

Strategic Goal #1: To Provide Traceable Calibration Services

Metrology influences, drives and underpins much of what we do and experience in our everyday lives. Industry and trade, quality of life, science and innovation all rely on stable, comparable, sound measurements. This can only be achieved by having in place a framework to demonstrate and ensure traceable measurements. **Traceability is the property of a measurement result whereby the result can be related to a reference through a documented unbroken chain of calibrations, each contributing to the measurement uncertainty¹.** This simply means that traceability provides confidence and assurance in measurement results.

Being the legal custodian of the national measurement infrastructure, the Belize Bureau of Standards (BBS) seeks to establish metrological traceability as a tool to support competitiveness of goods and services as well as meet its mandate of protecting both consumers and producers. This will be accomplished by linking the measurement system of Belize to the International System of Units (SI Units) through the provision/facilitation of calibration and other measurement-related services.

Along with its state-of-the-art metrology facility that is equipped with instrumentation to provide calibration services in the magnitudes of mass, dimension (length), volume, pressure, and temperature, the BBS' goal of attaining and maintaining metrological traceability will be achieved by:

- Dynamic development of the metrology laboratories to provide relevant services that constantly meet the needs of stakeholders
- Building the competence of the metrology staff to ensure reliable measurements by establishing and maintaining a quality management system that meets the requirements for ISO/IEC 17025:2017
- Maintaining measuring standards and equipment in a calibrated state
- Establishing and maintaining good rapport with regional metrology institutes for referral of services
- Sensitization of stakeholders of the importance of traceability

Having a traceable measurement infrastructure at the national level:

- Facilitates the dissemination of the SI units countrywide
- Reduces the need to seek calibration and measurement services abroad, therein boosting the Belizean economy
- Promotes the improvement of quality in products and services especially for Micro Small and Medium Enterprises (MSMEs) by offering reduced costs for calibration and measurement services
- Encourages and attracts investments
- Reduces technical barriers to trade
- Supports the sustainability of the metrology laboratories of the BBS

The provision of traceable calibration services provides the technical infrastructure which makes it possible to obtain accurate and reliable measurements which are fit for purpose and which are accepted worldwide.

¹ International Vocabulary of Metrology (VIM) – 3rd Edition, JCGM 2012

	IMU QUALITY POLICY AND OBJECTIVES			
	Page 1 of 1	Document Number: BBS-AWP-1.0	Issue date:	
	Revision Number: 00	Approved By: Director	Last Revised:	

Policy	Objective	INDICATOR(S)	TIMELINESS	RESPONSIBILITY	GOAL
The provision of calibration services is just one aspect of the essential work carried out by the Belize Bureau of Standards (BBS). The design, implementation, and performance of this service focus on quality, integrity, impartiality, confidentiality, reliability, and customer satisfaction. The BBS endeavors to achieve the highest level of client confidence by continuously assessing and enhancing the competency of its staff and equipment; it strives to be unbiased at all times and to treat with confidentiality all information, both of the client and the institution itself, that is obtained through interaction or execution of its services. Further to this, the goal of the BBS is to provide calibration services of the highest standard as per ISO/IEC 17025 that meet the needs of stakeholders while seeking continuous improvement to anticipate the future needs of the nation as the BBS cements its role firmly within the quality infrastructure framework of Belize.	1. To establish and maintain national and international recognition of the Fine Mass laboratory through 100% compatibility with ISO/IEC 17025 and ISO 9001 standards by end of 2024	Expansion of ISO 9001 scope to include calibration services	Dec-23	MO1	Certification to ISO 9001 to include calibration services
		Accreditation of metrology laboratories	Mar-24		Fine Mass Lab accredited to ISO/IEC 17025
		Internal Audit Report	Yearly	QR	Assess QMS to identify OFI, NC, compliance
		External Audit Report	Yearly	QR	
		Calibration Certificates	As per BBS calibration interval document	MO1	Traceability to SI
	2. To achieve 95% customer satisfaction in the provision of sound and substantive measurement results by assessing service performance bi-annually	Satisfaction surveys & report	Bi-annually	SO	Assess performance and customer satisfaction to identify areas for improvement
	3. To continuously improve the processes of the lab QMS by determining clients needs and expectations every 5 years.	Metrology demand Survey & Report	By August 2024 (every 5 years)	CPLO/CPEO/MO1	Analysis of stakeholder needs to guide development of the BBS
		Scope of calibration services	Continuous	MO1	Competent staff and QMS to expand scope of calibration services
		Updated QMS documents	Continuous	MO1	
		Training	Continuous	MO1	
	4. To continously foster a culture for quality amongst interested parties by continuously advocating the importance metrology by hosting a metrology-related event every quarter.	Stakeholder engagements	1 engaement quarterly	CPLO/CPEO/IMU	Realized emphasis on the importance of metrology and relevance of BBS as Belize's NMI

