

How to participate effectively in comparisons

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Outline

- ◆ RMO Comparisons
- ◆ Declaration Forms and Progress Reports
- ◆ Anomalous Results
- ◆ Chart for Organising Comparisons
- ◆ My experience
- ◆ References

RMO Comparisons

The traditional role of international comparisons is to compare national measurement standards and test new techniques.

- ♦ RMO comparisons are discussed and agreed upon in the corresponding RMO TCs
- ♦ RMO key comparisons (KCs) can only be initiated, when a CC KC having the same scope has been completed (Draft B)
- ♦ RMO KCs must be approved by the CC WGs and then agreed with the CC
- ♦ Participants: Members of the RMO; corresponding organisations and laboratories from outside with the consent of the members
- ♦ At least two of the participants must have participated in the corresponding CC KC (Link!)
- ♦ RMO supplementary comparisons are fully under the responsibility of the RMOs. They are listed in the KCDB, but the results are not published

Declaration Forms and Progress Reports

- ◆ For each comparison, a declaration form must be filled in Information of the WG chair, the CC and its Executive Secretary and the KCDB Coordinator
- ◆ For RMO comparisons, the declaration form is forwarded by the TC chair to the CC WG chair
- ◆ Besides the declaration form, a progress report must be sent from time to time to the KCDB Coordinator to keep him informed about the status of the comparison
- ◆ Status of comparisons:
- ◆ Declared and agreed, Planned, Protocol complete, In progress, Measurements completed, Report in progress Draft A, Report in progress Draft B, Approved for equivalence, Abandoned

Examples of Technical Protocol

Content

1. Introduction
2. The travelling standards
3. Organisation
 - 3.1 Participants
 - 3.2 Time schedule
 - 3.3 Transportation
 - 3.4 Unpacking, handling, packing
 - 3.5 Failure with a travelling standard
 - 3.6 Financial aspects, insurance
4. Measurement instructions
5. Uncertainty of measurement
6. Measurement report
7. Report of the comparison
8. List of the participants

Annex

- A1. Confirmation note of receipt (fax, e-mail)
- A2. The dispatch note (fax, e-mail)
- A3. Proposed scheme for an uncertainty budget
- A4. Summary of results form


Examples of registration forms, report and etc

Key and supplementary comparisons (and pilot studies) - registration and progress form

Comparison conducted by		in		Date:
1. Subfield:		RMO internal identifier		
2. KCDB identifier:		(for KIs and SS)		
3. Type of comparison:		4. Short description:		
Key <input type="checkbox"/> Supplementary <input type="checkbox"/> Pilot study <input type="checkbox"/>				
5. Measurand and nominal value(s):		Special characters for copying (if required)		
		α β γ δ ε ζ η θ ι κ λ μ		
6. Parameter(s):				
7. Transfer device(s)/sample(s):				
8. Pilot/Coordinating laboratory(ies) (acronyms and countries):				
9. Participating institutes (acronyms and countries):				
10. Progress: (please note date and tick appropriate box to indicate current status)				
Date	Status	Pilot	Supplementary	Key
	Planned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Protocol complete/approved	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	In progress	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Measurement completed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Report in progress	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Report submitted to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Results approved	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Approved for equivalence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Abandoned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:		Publication reference:		
11. Measurement start date:		12. (Expected) measurement completion date:		
13. Contact person's name:				
Address:		Tel.:		
		Fax:		
		e-mail:		
		Web:		

Completed copy to be forwarded to a) CCUI Executive Secretary;
b) relevant CC Key Comparison WG Chairman;
c) Regional coordinator as appropriate;
d) KCDB Coordinator (except Pilot studies): BIPM.KCDB@bipm.org

COOMET AGREED PROJECT

1. Reference No.: 624/GE-a/13	2. Subject Field: Electricity and Magnetism
3. Field of cooperation: Comparison	
4. Working Group: 1. Manana Gelovani, GEOSTM (Georgia); 2. Irina Lukhverchik, BELGIM (Belarus); 3. Zeinalov Maarif, AZSTANDART (Azerbaijan); 4. Vladimir Milojevic and Srdan Calija, IMBIB (Bosnia and Herzegovina); 5. Mirta Navarro Gonzalez, INMET (Cuba); 6. Temirkhanov Damat, KazInMetr (Kazakhstan); 7. Andrius Bartasiusas, VMT/FTMC (Lithuania); 8. V. Kodita, INM (Republic Moldova); 9. Bodii Itgel, MASM (Mongolia).	
5. Subject: Comparison of electrical resistance standards at 100 Ω and 100 kΩ.	
6. Description: It is offered to compare DC electrical resistance standards at 100 Ω and 100 kΩ of the NMI - members of COOMET.	
7. Additional remarks: Results of comparison will be used for: • evaluation (determination, identification) of equivalence of national standards and an estimation of calibration and measuring capabilities of the participant countries. • development of quality management system of participant NMI.	
8. Coordinator's Name: Manana Gelovani Address: Chagali str., 67. 0178 Tbilisi, Georgia Telephone: +995 32 2606653 Fax: +995 32 2613500 E-mail: elmetrology@yahoo.com	
9. Date of the project agreement: 07.10.2014	10. Starting date: 28.10.2014
11. Expected completion date: 29.12.2015	
12. Coordinator's signature: 	13. Date: 07.10.2014

Final Report on project No. 571/GE/12 COOMET.EM-S17

Georgian National Agency for Standards and Metrology

Metrology Institute
Electricity Reference Division

**FINAL
REPORT**

COOMET project no. 571/GE/12

COOMET.EM-S17 supplementary comparison on 10 Ω and 100 kΩ Resistance standards

Manana Gelovani (GEOSTM, pilot)

Bernd Schumacher (PTB)

May 2013

Abstract:

This report presents the results of the bilateral comparison on 10 Ω and 100 kΩ resistance standards performed by the national metrology institutes of Georgia (GEOSTM) and Germany (PTB).

