Report on Sistema Interamericano de Metrología (SIM) Activities in Thermometry and Humidity to the 27th meeting of the CCT

May 21th-23th 2014

BIPM

Sèvres,France

(SIM) Activities in Thermometry and Humidity from 2012 to 2014

About SIM

- Regional Metrological Organization (RMO) that resulted from a broad agreement between 34 countries (OAS Members)
- Created to promote international and regional metrological cooperation among the American countries

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SIM Organization

- With own Mission, Vision and Values including
- To be a representative, transparent, competent, and worldwide-recognized regional metrology organization
- Cooperation between SIM country members to ensure uniformity of measurements improving technical competence and quality infrastructure

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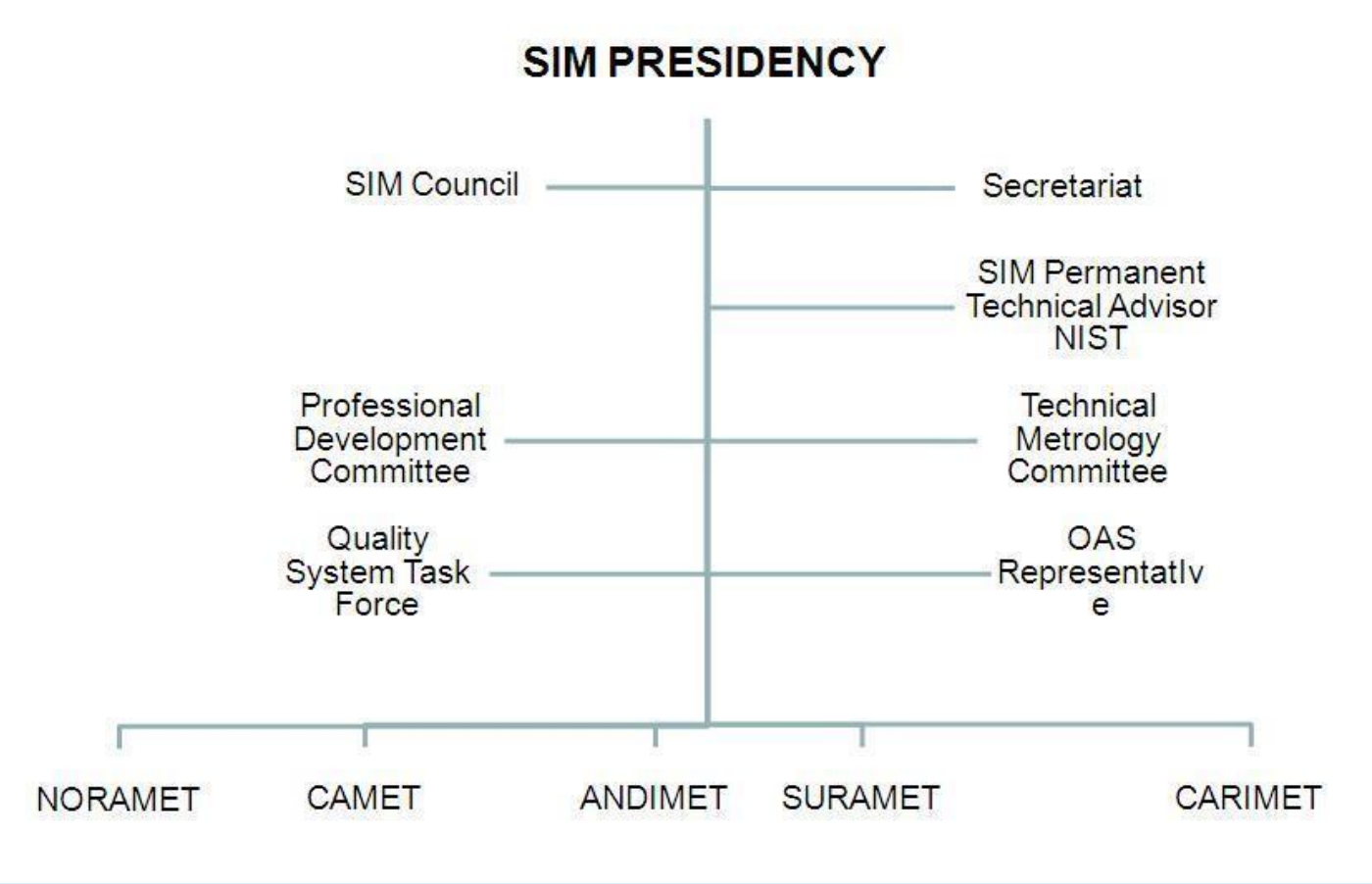

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- The Technical Metrology Commitee has several Metrology Working Groups.
- Being