Annual Work Plan (Industrial Metrology Unit - 2024 - 2025)

No.	Objectives	Activities/ Task(s)	Output(s)/Outcome(s)	Baseline	Targets	Coverage	Timeline (Fiscal Year - FY 2024/2025)												Status	Comments
							Quarter I			Quarter II			Quarter III			Quarter IV				
							Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar		
1	Provision of Traceable Calibration Services																			
1.1	Maintain traceability of measuring standards to the International System of Units (for existing calibration services)	- Calibration of Comparators - Calibration of F ₁ Mass Standards - Calibration of M ₁ Mass Standards - Calibration of Volumetric Test Measure	- Calibration certificates with updated, traceable measurement results - Heightened confidence in calibration results	- 2 NAWI(Volume) - 101 pieces of F1 Mass standards (~182 kg) - 44 pieces of M1 Mass Standards (~1,000 kg)	- 2 NAWI(Volume) - 101 pieces of F1 Mass standards (~182 kg) - 44 pieces of M1 Mass Standards (~1,000 kg) - 2 SPRT (Temperature) - 2 Volumetric Test Measures			X	X	X							X	X	X	
1.2	Meet stakeholder calibration needs as it relates to Mass, NAWI, Volume Calibrations	- calibration of mass standards from 1 mg to 500 kg - Calibration of non-automatic weighing instruments (class II, III, IIII) - Gravimetric calibration of volumetric test measures from 10 ml to 18.9271 L (5 gallons)	- increased number of calibrated standards and measuring instruments across sectors - Support stakeholders seeking improved QMS or meeting QMS requirements - Support stakeholders with confident measurement results	46 External Calibrations - 6 NAWI - 10 Grand Mass - 30 Fine Mass	61 External Calibrations - 6 NAWI - 15 Grand Mass - 40 Fine Mass			X	X	X	X	X	X	X	X	X	X	X	X	32% increase.
1.3	Develop and Maintain Laboratory Quality Management System capable of supporting measurement assurance	Perform Mass Inter-laboratory comparison	- Demonstrated competence to performed calibration of mass standards - Accreditation of Fine Mass Laboratory	none	Fine Mass Laboratory (1 mg to 10 kg)				X	X										This activity is being funded by the 11th EDF. Funds will have to be identified for this activity yearly activity
1.4	Assess national stakeholder needs as it relates to calibration	Conduct nation-wide survey of measuring standards and instruments	Revised data on inventory/stock of measuring devices across magnitudes and identification of stakeholder calibration needs	Data collected in 2011 survey	- Construction - Food Processing - Non-Medical Laboratories - Health				X	X	X									
2	Sensitization of Stakeholders																			
2.1	Support public awareness for the importance and role of metrology in industry, trade and everyday life	- Metrology Sensitization Sessions - commemoration of WMD	- Improved public and stakeholder awareness on the importance and role of metrology and QI	- ISO/IEC 17025 Sensitization Session - Introduction to Metrology Session - Best Measurement Practice I - Best Measurement Practice II	- Introduction to Metrology - Best Measurement Practice Uncertainty I - Calibration vs Verification - Introduction to ISO/IEC 17025 - WMD activity (sustainability)			X	X		X	X		X	X			X		- Calibration vs. Verification (April) - DMG - Introduction to Metrology (October) - CDJ - Uncertainty I (July) - EPC Uncertainty II (August) - EPC - Introduction to 17025 (November; February) - DAG
3	Development of Temperature Calibration Laboratory																			
3.1	Enhance the institutional capabilities of the BBS through the operationalization of the temperature laboratory	- Development of technical documents - Calibration of SPRT - Perform mock calibration of LiG	- Enhanced Capacity of the BBS to provide traceable calibration of temperature measuring devices - Inclusion of Temperature Calibration in QMS	NONE	- Development of technical procedures/WI/guidelines for: 1. Ice point preparation 2. Use of water baths 3. Calibration of LiG thermometers 4. Calibration of digital thermometer - Calibration of SPRT - Procurement of Dry Well - Development of uncertainty budget - 5 calibrations of LiG thermometers performed			X	X	X	X	X	X	X	X	X	X	X		Operationalization depends of the availability of financial resources to procure equipment and calibrate standards