Anomalous Results

- ◆ If the pilot laboratory finds that the results of some participants appear to be anomalous, these participants are invited to check their results for numerical errors
- ◆ No information can be given as to the magnitude or sign of the apparent anomaly
- ◆ If no numerical error is found, the results stand except the participant wishes to withdraw his results, and the complete set is sent to the participants
- ◆ Once all participants have been informed of the results, individual values and uncertainties may be changed or removed, or the complete comparison abandoned, only with the agreement of all participants
- ◆ An institute that considers its result non-representative of its standards may request a separate subsequent bilateral comparison with the pilot institute or one of the participants

Chart for Organising Comparisons

No.	Action	RMO Comparisons		
		KC	SC	PC
1	Member institutes of the CCEM or an RMO make a proposal for a new comparison	X	X	X
2	Proposals are discussed and agreed upon by RMO TCEM	X	X	X
3	Pilot laboratory identified	X	X	X
4	Support group formed (not for bilateral comparisons)	X	X	
5	Proposals must be approved by CCEM	X		
6	Proposals must be approved by the chairperson of the TCEM		X	X

Chart for Organising Comparisons

No.	Action	RMO Comparisons		
		KC	SC	PC
7	Pilot laboratory sends an official invitation to the delegates of the CCEM or the contact persons of the RMO	X	X	
8	Pilot laboratory with the help of the support group prepares declaration form (DF) and technical protocol (TP)	X	X	
9	Pilot laboratory prepares technical protocol (TP)			X
10	DF and TP checked and approved by RMO TCEM chairperson and forwarded to WGLF or GT-RF	X		
11	DF and TP checked and approved by RMO TCEM chairperson and forwarded to the KCDB Manager for registration		X	

Chart for Organising Comparisons

No.	Action	RMO Comparisons		
		KC	SC	PC
12	DF and TP reviewed and approved by chairperson of WGLF or GT-RF	X		
13	TP finally approved by the CCEM	X		
14	Chairperson of WGLF or GT-RF sends DF and TP to BIPM Database Manager for registration	X		
15	Pilot laboratory organizes and carries out the comparison	X	X	X
16	Participating institutes [1] report the results at the latest 6 weeks after completion of measurements	X	X	X

Chart for Organising Comparisons

No.	Action	RMO Comparisons		
		KC	SC	PC
17	Pilot laboratory prepares draft A report and sends it to participants for comments; as soon as Draft A is approved by the participants and any modifications are made, Draft A is considered to be the first version of Draft B; it is then sent to the support group to examine the method of analysis and to check the calculations.	X	X	
18	Pilot laboratory prepares draft A report			X
19	Participating institutes [1] send their comments to the pilot laboratory within the deadline given by the pilot laboratory	X	X	X

Chart for Organising Comparisons

No.	Action	RMO Comparisons		
		KC	SC	PC
20	Pilot laboratory with the help of the support group prepares draft B report and the link to the CCEM KC, if any	X	X	
21	Pilot laboratory prepares final report			X
22	Draft B report approved by the RMO TCEM [1]	X	X	
23	Link to the CCEM KC approved by the RMO TCEM [1]	X		
24	RMO TCEM chairperson forwards draft B reports to WGLF or GT-RF for further consideration	X		
25	RMO TCEM approves report, sends a copy to the KCDB manager with a copy to the WGLF of GT-RF chairperson for information		X	

Chart for Organising Comparisons

No.	Action	RMO Comparisons		
		KC	SC	PC
26	Draft B report and link to the CCEM KC, if any, discussed and approved by WGLF or GT-RF [1]	X		
27	Draft B report and link to the CCEM KC, if any, sent to CCEM for final approval	X		
28	After approval by the CCEM, pilot laboratory sends pdf file of final report, Word file of abstract and Excel file of KCDB entry to BIPM Database Manager	X		
29	Pilot laboratory sends pdf file of final report and Word file of abstract to CCEM Executive Secretary			X
[1]	The participating institutes or the WGLF, GT-RF and RMO TCEM chairpersons ensure that the participants in the comparison are included into the review and approval process			

My experience:

- ◆ Clearly defined and agreed Technical protocol with all participants is base for good comparison (time schedule, special requirements and etc.): **It must be avoided to put the resistors into an oil bath, because they might be damaged!**
- ◆ Special emphasis on the transportation case, when there is no ATA carnet (to simplify the customs formalities; the problem might be occurred for COOMET only), needs more time.
- ◆ Always be in touch with TC chairmen and participants.
- ◆ Need to do “paper work”: indicate any changes with regards to actual time of transportations of travelling standards; remind participants filling in some documents and etc.
- ◆ Remember: comparison is important responsibility, but all participants are busy and able only to participate in comparison, rather than to coordinate the work.
- ◆ Remember: if you need comparison, don't wait that someone will propose it, propose by yourself and don't hesitate to ask an experienced specialist for advice



References:

1. Guidelines for CIPM Key Comparisons.
2. CCEM Guidelines for Planning, Organising, Conducting and Reporting Key, Supplementary and Pilot Comparisons
3. CCEM Guidelines for Comparisons; Annex 1:
Chart for Organising CCEM and RMO Comparisons

https://www.bipm.org/utils/common/documents/jcrb/registration_and_progress_form.pdf

<http://www.bipm.org/en/cipm-mra/guidelines-kcs/>

<http://www.bipm.org/en/committees/cc/ccem/guidelines.html>

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Thank you for your attention!

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