SIM MWG 3 Metrology Working Group of Thermometry

- TC has a meeting every year at SIM General Assembly

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- Comparisons in Progress

SIM.T-K6.1	**Realizations of local scales of dew/frost-point temperature of humid air , 2011** **Key comparison in Thermometry, Humidity** **Temperature range: -25 °C to +20 °C** **Bilateral NIST/NRC** **Draft B circulated between the participants, revisions expected prior to submission to WG7 based on comments received on the K6.2 and K6.3 reports**
SIM.T- K6.2	Realizations of local scales of dew/frost-point temperature of humid air, 2010 Key comparison in Thermometry, Humidity Temperature range: -20 °C to +20 °C Bilateral NIST/CENAM Report submitted to WG7, revision under review by WG7
SIM.T-K6.3	Realizations of local scales of dew/frost-point temperature of humid air, 2010 Key comparison in Thermometry, Humidity Temperature range: -30 °C to +20 °C Bilateral NIST/INMETRO Report submitted to WG7, revision in preparation
SIM.T-K9.1	Realizations of the ITS-90 from 273.16 K to 692.7 K, 2012 Key comparison in Thermometry, Standard Platinum Resistance Thermometers Fixed points of Ga (302.9146 K), Sn (505.078 K), and Zn (692.677 K) Report submitted to WG7, revision in preparation
SIM.T-S3	Comparison of platinum resistance thermometers, 2007 – 2008 Supplementary comparison in Thermometry, Standard Platinum Resistance Thermometers Temperature range: -39 °C to 232 °C Report in progress, Draft B. WG7 comments sent to the participants Nov. 2012.
SIM.T-S4	SPRT calibration comparison at Hg, TPW, Ga, Sn and Zn ITS-90 fixed points, 2008 Supplementary comparison in Thermometry, Standard Platinum Resistance Thermometers Report submitted to WG7, revision in preparation

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- **Comparisons approved and published in the KCDB:**

SIM.T- K6.4	**Comparison of humidity standards, 2010 – 2011** **Key comparison in Thermometry, Humidity** **Temperature range: -20 °C to +60 °C** **Bilateral INMETRO/INTI** **Approved for equivalence**
SIM.T- S1	Comparison of Type K thermocouples, 2004 Supplementary comparison in Thermometry, Thermocouples Temperature: 100 °C to 1100 °C Approved and published
SIM.T- S2	Comparison of platinum resistance thermometers, 2004 – 2005 Supplementary comparison in Thermometry, Standard Platinum Resistance Thermometers Temperature range: -40 °C to 250 °C Approved and published

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- **Comparison proposals marked as "planned" in the KCDB**

SIM.T- S5	**Comparison of the calibration of 100 ohms platinum resistance thermometers, 2013 – 2014** **Supplementary comparison in Thermometry, Standard Platinum Resistance Thermometers** **Planned. Protocol approved by WG7.**
SIM.T-S6	Comparison of Type S thermocouples, 2012 – 2014. Suplementary Comparison. Measurand: emf, depending on temperature voltage Status: Report in progress, Draft A

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- **New CMCs**

At this time SIM Countries have declared 277 Calibration and Measuring Capabilities:

- Two SIM countries have new CMCs published in Appendix C of the BIPM KCDB:
- Costa Rica http://kcdb.bipm.org/appendixC/T/CR/T_CR.pdf (8 CMCs) and;
- Perú http://kcdb.bipm.org/appendixC/T/PE/T_PE.pdf. (43 CMCs)
- This has been a considerable effort of those countries to demonstrate their technical capabilities by participating in Supplementary and Key Comparisons .
- Costa Rica participating at EURAMET.T-K3.3 (http://kcdb.bipm.org/AppendixB/KCDB_ApB_info.asp?cmp_idy=1087&cmp_cod=EURAMET%2ET-K3%2E3&page=1&search=1&cmp_cod_search=&met_idy=9&bra_idy=0&epo_idy=0&cmt_idy=0&ett_idy_org=0&lab_idy=&cou_cod=CR)
- Perú participating at SIM.T-S2 and SIM.T-K9.1

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- **New CMCs**
- Other countries having CMCs have re declared CMCs or declared CMCs (Canada and USA). Canada re declared Zn freezing point approved on 17 January 2013.
- Canada declared or re declared 10 CMCs in the IPRTs service category, they have been approved on 20 January 2014.
- USA declared 7 CMCs in Humidity service category (chilled mirror hygrometers) and Ag freezing points for SPRTs,they have been approved on 17 January 2013.

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- **New Members of BIPM**

Colombia became a signatory of CIPM MRA on 15 May 2013.

- **Other SIM Activities**

NIST Guest Reseacher Program

In 2012 NIST hosted two Guest Reseachers from SIM:

- Luis Chaves Santa Cruz (LACOMET, 1 year)
- Verónica Ponticorbo Manfrino (LATU, 4 Months)

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- **Other SIM Activities**

Thermometry Workshops at CENAM

A three week thermometry workshop, partly funded by SIM and PTB, was held at CENAM (México) from 26 August to 13 September 2013.

The purpose of the workshop was to train SIM MWG3 Members in:

- Radiation Thermometry from 26 August to 30 August;
- Platinum Resistance Thermometry from 2 September to 6 September;
- Relative Humidity in Gases, from 9 to 13 September.

SIM MWG3 is planning to hold the workshop again in 2015.

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- SIM Metrology School at NIST (October 2014)

NIST hosted 53 students from 29 countries at the SIM Metrology School in Gaithersburg. This metrology school included many aspects of metrology (including temperature).
http://www.nist.gov/pml/newsletter/sim-metrology-school-at-nist.cfm

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- **Future Activities**
- A meeting of the SIM MWG3 is planned coincident with the *Simposio de Metrología* 2014 (https://www.cenam.mx/simposio/) which is being held at CENAM in Querétaro, México. The focus will be on training to declare CMCs and plan comparisons.
- SIM will continue its efforts to assist SIM MWG3 Members to:
- develop new comparisons supporting the declaration of CMCs, especially in Humidity and Radiation Thermometry;
- declare CMCs;
- increase interaction among the member countries in the field of thermometry.

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Thank you!