

Laboratory/Country Report

TEMPLATE

National Metrology Center (NMC)
The Kingdom of Cambodia
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Section 1. General Status

A. Introduction of Country



Flag



Royal arms



- [Capital City : Phnom Penh](#)
- [Official languages: Khmer](#)
- [Religion: Buddhism \(official\)](#)
- [Population: 14.86 million \(World Bank,2012\)](#)
- [Area: 181035 sq km](#)
- [Climate: tropical humid \(monsoon\)](#)
- [Border countries: Laos, Thailand, Vietnam](#)
- [Currency: Riel](#)
- [Major Exports: Garments, Fisheries Products, Rubber and other Agricultural products](#)
- [Main Sectors: Agriculture, Industry, Service, Tourism](#)

A. Cambodia – Country context

Agriculture has long been the most important sector to the Cambodian economy, with around 59% of the population relying on agriculture for their livelihood (with rice being the principal crop). Other important sectors include garments, construction and tourism. From 2004 to 2007, the economy grew about 10% per year, driven largely by an expansion in the garment sector, construction, agriculture, and tourism. GDP dropped to below 7% growth in 2008 and probably contracted in 2009 as a result of the global economic slowdown.

With the January 2005 expiration of a WTO Agreement on Textiles and Clothing, Cambodian textile producers were forced to compete directly with lower-priced countries such as China, India, Vietnam, and Bangladesh. The garment industry currently employs more than 280,000 people, which is about one third of the work force and contributes more than 70% of Cambodia's exports. The garment industry therefore is considered the most important with

development results witnessed by rapid growth which has contributed a considerable share of total export earnings and created a large number of jobs for the Cambodian workforce. Other than this sector, the commodities that are exported at present are timber, rice, fish, rubber, tobacco and footwear.

B. INTRODUCTION OF INSTITUTE

1) BRIEF HISTORY OF NMC

- NMC was established under Metrology law, approved by Royal Decree No 0809/016 dated August 11, 2009, and was founded on 22nd April 2011 by sub-decree as governmental organization for managing all activities and services related to metrology such as scientific metrology, Industrial metrology and Legal metrology. NMC operates under supervision of the Ministry of Industry & Handicraft, having the level of a General Department and has its own specific stamp. Its main objective is to determine the mechanism and rules of the management of metrology within the Kingdom of Cambodia.
- All metrological works of NMC are stipulated by the Metrology law of Cambodia and shall cover the implementation of manufacturing, importation, installation, use, repairs, maintenance and the exposure for sale of metrology instruments, product goods, pre-packaged goods within the Kingdom of Cambodia.
- NMC is Cambodia's only peak measurement facility and is tasked with developing measurement standards and methods for the benefit of growth, employment, equity and efficiency. NMC fills a role that is important in promoting social justice and the rule of law, as well as supporting industry, SMEs, trade, society and science.
- NMC is a member of International Organization of Legal Metrology (OIML) ,(APLMF), (APMP), Asian Consultative Committee on Standards and Quality (ACCSQ), and ASEAN Expert Group on Metrology (ASEAN EGM)
- Recently NMC has 75 staff who work in different areas of metrology such as scientific, industrial, and legal metrology, and some work as administrators .NMC has five Laboratories which are in progress such as Mass, Thermometry, Volume ,Temperature and Humanity and Length

2) MISSION AND FUNCTION OF NMC

1. Vision

- ✓ To improve metrology to be a core component in the development of industry, services, science, and technology and to form the basis of economic growth.

2. Mission

- ✓ To promote Cambodian innovation and industrial competitiveness by advancing measurement science, standards and technology in ways that enhance economic security and improve our quality of life.

- ✓ To enhance the accurate measurements in industry in accordance with an internationally recognized measurement infrastructure.
- ✓ To actively participate in metrology community in region and international through international meeting, seminar, workshop, and technical trainings.

