



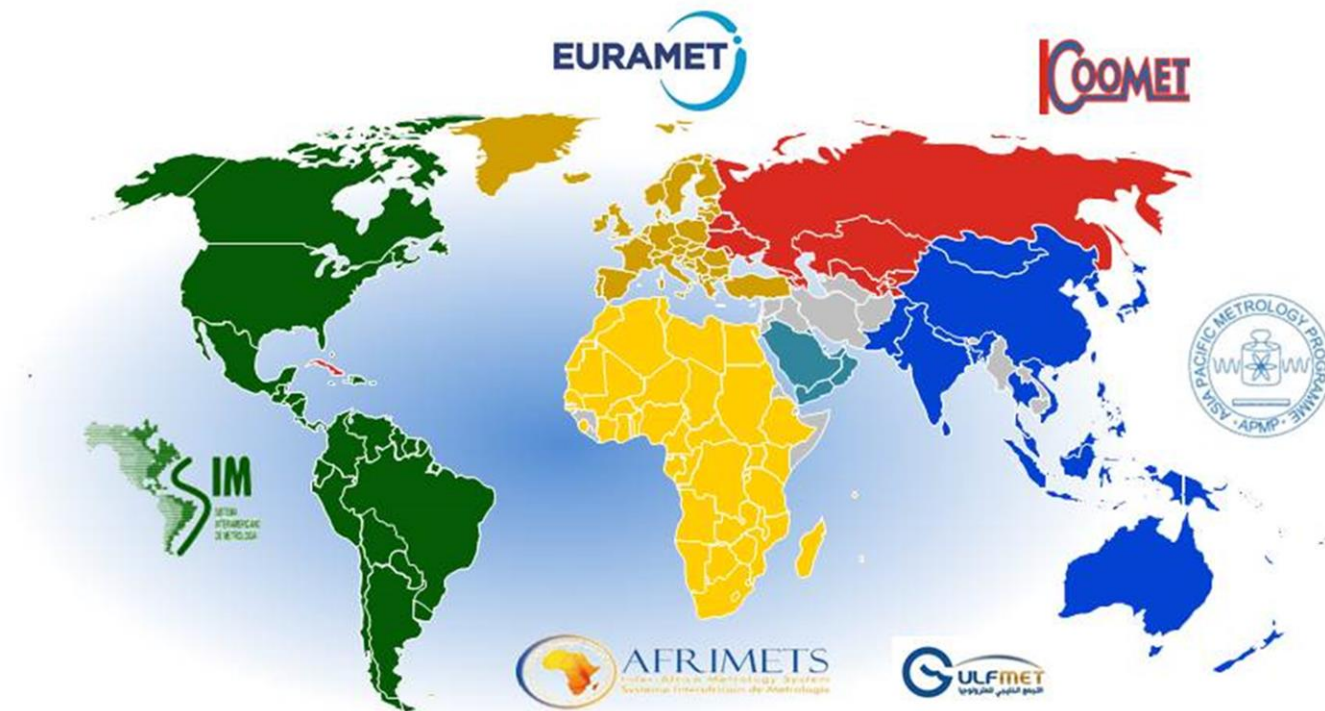
Gulf Association for Metrology

GULFMET *Technical Committee for Mass and Related Quantities*

*Report to CCM
20-21 May 2021*

*Christos Mitsas
TC-Mass Chair*

The GULF Association for Metrology (**GULFMET**) was granted **provisional** acceptance as an RMO by the CIPM in September 2015*.



* JCRB Recommendation JCRB/43-1 (2021) to the CIPM is to admit GULFMET as a full member of the JCRB.

