



GULF ASSOCIATION FOR METROLOGY

Regional Metrology Organization(RMO)

Introduction of GULFMET TC IR and its capabilities

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Introduction

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Reliable Measurements

قياسات موثوقة

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GULFMET TC IR has newly established in Feb 2021 and its role to:

- Provide forum for GULFMET NMI experts.
- Discuss issues related to Ionizing Radiation
- Join associate members (Turkey, South Korea , Bosian and Herzegovina, and Egypt)
- Provide support in technical capabilities (transfer knowledge and trainings)
- Provide inter-comparisons as technical evidence for their competencies
- Support the members in establishing their Calibration Measurement Capabilities (CMCs)
- Inter-RMO review of CMCs of other RMOs.



GULFMET TC IR Members



UAE
FANR SSDL (DI)



KSA
1. SASO (NMI)
2. KACST
3. KFSHRC



Kuwait
Ministry of Health - SSDL



Bahrain
Waiting for nomination



Qatar
Ministry of Municipality and Environment



Oman
1. Ministry of Health
2. Ministry of Commerce and Industry and Investment Promotion



Bosnia and Herzegovina

Institute of Metrology of Bosnia and Herzegovina (NMI)



Egypt

Ionizing Radiation Metrology Lab (NMI)



South Korea

KRISS (NMI)



Turkey

TENMAK (DI)

GULFMET TC IR Associate Members



GULFMET TC IR Observers

- Only guest in the meetings
- No right to Vote
- Allowed to participate TC IR activities (trainings and comparisons) as per IAEA – GULFMET Cooperation.



Jordan
JAEC



Uzbekistan
Uzbek National Institute
of Metrology



Iraq
Ministry of Science and
Technology (MOST)



Lebanon
Lebanese Atomic
Energy Commission
(CNRS)



Syria
Atomic Energy
Commission of Syria
(AECS)



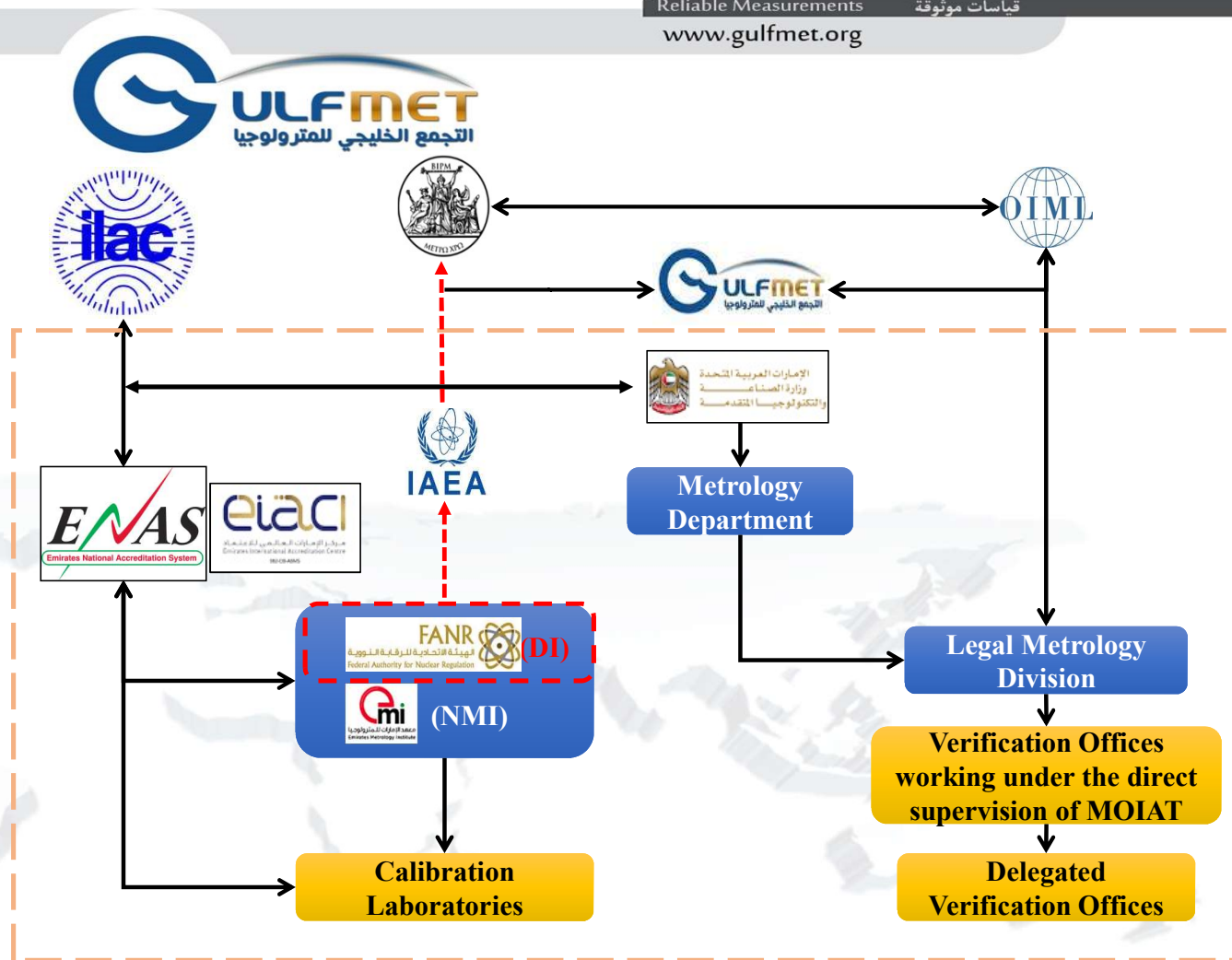
Yemen
National Atomic
Energy Commission
(NATEC)

