

## **Report for DEC-MEDEA**

Economic development in Asia is characterized by the rapid growth of some economies and the emergence of new economic areas. Especially the less developed economies are confronted with the challenge to meet the increasing quality requirements of regional and global markets. At the same time, the pressure to harmonize their technical regulations with international standards is growing. For example, this is the case with the WTO agreements on technical barriers to trade (TBT). This trend underlines the need to establish an internationally recognized quality infrastructure (QI).

CSIR-NPL has established several calibration facilities under the Physico Mechanical Metrology Program comprising of Mass, Volume, Density, Viscosity, length & dimensions, Temperature & Humidity, Optical Radiation, Force, Torque, Hardness, Pressure, Vacuum, Ultrasonics, Acoustics and fluid flow. Similarly there are several metrology programmes established under the Electrical and Electronics metrology programme.

The Established facilities/ Primary Standards at CSIR-NPL are primarily meant for the realization of the particular scale and to disseminate the same to the user organizations across the country in order to maintain harmony in measurements, achieve global competence in the manufacturing of products meeting the requirement of TBT, to provide the training courses for personnel in the field and to participate in the inter-comparisons for reaffirming the measurement capabilities. Based on the primary standards established, we have 236 Calibration and Measurement Capabilities (CMCs) registered in the BIPM website and we have also participated in several international inter-comparisons of our standards.

### **New Additions**

A 5 kN Dead weight force machine having a measurement capability of  $\pm 0.008\%$  has been established, this is would also enable us to provide the traceability in the force measurement to our customers in this range.

A calibration facility for particulate matter PM2.5 cut off size is established and a wind tunnel system has been developed and services has been provided using them to our customers and stakeholders.

CSIR-NPL has started to install five indigenously designed & Developed mono-static SODAR system at Delhi - NCR. to determine the pollution loading capacity of the specific region by measuring the Ventilation coefficient.

Government of India has declared CSIR-NPL a certification body for monitoring and measuring the environmental parameters by act of parliament.

CSIR-NPL is going to establish a unique facility for calibrating solar cells with the help of PTB, Germany.

This year CSIR-NPL has chalked out 22 key comparison and of which some are completed and some are in progress.

Upgraded the water flow calibration facility

## **Training programs:**

We have organised the following training programmes on the CSIR-NPL campus and offered hands on experience to the participants from several organizations in the field of Mass, length, temperature, force, pressure, luminance, fluid flow, electrical parameters, optical parameters and quality system.

1. Training Programme on Electrical and Electronics Metrology 14-16 Nov., 2018
2. Training Programme on Mass, Volume, Density and Viscosity Metrology 28-30 Nov., 2018
3. Training Programme on Fluid Flow, Force and Pressure Metrology 11-13 Dec., 2018
4. Training Programme on Length & Dimension Metrology 14-15 Feb., 2019
5. Course on IS/ISO/IEC 17025:2017 21<sup>st</sup> to 24<sup>th</sup> May, 2019
6. Half Day Programme on Uncertainty in Measurement for NPL Staff 22<sup>nd</sup> August, 19
7. Training Programme on Mass, Volume, Density and Viscosity Metrology 28<sup>th</sup> to 30<sup>th</sup> August, 19
8. Training Programme on Fluid Flow, Pressure & Vacuum Metrology 4<sup>th</sup> to 6<sup>th</sup> September, 19
9. Training Programme on Pressure, Vacuum and Force Metrology 29 to 31 October, 2019

There is a cooperation programme on capacity development for SAARC countries between CSIR-NPL and PTB. Under this programme cooperation program, CSIR-NPL has provided the necessary on-site hands training to the NML-BSTI, Bangladesh staff members in the field of force metrology for equipping them to calibrate force proving instruments and Universal testing machines as per the ISO standards so that they can disseminate the measurements and provide the traceability to their customers. Also, under the same programme we provided training advice to establish an electrical metrology laboratory at National Bureau of Standards and Metrology (NBSM), Nepal.

## **Future plan**

To establish a robotic mass comparator

We would like to establish force calibration facility in the range of 5MN to provide the necessary service to the industries. Also, we would like to improve our measurement capabilities in the 200kN force range by establishing a better machine.

We are planning to establish a Rockwell hardness machine.

We have plans to establish Charpy impact Testing facility to provide the necessary support to our stakeholders.

To establish optical interferometer manometer.

To establish Kibble balance, a project proposal is submitted to Govt. of India for funding.

For realization of Boltzmann constant through Acoustic Gas Thermometry, microwave cavity has been designed, dimensional measurements performed, acoustic evaluation would be initiated.

A facility for standard E-Field generation and precise measurement has been established. It is also capable of measuring conducted and radiated RF intensity. This facility is working for a frequency of 700MHz to 6GHz and up to 300V/m with uncertainty 0.7V/m in 10V/m

In the 5kN – 50kN range we can take lead to initiate a inter-comparison programme in the APMP region if sufficient funds are made available to us.