3. FUNCTIONS AND DUTIES

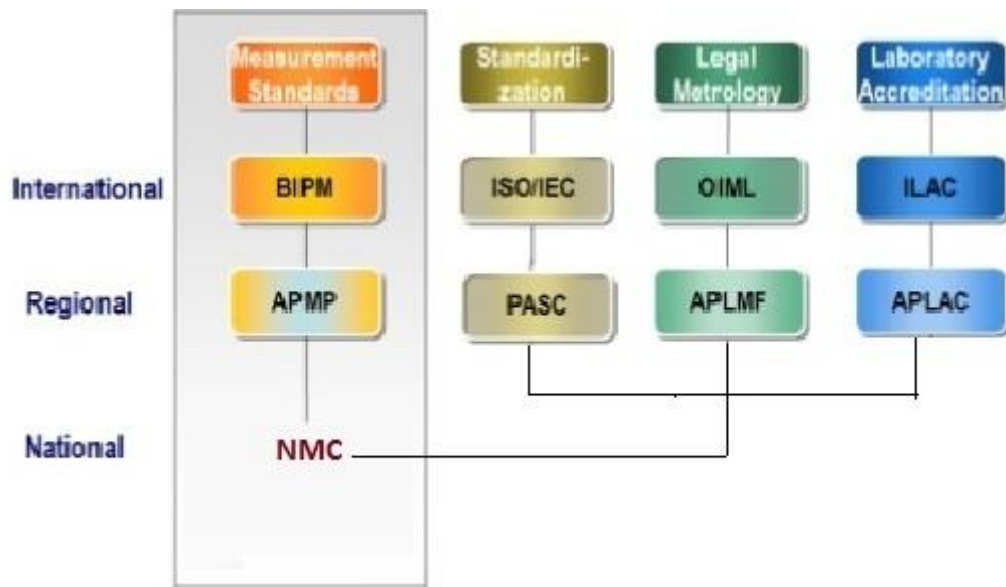
- To organize and implement the strategic policies and development plans of metrology; to implement metrology registration; to conduct study research and develop scientific technology of metrology; to manage and maintain national standard, secondary standard and working standard.
- To do inspection on conformity assessment and issue the certificate of recognized working standards for applying in other entities.
- To calibrate metrology standards and metrology equipment
- To test, analysis and specify pattern approval of metrology equipment, producing goods, templates and package
- To inspect pre-packaged goods in detail condition of pre-packaged goods that related to metrology.
- To do verification and declare minimum and maximum of capacity weight and measurements of metrology equipment that permit to use or occupy in commerce activities and other sectors in accordance with national system of legal units of metrology.
- To facilitate and manage creation and use of national system of legal units of metrology, and other system of legal units of metrology in Cambodia.
- To issue License for manufacturing and repairing metrological instruments and license of using Cambodian metrology trademark in accordance with metrology law and the existing provision.
- To organize legal document, administrative procedure and technology to strengthen effectiveness of metrology works.
- To build up capacities on human resource, technology development, information technology, and implement the assessment of personnel capacities and other institutions related to metrology

- To collaborate with national and international agencies to develop and harmonize metrology infrastructure in Cambodia.
- To seek help from development partner countries in order to develop metrological infrastructure and capabilities
- To cooperate with partner ministries/institution to inspect the violation in the process of manufacture, repair, use and business related to metrology equipment.
- To manage and carry out on process of collection service fee, penalty and other fees followed by the law.
- To undertake other tasks delegated by Minister.

3) Laws/Acts concerning the establishment and operation of NMC

- To assure a good and fair trade
- To create the correct use of metrological instruments
- To assure the best interest of suppliers and users of products, goods, and services
- To assure the improvement of the quality of goods, products, services and management.
- To determine the identification and removal of Technical Barriers to trade and harmonization of trade transactions within the framework of legal metrology.
- To create a credible environment for the use of metrological instruments in trade activities and other businesses in health, security and environment.
- To facilitate the development of science and technique for economic development
- Establishment and Improvement of National Measurement Standards
- Research and development of Standards and Metrology
- Dissemination of National Measurement Standards

