is over. The action was notified and approved by the Chair of APMP Technical Committee for Amount of Substance (TCQM). In addition, approval was sought from the Chair of APMP Technical Committee for Quality System (TCQS) on assigning Dr. Sang-Ryoul Park, President of Consultative Committee for Amount of Substance: Metrology in Chemistry and Biology (CCQM) and former President of KRISS, as a quality management system expert to assess the management aspects of GLHK.

Section 3: CIPM MRA Related Matters

(a) Participation in and organisation of international comparisons

To ensure equivalence of measurements with other metrology institutes, GLHK has actively participated in international comparisons and studies especially those related to food, health, environment and product safety. In 2020/2021, GLHK has participated in four(4) key comparisons organised under the auspices of the Consultative Committee on Amount of Substance: Metrology in Chemistry and Biology (CCQM) and one(1) supplementary comparison organised by APMP, namely CCQM-K168 “Trans-zearalenone in Maize”, CCQM-K86.d/P113.5 “DNA ratio in a High Protein Matrix: Relative Quantification and Fractional Abundance of Genomic DNA Extracted from a Biological Tissue”, CCQM-K158 “Elements and Inorganic Arsenic in Rice Flour”, CCQM.K161 “Anions in Seawater” and APMP.QM-S19: “Toxic Elements in Seafood”.

GLHK together with the national metrology institute of Turkey of UME coorganized a CCQM key comparison cum pilot study: CCQM-K155/P196 “Elements and tributyltin in seawater” under the auspices of CCQM IAWG. Results were sent to participants on 29 Oct 2020. Participants’ results were presented and discussed at CCQM IAWG Web-Meeting on 3 Nov 2020. The Draft A report is being prepared.

The organisation of a CCQM pilot study: CCQM-P215 “Arsenic Speciation in Seafood” was supported by CCQM IAWG. The latest progress was presented at the CCQM IAWG Web-meeting on 6 May 2021. A questionnaire was distributed in July to collect views from NMIs/DIs for their interest in participation. Six institutes, HSA of Singapore, METAS of Switzerland, NIMT of Thailand, NMISA of South Africa, NRC of Canada and VNIIM-UNIIM of Russian Federation) returned the questionnaire and indicated their interest. Homogeneity and short-term stability studies are in progress. The progress update will be presented at the CCQM IAWG meeting on 10 Nov 2021.

(b) Calibration and measurement capabilities

As of August 2021, GLHK has 105 CMCs claims published in the BIPM KCDB, covering 10 measurement service categories (i.e. high purity chemicals, inorganic solutions, water, pH, polymers & plastics, biological fluids & materials, food, fuels, sediments & soils, and other materials). Ten CMCs submissions, including four under Category 1 – High purity chemicals, four under Category 9 – Advanced Materials and two under Category 11 – Food, were approved in Cycle XXII on the new KCDB 2.0 platform.

Section 4: Future plans

GLHK will continue to take part in international activities on metrology in chemistry and biology. In particular, food analysis, environmental analysis, nucleic acid analysis and proteomics analysis are the areas that GLHK would further develop in the coming years. This is to underpin the related measurement services and technical support to be provided to the clients.

A cross-RMO collaboration comprising a proposed SIM Supplementary Comparison Study, a proposed APMP Pilot Study and parallel-run PT(s): “Trace Elements in Natural Mineral Water” is planned for 2022. This project is intended to build the laboratory capabilities in Asia Pacific economies in measurement of water quality. The coordinating laboratories for the SC are NRC of Canada, NMIA of Australia and GLHK. An Asia-Pacific Economic Cooperation (APEC) Project Proposal (co-sponsoring economies: Australia, Canada; China; Singapore and Hong Kong, China) was also submitted to seek for the support for capabilities building activities including a pre-measurement and a post-measurement workshop for the participating NMIs/DIs shortly before and after the afore-mentioned technical work.