Member

Bahrain

Saudi Arabia (2011)

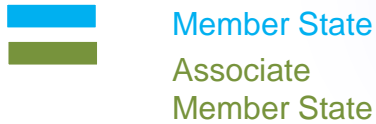
Kuwait (2018)

Oman (2012)

Qatar (2016)

Yemen

United Arab Emirates (2015)



Associate

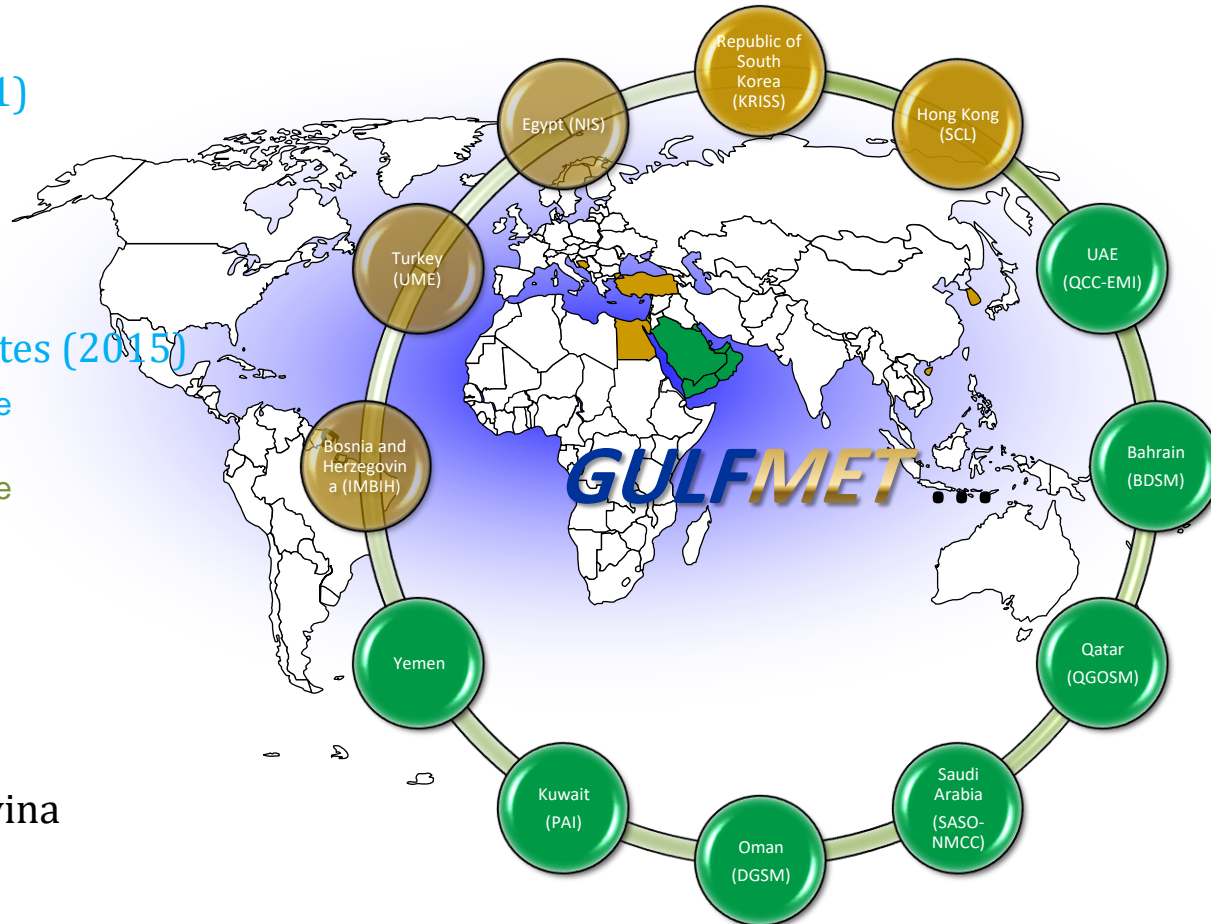
Egypt

South Korea

Turkey

Bosnia & Herzegovina

Hong Kong



TC Details

TC-Mass is responsible for carrying out the activities required by GULFMET for the fulfillment of the CIPM-MRA. Specifically:

- The provision of technical support and facilitation of the intra-RMO CMC review process
- The participation in the inter-RMO review of CMC's
- The organization and technical support of GULFMET Key and Supplementary Comparisons

Currently covers the areas of: **Mass, Pressure, Force, Torque, Density and Volume**

The TC meets bi-annually in April and November

Intra-RMO review of NMI's CMC submissions

One submission by SASO-NMCC in the area of Mass and related quantities (Mass, Pressure, Force and Gravimetry) is currently under review.