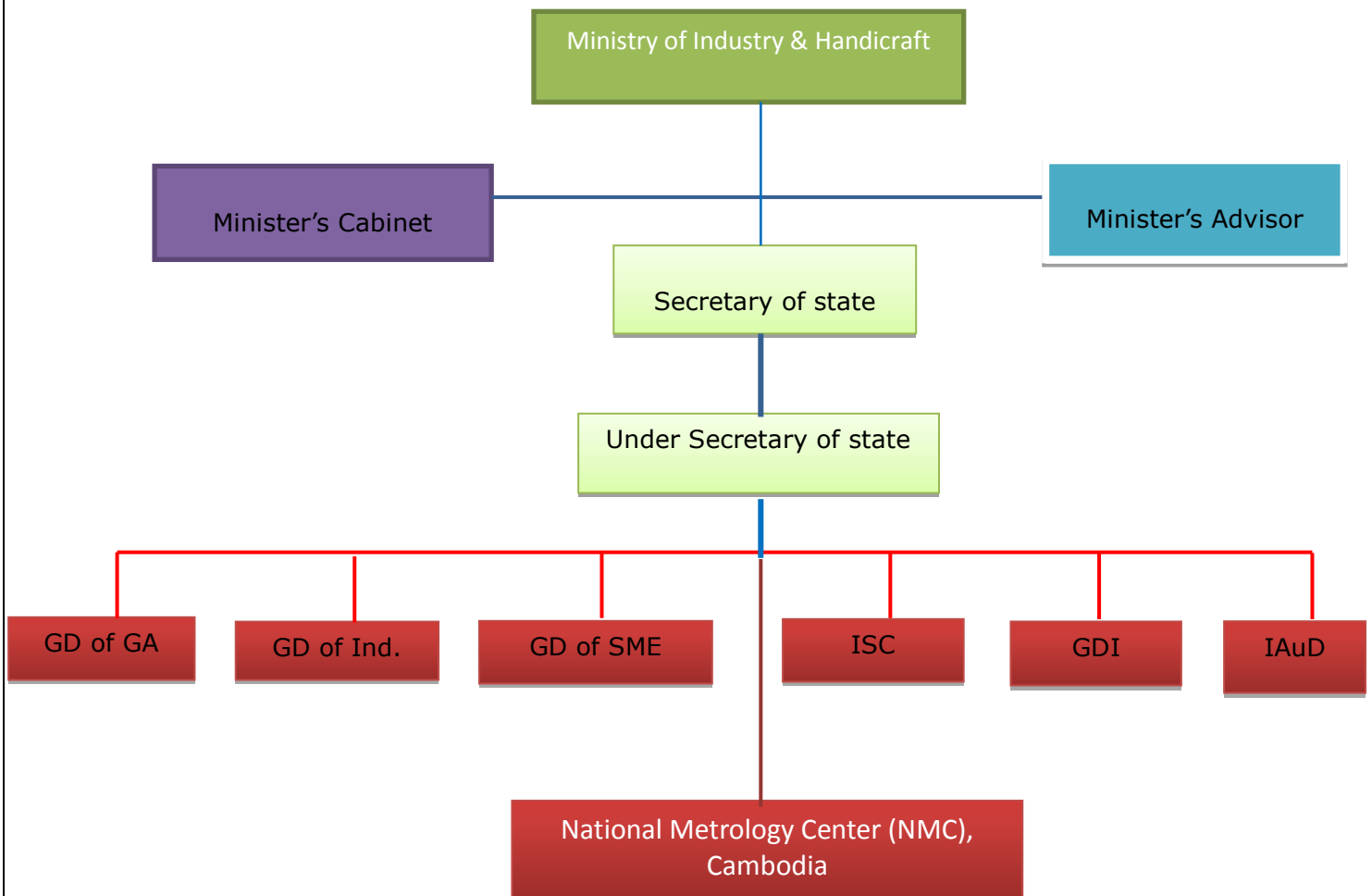
4) National Standards System (If any)