Status:	Note(s):
C- Completed	Progressing well/ done
I - In Progress	In development
P - Pending	Take action/ past due

			Quarterly Work Plan (Industrial Metrology Unit: July 2024 - September 2024)								
		Page 1 of 1	Document Number: BBS-QWP-1.0				Issue date: 06/04/2015				
		Revision Number: 00	Approved By: Director				Last Revised: 15/04/2015				
Strategic Goal	Objective	Activities/ Task(s)	Output(s)/Outcome(s)	Target(s)	Coverage	Responsibility	FY 24/25 Quarter 2 (Jul - Sept 2024)			Status	Comments
							July	August	September		
Provision of Traceable Calibration Services	Maintain traceability of measuring standards to the International System of Units (for existing calibration services)	- Calibration of Balances - Calibration of F1 Mass Standards - Calibration of M1 Mass Standards - Perform ILC - Assessment of FM Lab	- uncertainty budget with updated, traceable measurement results - Heightened confidence in calibration results - Accreditation of FM Lab	1 NAWI (Volume lab)	100%	Cheryl Jones	-	X	-	P	This was not compelted because of Volume AC not working
				20 out of 44 pieces of M1 Mass Standards	100%	Dony Gonzalez & Cheryl Jones	-	-	X	P	
				1 Mass ILC	100%	D. Guerra	X			C	
				Calibration small volume volumetric test measure	100%	Cheryl Jones	5	5	5	P	This was not compelted because of Volume AC not working
				Assessment of FM lab	100%	D. Guerra	assessment	closing of any non-conformity	closing of any non-conformity	I	It is likely that a non-conformity will be issued until the ILC is completed.
				Training of IMU staff in ISO/IEC 17025	100%	IMU Staff	X	X		C	training provided by CIQ under CDB-SF
Sensitization of Stakeholders	Support public awareness for the importance and role of metrology in industry, trade and everyday life	Metrology Sensitization Sessions	- Improved public and stakeholder awareness on the importance and role of metrology and QI	Uncertainty I	100%	E. Castañeda	-	X		P	This was not compelted because of heavy work load related to accreditation of the FM lab
				Uncertainty II	100%	E. Castañeda			X	P	
		Metrology Demand Survey		Mass, Volume, NAWI, Temperature, Pressure and Dimensional Calibrations	100%	IMU Staff	-	-	X	P	This was not compelted because of heavy work load related to accreditation of the FM lab
Development of Temperature Calibration Laboratory	Enhance the institutional capabilities of the BBS through the operationalization of the temperature laboratory	- Characterization of water baths - Develop uncertainty budget - Perform mock calibration of LiG	- Enhanced Capacity of the BBS to provide traceable calibration of temperature measuring devices - draft uncertainty budget - Establishment of QMS for Temperature Laboratory	Cleaning of Water Baths	100%	Cheryl Jones Dony Gonzalez	X	-		C	
				Characterization of Water Bath	100%	Cheryl Jones Dony Gonzalez	X			i	This may include development of a WI or GU to outline how this is done
				Development of preliminary uncertainty budget	100%	E. Castañeda		X		i	This will also include training on the use of the uncertainty budget and necessary updates for a draft uncertainty budget.
				Mock Calibrations	100%	Cheryl Jones Dony Gonzalez			at least 6 mock calibration	P	The BBS will reach out to the University of Belize for their participation in this mock trial.
Status:		Note(s):		Approved By (Name): <u>Samantha Banner, Ag Director</u> Signature: _____ Date (DD/MM/YR): _____							
Completed - C		Progressing well/ done									
In Progress - I		In development									
Pending - P		Take action/ past due									

