



# **MWG7 - FORCE AND TORQUE WORKING SUBGROUP ACTIVITIES REPORT**

**(period 2007 to 2008)**

**October 27th , 2008 - Queretaro**

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# FORCE AND TORQUE WORKING SUBGROUP ACTIVITIES - MWG7

## Period 2007 to 2008

*October 27<sup>th</sup>, 2008*

### **1. Training:**

As a product from the questionnaire results analysis, a propose for having training in 'Advanced Metrology of Force' was presented:

Place: Force Laboratory of Inmetro (Brazil)

Period: 03 days (between March and May 2009)

Participants: 15 (maximum)

Program: Force Standardization; Force Measuring Instruments; Calibration Standards and Guides (ISO 376, ISO 7500); Data processing; Theoretical and Experimental Exercises.

Training in 'Torque Wrench Calibration' during the Simposio de Metrologia – October, 2008, CENAM.

### **2. Comparisons**

Brazil and Mexico participate the 1kN·m torque key comparison CCM.T-K1 (PTB/Germany as pilot), which was ended in 2007. REPORT IN PROGRESS – DRAFT B.

Brazil, Mexico and USA participate the 100kN force key comparison CCM.F-K2.a (NPL/England as pilot). REPORT IN PROGRESS – DRAF A.

Mexico and Argentina are developing some study on a multicomponent force transducer applied to Primary Standard Machines.

### **3. CMC analyzed**

It was analyzed the CMC's for force services from APMP (04 countries answered positively and report was sent in time).

### **4. Events**

20<sup>th</sup> Conference on Measurement of Force, Mass and Torque (together with the 3<sup>rd</sup> Conference on Pressure Measurement and the 1<sup>st</sup> Conference on Vibration Measurement), November/2007, Merida/Mexico.

International Congress of Mechanical Metrology – I CIMMEC, October 2008, Rio de Janeiro: 89 papers presented (21 in Mass and related quantities and 07 in Force and Torque)

### **5. The questionnaire for Force and Torque**

Update of technical contacts in force and torque;

Send of the questionnaire asking information as: instruments and standards, sectors of industry, guide standards, papers published, training needs, relation with accredited laboratories, CMC's;

- 12 countries answered the questionnaire (Argentina, Brasil, Bolivia, Canada, Chile, Colombia, Guatemala, Mexico, Panama, Peru, Uruguai, USA);

- Some highlight results:

<i>Quantities</i>	total NMIs
Force	3
Torque	0
Force and Torque	7
None	2

<i>Sectors of industry</i>	total NMIs
Metal Mechanics	9
Oil & Gas	5
Metallurgic	7
Legal Metrology	3
Aviation	9
Development and research	7
National accreditation labs	6
Automotive	4
others (civil construction)	4

<i>Standard guides</i>	total NMIs
International	5
National	1
Both	4
Own methods	2

<i>Technical production</i>	total NMIs
Does investigation	7
Does not	3
Did not answer	2

<i>papers/year</i>	total NMIs
3 papers or more	2
2 papers	2
1 paper	2
None	4

<i>Training</i>	total NMIs
Basic force metrology	5
Basic torque metrology	6
Advanced force metrology	8
Advanced torque metrology	8

Uncertainty in force	9
Uncertainty in torque	8
Test machines	7
ISO 17025	6

*Relation with accredited*

<i>labs</i>	total NMIs
calibrate instruments	8
give training	5
auxiliary during valuation and accreditation	8
don't have a net	1

<i>CMC's</i>	total NMIs
Submitted	8
NOT submitted	2
Need comparison	8

**6. Conclusions (brief agenda)**

Report these first general results from the questionnaire, with points in common, and then have specific analysis, giving feedback to each NMI.

Set focus to the development of the Second Step of 'Proyecto Triangular':

- Calibration of force testing machines – ISO 7500 – with the participation of Germany, Chile, Andinos (Colombia, Ecuador, Peru, Bolivia) more Uruguay, Paraguay and Panamá;
- International recognition of these countries CMC;
- Participation of Mexico, Brasil and Argentina in a final comparison program.

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