



SISTEMA INTERAMERICANO DE METROLOGÍA

SIM MWG7

PRESSURE AND VACUUM SUBWORKING GROUP

Report of the Chairman Juan Forastieri - INTI - Argentina

Period April 2014 to May 2017

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CCM PV– Colombia - 2017



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1. Introduction

This presentation summarizes the activities performed by the SIM Pressure Working Group carried out during the period 2014 - 2017. The activities considered are: laboratory comparisons, training courses, training in laboratory, technical assistance, traceability within SIM, CMCs in the CIPM database, and technical guides.

2. Comparisons

The comparisons presented are running or finished at this moment; include NMI's from all regions of SIM



Type	Range	Participating NMI's	Pilot Laboratory	Period	Status	CCM comparison
Key	0.6 to 7 MPa Gauge pressure	NIST, CENAM, LACOMET, CENAMEP, LANAMET, IBMETRO, ENEN, INDECOPI, INTI, INMETRO, ENAER, LATU, INTN	INDECOPI	2013	Suspended	SIM.M.P-K1c
Key	10 to 120 kPa Absolute pressure	NIST, CENAM, INACAL, INTI, INMETRO, INM	INTI	2017	New schedule.	SIM.M.P-K2
Key	10 to 100 kPa Negative gauge pressure	NIST, CENAM, LACOMET, CENAMEP, LANAMET, IBMETRO, ENEN, INDECOPI, INTI, INMETRO, ENAER, LATU, INTN	INMETRO	2013	Suspended	SIM.M.P- S5
Key	0,6 to 7 MPa Effective area	NIST, CENAM, LACOMET, BSJ, CENAMEP, NRC INDECOPI, INTI, INMETRO, ENAER	CENAM	2017	Finished with final report	SIM.M.P-K1
Key	10 to 120 kPa Efective area	NIST, CENAM, LACOMET, BSJ, CENAMEP, NRC INDECOPI, INTI, INMETRO, ENAER	CENAM	2017	Finished with final report	SIM.M.P-K6
key	10 ⁻⁴ to 1 Pa	CENAM-INRIM-KRISS-METAS-NIST-NMIJ	METAS	2016	Finished with final report	CCM-P-K15
key	1 to 10 000 Pa	CENAM-CMI-NIST-NMIJ-NMISA-PTB-VNIIM	NIST	2016	Finished with final report	CCM-P-K4

2. Comparisons

The comparisons presented are running at this moment or had finished; include NMI's from all regions of SIM.



Type	Range	Participating NMI's	Pilot Laboratory	Date	Status	CCM comparison
Key	3E-6 to 9E-3 Pa Absolute mode	NIST-PTB	NIST	2010	Report in progress, Draft A	CCM.P.K3.1
Key	0,1 mPa to 1Pa Absolute mode	CENAM-INRIM-KRISS-METAS-NIST-NMIJ-PTB	METAS	2012	Report in Progress	CCM.P-K14
Key	10 to 100 kPa Gauge pressure	NIST, CENAM, INACAL, INTI, INMETRO, INM	INTI	2017	New schedule	SIM.M.P-K6.1
Suppl	100 Pa to 70 kPa Absolute mode	NIST - NPLI	NIST	2008	Draft A	SIM.M.P-S1
Suppl	20 to 200 kPa Gauge mode	CENAM – LNE - INMETRO	CENAM	2011	Draft A	SIM.M.P-S2
Suppl.	34 to 344 kPa	INACAL – ENAER	ENAER	2010	Draft A	SIM.M.P-S3
Suppl	344 to 3447 kPa	INACAL – ENAER	ENAER	2010	Draft A	SIM.M.P-S4
Suppl	7 to 70 MPa	CENAM-IBMETRO-INACAL-INEN-INM-INTN-LATU	CENAM	2016	Finished with final report	SIM.M.P-S7
Suppl.	0 to 70 MPa	ENAER-INTN	ENAER	2012	Draft A	SIM.M.P-S8
Suppl.	0 a 2 MPa	ENAER-LATU	ENAER	2012	Draft A	SIM.M.P-S9
Suppl.	700 kPa to 7 000 kPa Gauge mode	CENAM – INACAL – LATU – ENAER – LACOMET - INM	INACAL	2015	Finished with final report	SIM.M.P-S10
Suppl	Vacuum	CENAM – INTI - INMETRO	INMETRO	2015	Draft A in progress	SIM.M.P- S11