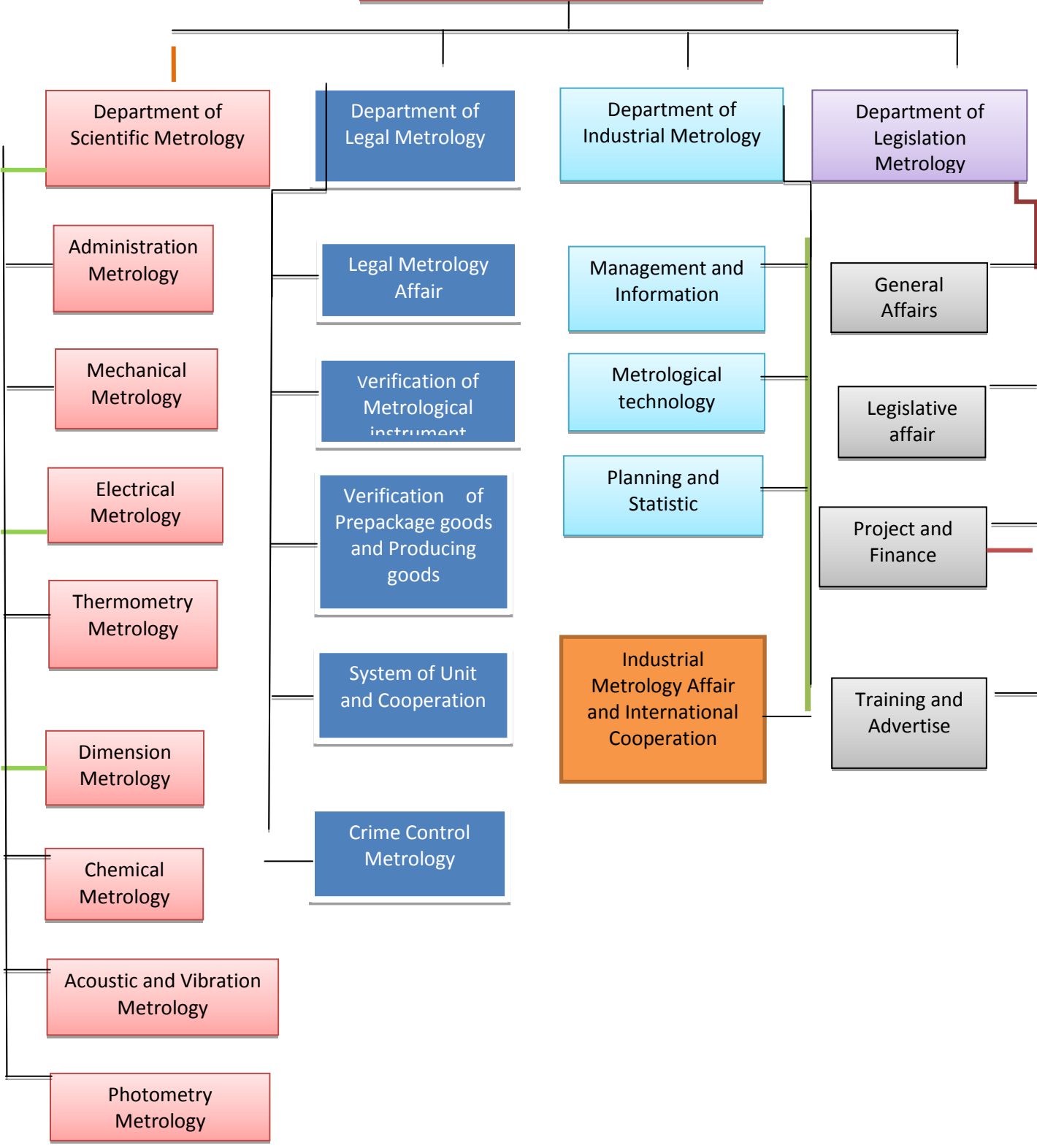
➤ The national standards system of Cambodia comprise of following standards:

- National Primary Standard (Royal Decree)
- Secondary Standard (Issued by the Minister)
- Working Standard (Recognized by president of NMC)

