



**AFRIMETS**  
Intra-Africa Metrology System  
Système Intra-Africain de Métrologie



# 2017 - 2018 AFRIMETS – TCM Activities

**Dr. Alaaeldin A. Eltawil**

Chair of AFRIMETS TCM



**11<sup>th</sup> AFRIMETS TCM GROUP MEETING**

**31<sup>st</sup> July – 1<sup>st</sup> August**

**Pretoria, South Africa**

**45 attendee from 17 countries**

## **Development activities and technical presentations**

Characterisation of Quadrupole mass spectrometers (Joint research project between NMISA and PTB) – Mr Brian Yalisi

Update on the Kibble (Watt) Balance and the Avogadro's project at NMISA – Mr Benjamin van der Merwe

Interpretation and application of calibration and interlaboratory comparison results- Mr Mulugeta

Update on the silicon sphere project Si-kg at NIS by Dr. Eltawil

The new ISO 6789:2017 (the standard for torque tools) by Dr Seif Osman.

Mr Brian Yalisi gave a feedback on the CCM WG Pressure and Vacuum meeting he attended in Columbia in conjunction with the IMEKO TC 16 Conference.

# Comparisons

## **AFRIMETS.M. P-K7 (Pressure 10 – 110 kPa)**

The artefact was stacked in customs for almost two years in Tunisia. In 2016 it was released then has been characterised and ready for circulation. It was mentioned that, INRIM which was one linking laboratory for the comparison pulled out, therefore need to be replaced. Pilot lab was asked to request PTB to be the linking laboratory beside NIS for the CCM.P-K7. Protocol will be updated with the new schedule of circulation. It was also agreed that the reference value will be determined from results of those laboratories who have primary standards.

## **AFRIMETS.FF-K4.2015**

Measurements are running with very good progress

## **AFRIMETS.M.M-S6**

A revised report was submitted in May to the BIPM (Chair of CCM WGD-kg) for approval and publishing.

## **AFRIMETS.MM-K7**

LPEE/LNM- Morocco provided the artefacts

NIS is currently doing several tests such as stability, magnetic susceptibility and surface characterisation etc. prior to circulation. The circulation is expected next year after completing all tests and measurements. METAS of Switzerland will be the second linking laboratory since the ILC is registered as a key comparison.

## **AFRIMETS. D-K4**

Liquid Density (Hydrometers-Hydrostatic weighing)

NIS of Egypt is doing measurements after completion they will send the artefact to CENAM (Mexico) after which it will be sent to NMISA. The comparison requires the use of the Cuckow's method.

## Proposed comparisons

**70 MPa hydraulic pressure** comparison was previously agreed that NMIE – Ethiopia will Co- pilot the comparison with NIS. NMIE then propose 100 MPa because of availability of the artefact. NMIE prepared a protocol for the comparison and provided an artefact. There was a request to have the second artefact for the comparison due to large number of participants. Communication will be circulated to interested participants to confirm participants. Brian Yalisi was asked to approach CENAM of Mexico or any other NMI to be the linking laboratory with NIS.

**Force 50kN** – no artefact available for the comparison. The main challenge was institutions having different readout units and most not having the capability (bridge) to calibrate the readout units. Suitable artefact will be sought to start the comparison.

- **12<sup>th</sup> AFRIMETS TCM GROUP MEETING**
  - **16- 17 July 2018**
  - **Enugu, Nigeria**

26 attendee from 12 countries.

## Development activities and technical presentations

- Investigation on the new uncertainty parameters in ISO 6789-2017  
by Dr. K.M. Khaled from NIS, Egypt.
  - NIS projects and researches during 2016 to 2018 regarding force, torque and hardness  
by Dr. K.M. Khaled from NIS, Egypt.
  - Traceability for blood pressure measurements  
by Mr. Brian Yalisi from NMISA, South Africa.
  - Force, TORQUE AND HARDNESS in Kenya  
by Mr. Josephat Bangi from KEBS, Kenya.
  - Beyond Redefinition of the kilogram  
by Mr. Thomas Mautjana from NMISA, South Africa.
- Current researches in Mass, Density and Pressure lab at NIS- Egypt  
by Dr. Alaaeldin A. Eltawil from NIS, Egypt.
- The TC asked Dr. K.M. Khaled to highlight the importance of research work in torque Metrology to satisfy the customer needs.



- **Feedback for attending of meetings BIPM and/or other RMOs meetings (Chair: Dr. K.M. Khaled)**
- Two brief presentations were presented; The first was by Mr. Brian Yalisi (NMISA, South Africa) about attendance of APMP meeting 2017 in India and focusing on the traceability of medical devices. The other was about attendance of Mr. Ondoro (KEBS, Kenya) in the activities of flow work group in Australia 2016.

- **Running comparisons**

- AFRIMETS M.M-K7 (Mass)
- Dr. Alaaeldin A. Eltawil gave a presentation about the stability measurements of artefacts, carried out by NIS, Egypt. The measurements show good stability of the artefacts, only the 500 mg mass needs more measurements.
- Measurements of the density and magnetic properties are completed.
- Measurements that were carried out along the past year were presented.
- Expect to start circulation of the artifact by Autumn this year.
- Nigeria , Tanzania and Namibia asked for participation in this comparison. They are oriented to contact the pilot lab to study each case.

- AFRIMETS M.P.K7 (Pressure)
- The artefact is at PTB waiting for conducting the measurements.
- The artefact will be sent to South Africa after PTB carried out the measurements. Then it will be circulated to Ethiopia and Morocco to conclude.
- 
- AFRIMETS F.F.K4.2.2 (Volume)
- KEBS, Kenya give a presentation about the comparison.
- Report Draft A was circulated
- Draft B is expected

## • **Proposed comparisons**

- **Volume supplementary comparison (proposed by KEBS, Kenya)**
  - Range: Measure the volume of metallic tanks of 20 L.
  - artefact: KEBS, Kenya.
  - Pilot lab.: KEBS, Kenya.
  - Participants: Egypt, Zamiba, Tanzania, Uganda, and South Africa. The pilot lab. asked to send invitation to AFRIMETS TCM members.
- **Gas flow supplementary comparison (proposed by NMISA, South Africa)**
  - Range: 2000 ml/min.
  - artefact: NMISA, South Africa.
  - Pilot lab.: NMISA, South Africa.
  - Participants: Egypt. The pilot lab. asked to send invitation to AFRIMETS members.

## • **Proposed comparisons**

- Force supplementary comparison (proposed by KEBS, Kenya)
  - Range: 500 kN compression force.
  - artefact: NMISA, South Africa (500 kN force transducer + cable + BN100A calibrated bridge calibration unit).
  - Pilot lab.: KEBS, Kenya.
  - Participants: South Africa, Germany, and Egypt.

**STANDARDS ORGANISATION OF NIGERIA (SON)**



**AFRIMETS**  
Intra-Africa Metrology System  
Système Intra-Africain de Métrologie

1<sup>st</sup> AFRIMETS G... & Related Meetings,  
G...