3. Training Courses



The training courses offered to SIM national laboratories are presented in this table

Course subject	Attendees	Dates	Training Laboratory
PRACAMS Proyect Pressure course	Costa Rica	2014	CENAM
High Pressure	Nicaragua	2014	CENAM
High Pressure	Guatemala	2015	CENAM
High Pressure	Ecuador	2016	CENAM

4. In Laboratory Training

Some members from SIM National Laboratories have been trained at other National Laboratories. This table shows two examples of such training



Visiting Laboratory	Training Laboratory	Year	Status
TTBS	INMETRO	2016	Finished
INNOQ(Mozambique)	INMETRO	2016	Finished
Paraguay	NIST	2016	Finished
Costa Rica	NIST	2014	Finished
Jamaica - Costa Rica - Ecuador	CENAM	2015	Finished
Colombia	NIST	2016	Finished
Colombia	CENAM	2014	Finished
Colombia	NSCLI	2016	Finished
Perú – Paraguay - Honduras	CENAM	2016	Finished
Sudáfrica	CENAM	2016	Finished
Perú	INM	2015	Finished
Colombia	CEM	2015	Finished



5. Technical assistance

Some experts from SIM have given technical assistance to different SIM NMI

Advisor Laboratory	Laboratory assisted	Year	Comments
CENAM	INEM	2014	Peer Review
CENAM-INTI	LACOMET	2016	Peer Review
INMETRO	INTN	2016	Peer Review
CENAM	INACAL	2014	Peer Review

6. Pressure Traceability within SIM



List of the activities of traceability of standards of National Laboratories performed within SIM

Laboratory	Standard	Year	Traceable to
INTN	Pressure balances and absolute transducer	2014	INTI INMETRO
LATU	Pressure balances and absolute transducer	2015	CENAM INTI
LACOMET	Pressure balance	2014	CENAM
INTI	Vacuum Transducer	2014	CENAM
ENAER	Pressure balance and diving bell	2015	CENAM
INEN – LATU – INACAL - CENAMEP	Pressure balance	2016	CENAM

7. CMCs in BIPM database

During this period all revisions of the CMC's from other regions were answer in time.



8. Activities in pressure Congress

- *Some NMIs and participated and presented papers in Symposium of Metrology CENAM 2014 – 2016*
- *Three NMI (Mexico, Argentina, Brasil) had assisted to CCM PV meeting in BIPM 2014*
- *In Colombia (Pereira) took place from 7 to 10 May 2017 the 6th International Conference on Pressure and Vacuum Metrology and 5th International Conference IMEKO TC 16.*
- *In Colombia (Pereira) took place the days 5 and 7 May 2017 the seminar: “Pressure and Force Measurement for Emerging Technologies”. It was organized for SIM*
- *In Colombia (Pereira) took place the days 4 and 6 May 2017 the meeting SIM-Working Group in Pressure.*



9. Comments and Conclusions

- It is important to work about the equivalence of measurements among the SIM national laboratories.**
- For this reason, it is important that the most developed laboratories from SIM link CCM key comparisons to others NMI's of SIM.**
- During this period all revisions of the CMC's from other regions were answer in time**
- It is necessary to produce the report of comparisons on time.**
- The new SIM WG7 Pressure co- chair was elected for the next 3 years.
Dr. Jorge Torres (CENAM)**



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