Metrological structure

UAE



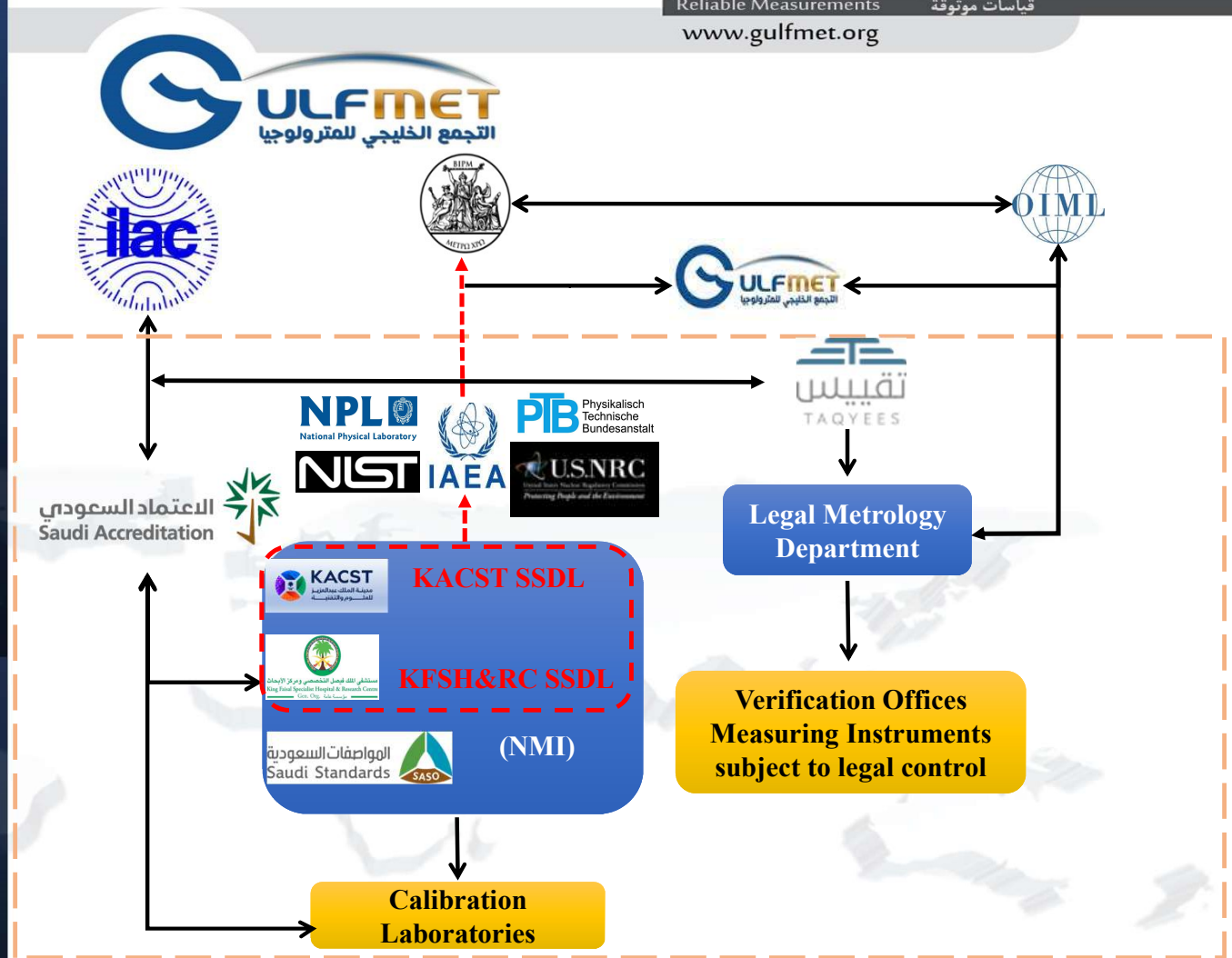
-  Traceability
-  Emirate Metrology Institute
-  FANR SSDL
-  Accreditation Body
-  Accreditation Body
-  Ministry of Industrial and Advanced Technology



