



AFRIMETS TECHNICAL COMMITTEE FOR THERMOMETRY (TC-T) activities

Efrem K Ejigu

May 2014

Your measure of excellence

CONTENTS

- ❑ INTRODUCTION
- ❑ TC-T MEMBER COUNTRIES
- ❑ TC-T MEMEBR LABORATORIES
- ❑ AFRIMETS INTER COMPARISONS
- ❑ S-RMO INTER COMPARISONS
- ❑ TC-T FUTURE PLAN
- ❑ CONSTRAINTS

INTRODUCTION

- It is an AFRIMETS forum for scientific and technical cooperation in thermometry
- Is responsible for organising and executing key and supplementary comparison in thermometry
- Working towards the improvements of Calibration and measurement capabilities (CMCs) of AFRIMETS thermometry.
- Working towards AFRIMETS thermometry capacity development through manpower and facilities development

TC-T MEMBER COUNTRIES



TC-T MEMBER LABORATORIES

Country	Measurement Range	Fixed Point Cells	Sensors	Maintenance media
Kenya	-40° - 1300°	Hg, wtp, Ga, Sn, Zn	SPRT-25 Ω, PRT-100 Ω, TC Type S	Alcohol, ice, water, oil, sand, furnace
Tunisia	-80° - 1200°	Hg, wtp, Ga, In, Sn, Zn, Al	SPRT-25 Ω, SPRT-100 Ω, TC Type S	Alcohol, ice, water, oil, furnace
Morocco	-80° - 1100°	Hg, wtp, Ga, In, Sn,	SPRT-25 Ω, SPRT-100 Ω, TC Type S	Alcohol, ice, water, oil, furnace
Ghana	-80° - 1200°	None	SPRT-25 Ω, PRT-100 Ω, TC Type S, Type B	Alcohol, ice, water, oil, furnace
Ethiopia	-40° - 1200°	Hg, wtp, Ga, Sn, Zn, Al	SPRT-25 Ω, SPRT-100 Ω, TC Type S, Type B	Alcohol, ice, water, oil, sand, furnace

TC-T MEMBER LABORATORIES cont....

Country	Measurement Range	Fixed Point Cells	Sensors	Maintenance media
Tanzania	-40° - 1200°	None	SPRT-25 Ω , PRT-100 Ω , TC Type S	Alcohol, ice, water, oil, furnace
Zambia	-80° - 1300°	Hg, wtp, Ga, In, Sn, Zn, Al, Ag, Cu	SPRT-25 Ω , SPRT-100 Ω , TC Type S, Type R	Alcohol, ice, water, oil, furnace
Seychelles	-30° - 250°	None	PRT-100 Ω	ice, water, oil
Zimbabwe	-40° - 1200°	Hg, wtp, Sn, Al	SPRT-25 Ω , PRT-100 Ω , TC Type S	ice, water, oil, furnace
Namibia	-40° - 280°	None	SPRT-100 Ω , PRT-100 Ω , TC Type S, Type R	Alcohol, ice, water, oil, Dry block
Botswana	-40° - 1100°	None	SPRT-25 Ω , SPRT-100 Ω , TC Type S, Type R	Alcohol, ice, water, oil, furnace

AFRIMETS INTER COMPARISON

- AFRIMET. T-S1

- Supplementary comparison of Industrial PRT calibration capability
- Range: -50 °C to 450 °C
- Started: March 2008
- Addressing comments on Draft B from WG 7
- NMI result anomalies at some temperature values, Equipment details, traceability of reference SPRT, etc..
- Participants are requested to provide information on the commented issues
- Status: To prepare final report
- Participating NMI's
 - South Africa, Egypt, Ethiopia, Kenya, Thailand, Uganda, Tanzania, Seychelles, and Mauritius.

- AFRIMET. T-S2

- Supplementary comparison of Industrial PRT calibration capability
- Range: -50 °C to 450 °C
- Started: May 2012
- Participating NMI's
 - South Africa, Tunisia, Egypt, Morocco, Ghana, Burkinfaso, Benin
- Status: Under circulation

CONT...