- NIS (Egypt) is assisting in the technical review.
- Process followed is according to JCRB approved **GULFMET CMC Submission Process** and **GULFMET Procedure for the Review of Calibration and Measurement Capabilities (CMCs)** GULFMET 03, Issue 3, 18/ 08 /2020

Inter-RMO CMC Review

TC-Mass has contributed to the JCRB inter-RMO CMC review process by undertaking reviews of submitted CMC's.

TC-Mass has declined to review submissions when reviewers with relevant expertise were not available.

	2017	2018	2019	2020
Accepted to review	12	5	12	1
Declined to review	4	7	4	-

Completed Comparisons (Approved & published in KCDB)

- **GULFMET.M.M-S1** *Multiples and submultiples of the kg (10 kg, 500 g, 20 g, 2 g, 100 mg)*
 - UME (Turkey)-pilot, *BDSM (Bahrain), PAI (Kuwait), *QAF (Qatar), SASO-NMCC (Saudi Arabia), QCC-EMI (UAE)
- **GULFMET.M.M-S2:** *Multiples and submultiples of the kg (5 mg, 2 g, 50 g, 1 kg and 5 kg)*
 - UME (Turkey)-pilot, SASO-NMCC (Saudi Arabia)
- **GULFMET M.M.-K4 :** *Comparison of 1 kg stainless steel mass standards*
 - UME (Turkey)-pilot, INRIM (Italy), KRISS (Korea), METAS (Switzerland), PAI (Kuwait), QGOSM (Qatar), SASO-NMCC (Saudi Arabia), QCC-EMI (UAE)
- **GULFMET M.M.-K7 :** *Comparison of multiples and submultiples of the kilogram (5 kg, 100 g, 10 g, 5 g, 500 mg)*
 - UME (Turkey)-pilot, INRIM (Italy), METAS (Switzerland), PAI (Kuwait), QGOSM (Qatar), SASO-NMCC (Saudi Arabia), QCC-EMI (UAE)

Completed Comparisons (Approved & published in KCDB)

- **GULFMET M.P.-S1:** *Comparison in the range of 0.7 MPa to 7 MPa of Gas Pressure*
 - UME (Turkey)-pilot, SASO-NMCC (Saudi Arabia), QCC-EMI (UAE)
- **GULFMET M.F.-S1:** *Force measurements in the range 100 kN to 1 MN*
 - UME (Turkey)-pilot, SASO-NMCC (Saudi Arabia), QCC-EMI (UAE)
- **GULFMET M.F.-S2:** *Force measurements in the range 0.4 kN to 100 kN*
 - UME (Turkey)-pilot, SASO-NMCC (Saudi Arabia)

2021-22 Planned Comparisons*

- **GULFMET.M.FF-S1:** *Calibration of piston operated micro-pipette 100 μ l*
 - Pilot: QCC-EMI (UAE)
 - UME (Turkey), SASO-NMCC (Saudi Arabia), IMBH (Bosnia & Herz.)

- **GULFMET.M.D-S1:** *Comparison in solid density (stainless steel weights 1 kg, 200 g, 20 g, 2 g)*
 - Pilot: QCC-EMI (UAE)
 - SASO-NMCC (Saudi Arabia), UME (Turkey)

- **GULFMET.M.T-S1** *Comparison of torque standards 5 N·m, 10 N·m, 20 N·m & 50 N·m*
 - Pilot: UME (Turkey)
 - SASO-NMCC (Saudi Arabia), QCC-EMI (UAE)

** Originally planned for 2020 but have been postponed due to pandemic*

GULFMET funded R & D activities

***Project Title:** Development of Transfer Standards for Traceability of Hardness Diamond Indenter Calibration Systems*

The project aims at fabrication and metrological characterization of transfer standards to be used to realize the traceability of all components of Rockwell and Vickers hardness diamond indenter calibration systems of TUBITAK UME and SASO NMCC.

- Proposer and coordinator: UME
- Chief stakeholder: SASO-NMCC

Acknowledgments

- Thanks to our Associate Members for supporting GULFMET activities and piloting GULFMET comparisons.
- KRISS, INRIM and METAS participation in GULFMET KC's is gratefully acknowledged.

Thank you!