Metrological structure Saudi Arabia



-  Traceability
-  Saudi legal Metrology Authority
-  KACST SSDL
-  KFSH&RC SSDL
-  Saudi Accreditation Body
-  National Metrology Institute (SASO)



Metrological structure Kuwait



Traceability



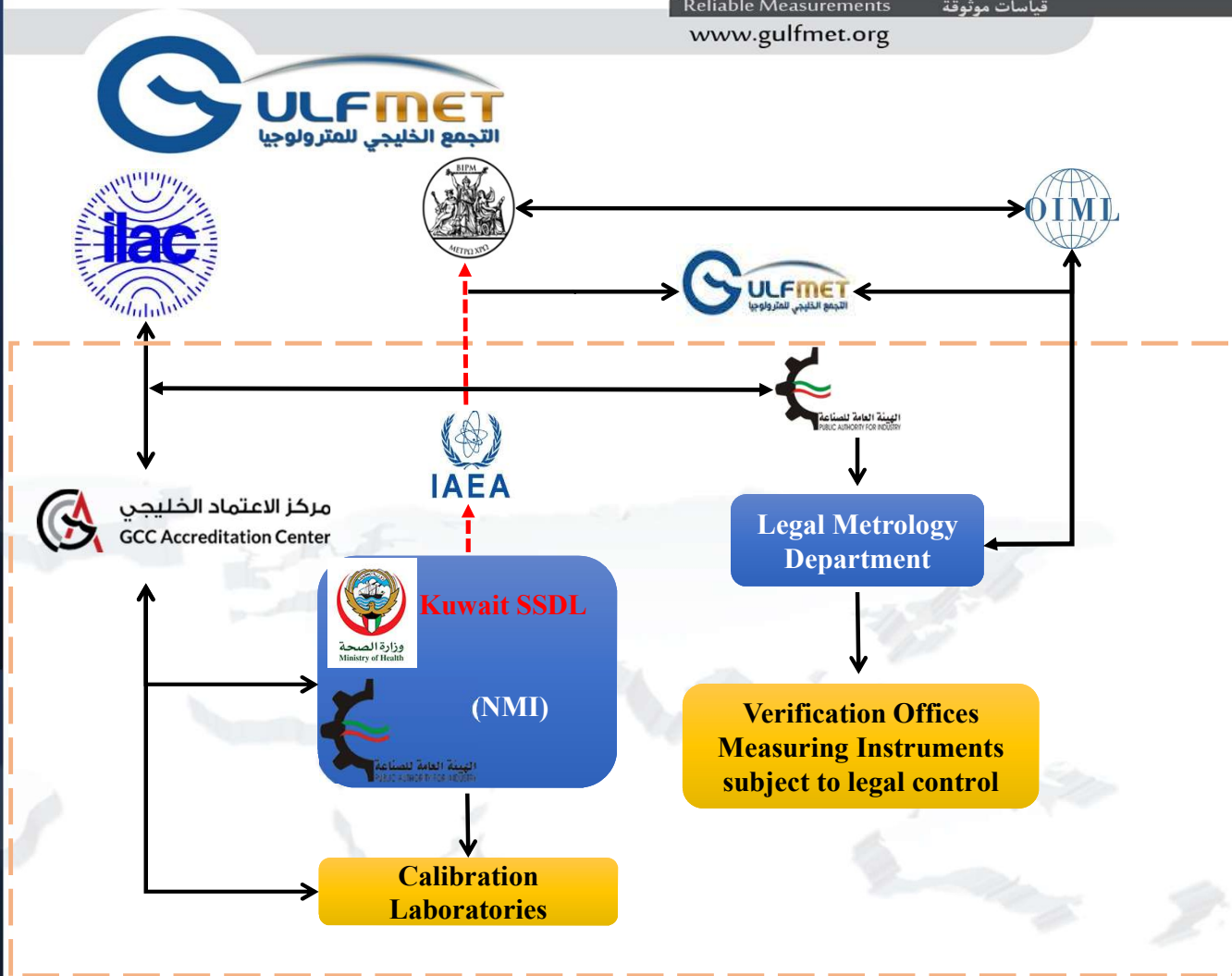
Public Authority For Industry



Ministry of Health – Kuwait SSDL



Gulf Accreditation Body



Technical Capabilities



Reliable Measurements

قياسات موثوقة

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Tech. Capability	UAE FANR SSDL	KSA KFSHRC SSDL	KSA KACST SSDL	Kuwait MOH SSDL
Calibration in Radiation Protection field (Gamma) ISO 4037	✓	✓	✓	✓
Calibration in Radiation Protection field (X-ray Ns) ISO 4037	✓	✓	✓	✓
Calibration in Neutron measurement field	In progress	✓	In progress	-
Calibration of contamination meters (Alpha and Beta)	-	✓	-	-
Calibration in Diagnostic Radiology (RQR and RQA)	✓	✓	✓	In progress
Calibration in Diagnostic Radiology (RQT and RQR-M)	-	✓	-	-