5) Organizational structure



National Metrology Center (NMC), Cambodia



The abbreviation

GD of GA = General Department of General Affairs
GD of Ind.= General Department of Industry
GD of SME= General Department of Small Medium Size Enterprise
ISC = Institute of Standards of Cambodia
NMC= National Metrology Center
GDI = General Department of Inspection
IAuD=Internal Audit Department

6) Personnel & Budget

National Metrology Center of Cambodia is the Governmental organization under supervision of Ministry of Industry and Handicraft. The NMC 's budget plan relies on budget plan of Ministry.

Total personnel in Ministry of Industry and Handicraft equivalent 493 person including personnel of NMC=77person.

NMC Personnel has 77 person including administrative staffs and technical staff. The staffs are following:

- Top management 1
- Scientific officers 11,
- Legal Metrology officers 34,
- Industrial Metrology officers 15
- Administrative officers 16.

The annual budget that NMC receives from ministry is to improve and develop the metrology including administrative, capacity building, Standards equipment, maintenance working standard and transportation.

7) Human resources available at our institute (in the fields of measurement and standards)

Area	Doctors	Masters	Bachelor& below	remarks
Mechanic (Mass, Pressure, Force, Volume)			04	
Temperature			03	
Dimension			03	
Electricity			01	
Administrative			02	

B. Main laboratory equipment (* in use for services)

Area	Name of Equipment	Specifications	Traceability	Remarks
Mass	E0	1kg	A star	2 pieces
	E1	1mg-1kg	DKD	
	E2	1mg-10kg	NIMT	
	F1,F2, M1,M2,M3	1mg-10kg	NMC	
	F2,M1,M2,M3	(5-500)kg	NMC	
Thermometry	Fix point (water)			2 Nos
	SPRT	model:5681	NIMT	2 pieces
	SPRT	model:5699	Hart scientific	2 pieces
	PRT, Thermocouple		NMC	
Dimension	Gauge block	Grade K	Mitutoyo	
	Gauge block	Grade 1	DKD	
Pressure	Pressure Balance	CPB5000	DKD	1 set
	Pressure Balance	CPB5000HP	DKD	1 set
Volumetric	Burette	25 ml	NMC	1 pieces
	Overflow pipettes	(10,50,100,200,500,1000 ml)	NMC	6 pieces
	Graduated cylinder	(25,50,100,250 and 500 ml)	NMC	5 pieces
	Reference standards of volume	(5 Liter)	VMI	1 Pieces
Electricity	N/A			

* Abbreviation

- PTB: Physikalisch-Technische Bundesanstalt
- DKD: Der Deutscher Kalibrierdienst
- A*Star Singapore
- NIMT: National Institute Metrology of Thailand

C. Activities of International Metrology Community

1) Representation to International Communities:

Area	International/Regional Organizations	Representing Institutes
Measurement Standards	BIPM, APMP	NMC
Legal Metrology	OIML, APLMF	NMC

Standardization	ISO, IEC	ISC
Conformity Assessment (Accreditation)	ILAC, APLAC	DA

- BIPM: International Bureau of Weights and Measures
- APMP: Asia-Pacific Metrology Programme
- APLMF: Asia-Pacific Legal Metrology Forum
- OIML: International Organization of Legal Metrology
- APLAC: Asia Pacific Laboratory Accreditation Cooperation
- ILAC: International Laboratory Accreditation Cooperation

* For the CIPM CC membership, please express it with O (yes) or X (no).