- AFRIMET. T-S3

- Supplementary comparison of Industrial PRT calibration capability
- Range: -50 °C to 450 °C
- Started: May 2012
- Status: Under circulation
- Participating NMI's:
 - South Africa, Zambia, Zimbabwe, Botswana, Namibia, Mozambique, Uganda, Rwanda, Democratic Republic of the Congo

S-RMO INTER COMPARISONS

- EAMET (East African Metrology)

- i. Industrial PRT comparison
Pilot :Uganda
- ii. Thermocouple comparison

- MAGMET (Maghreb Metrology)

- i. SPRT inter comparison
Reference Lab: NMI of France
Pilot: Tunisia
Participants:
- ii. FIXED POINTS (Hg – Sn)

CONT...

- SADC MET (Southern Africa Metrology)

- i. PRT inter comparison

- Reference Lab: South Africa
 - Pilot: Zimbabwe
 - Participants: Namibia, Zambia, Botswana

- ii. Thermocouple inter comparison

- Reference Lab: South Africa
 - Pilot: Zimbabwe
 - Participants: Namibia, Zambia, Botswana

- iii. Electrical Simulation inter comparison

- Reference Lab: South Africa
 - Pilot: Zimbabwe
 - Participants: Namibia, Zambia, Botswana

TC-T FUTURE PLAN

- Future plan objective includes:
 - CMC publication into BIPM database
 - To get more members into the CC-T
 - To encourage more member countries to seek BIPM membership
 - Capacity building
 - Training workshop/seminars/courses
 - Laboratory attachment/internship
 - Equipment and facilities
 - Accreditation/peer review
- Detail Plan
 - Key and supplementary comparison
 - i. To finalize AFRIMETS TS-2 and AFRIMETS TS-3
 - ii. Noble metals thermocouple
 - Pilot: Egypt
 - Draft protocol is to be ready
 - iii. Electrical simulation
 - Range: 4-20 mA
 - Pilot: Tunisia
 - iv. Radiation Thermometers
 - Pilot: Morocco
 - Participants: Zambia, Tanzania, Morocco, Ethiopia, Tunisia, Kenya

CONT...

- v. SPRTs at fixed points
 - Artefact: 25 Ω SPRT
 - Range: Hg – Zn
 - Participants: South Africa, Egypt, Zambia, Morocco, Ethiopia, Tunisia, Zimbabwe. Kenya
 - Pilot: South Africa
- vi. Liquid in glass thermometers
 - Artefact: Alcohol LIG
 - Range: -20 °C – 110 °C
 - Pilot: Kenya
- vii. Dial gauge temperature indicators
 - Artefact: Dial Gauge Temperature Indicators
 - Range: -40 °C – 110 °C
 - Pilot: Namibia
- Training and work shop
 - Fixed point cells training symposium by FLUKE
 - » Date: August 2013
 - » Place: Kenya.
 - Conditioned Chambers (temperature installation)
 - » Date: July 2014
 - » Place: Addis Ababa, Ethiopia
 - Humidity measurement
 - » Date: not decided
 - » Place: Kenya/South Africa

CONT...

- Internship/Attachment
 - ❖ MOU to be sought for industrial attachments on bilateral/regional basis to NMI's that such as KRISS, NMISA, NIM etc...
- Equipment and Facilities
 - Sourcing of donor funding for equipment and facilities. Project proposal to be drafted
- Accreditation
 - Compliments the peer review process
 - Training of more technical assessors
 - Technical assessors from an NMI of different S-RMO to the institute being assessed to be encouraged.
- Peer review
 - Conduct work shop on preparation of CMCs
 - Practical peer review exercise
 - Preparatory assessment by peers using other tried and tested models

CONSTRAINTS

- Lack of sufficient fund
 - Inter RMO and intra SRMO comparison
 - Equipment and facilities improvement
 - Thermometry skill development
- Capacity gap in traceability maintenance
- Small number of TC-T members

THANK YOU



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