- CIPM International Committee for Weights and Measures
- CC: Consultative Committee
- MRA: Mutual Recognition Arrangement
- CMC: Calibration and Measurement Capabilities
- KC: Key Comparison

4) Certification of QMS and Accreditation of Measurement Services (for your laboratory)

QMS Certification	Certified by	Year of Certification/Accreditation
ISO 9001		
Accreditation of measurement services	Accreditation by	Areas (& Year) of Accreditation
ISO/IEC 17025		

Section 2. Analysis of Needs: service for your customer and problems

Section 2.1 Analysis of needs: service for your customer

A. The main customer for measurement services of National Metrology Center are following:

- Oil station, Electricity and water supplier
- Garment factories;
- Construction sector (Steel, cement etc);
- Food Production and Processing (Fish, confectionery, grains, seeds etc.)
- Manufacturers of Various Essential Commodities and consumer goods,

B. Kind of measurement services our institute is requested to offer for those industries

- Testing
- Type approval
- Calibration of metrological standards and equipment
- Verification of weights, volume, Dimension
- Advice on measurement equipment procurement and use

International Cooperation

Partnerships and collaborative relationships are a central feature of NMC's efforts to achieve greater results for implementing effective work through Country, based on its Core Commitments to be a key player advancing the quality infrastructure of Cambodia and to lead metrology in Cambodia to be internationally recognized. The factors which will enable such successful achievements in metrology are attributed especially to securing high-quality human resources, continuous updating of measuring equipment and establishing quality management system based on international standards, among many others. But this work seems to be complicated because we need both financial support and technical assistance, for instance, to increase competency of staff, support quality initiatives for SMEs or transfer international good practices. Therefore, National Metrology Center (NMC), Cambodia signed MoU with National Institute of Metrology China and Guangxi Bureau of Quality, and Technical Supervision to extend bilateral cooperation on metrology. Also, Ministry of Industry and Handicraft signed MoU with General Administration of Quality, Supervision, Inspection and Quarantine of the People's Republic of China on metrology. More importantly Project proposal of MIH to request PTB to make project in Cambodia on strengthening National Quality Infrastructure has been accepted and passed.

Strategy areas

- To do survey on the market demands, and determine the identification of metrological equipment which prioritized for developing industry.
- To Support and improve the capacity and competency in metrology assurance with regard to quantity, quality, safety, service, environment and management.
- To take practical actions to strengthen the implementation of metrology as a tool for promoting competitiveness;
- To strengthen the capacity of the National Metrology Centre in doing research and in preparing procedures for inspection, verification, calibration, and testing.
- To continue strengthening institutional framework and the capacity in managing metrology, which are the foundations of industrial activities. Additional efforts are dedicated to develop the appropriate regulatory framework and to get international recognition of key national institutions such as the National Metrology Center of Cambodia.

- To raise awareness of the importance of metrology in order to broaden and attract the interest of entrepreneurs
- To organize public forums and dialogues with private sectors on the public services of metrology;
- To enable the National Metrology to be internationally recognized standards (International Standard Organization(ISO)/International Electro-technical Commission (IEC 17025, ISO/IEC 17020);
- To extend international cooperation with developed NMIs in the region and global

Strategy Map

1. Customer perspective

- Improve the awareness of customers
- Institutional support
- Satisfaction responds to our services

2. Internal process perspective

- Develop national metrological policy
- Increase traceability system of measurement standards
- Modify metrology law in accordance with international good practice
- Regulatory measure for market demands/ needs and determine the identification of metrological equipment which is prioritized for developing metrology (scientific, industrial, and legal metrology)
- Regularly review the implementation of strategies and policy
- Develop technical regulation of legal metrology that is harmonised with international regulations
- Develop scope of verification/ calibration capability
- Increase quality assurance of verification/ calibration results

3. Learning and growth perspective

- International cooperation
- Internal training
- Participation in international training/ seminar/ workshop
- Improve high-quality human resources in metrology
- Continuous updating of measuring equipment and establishing quality management system based on international standards
- Increase high quality standards facilities

4. Financial perspective

- Increased support from government
- Increased the support from Bilateral partners
- Increased the support from International agencies project

Challenges

- NMC technicians have limited skills in calibration, testing, pattern approval, and verification.
- Lack of facilities (reference standard) to conduct the testing, calibration and verification.
- Lack of technical assistance (Experts)
- Limited budget for development.
- Lack of National Primary, Secondary and Working standards
- Lack of budget to procure the requirement standards,