Calibration in Radiotherapy (W_D in Co-60)	-	✓	-	-
Calibration in HDR Brachytherapy	-	✓	-	-
Calibration in Contact-Therapy k_{air} X-ray (CCRI T1 to T4 and T1 beam qualities)	-	✓	-	-
Reference irradiation in term of K_{air} , $H^*(10)$, $H_p(10)$, $H_p(0.07)$ and $H_p(3)$	✓	✓	✓	✓

Technical Capabilities

UAE



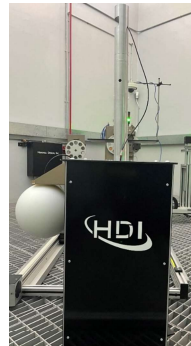
One irradiation room (9x8x8m) equipped with



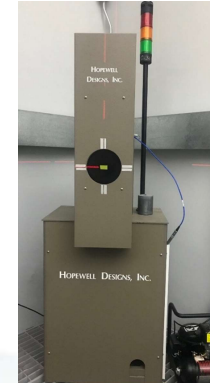
Reliable Measurements

قياسات موثوقة

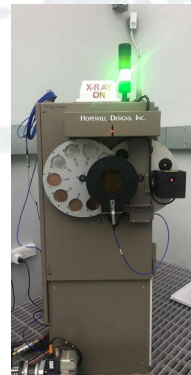
www.gulfmet.org



Neutron Irradiator
 $^{241}\text{Am} - \text{Be}$, 185 GBq



Gamma Beam Irradiator
 ^{137}Cs , 820 GBq



X-ray irradiator X80-320 A Model (N-series, RQR, RQA)



Panoramic Irradiator
 ^{137}Cs , 470 MBq

Technical Capabilities Saudi Arabia



Gamma irradiators with 06 ^{137}Cs and 01 ^{60}Co sources (two reference chambers)



Therapy unit with 5 kCi ^{60}Co source (03 ref. chambers and 04 electrom.)



Contamination (07 α & β Reference sources)



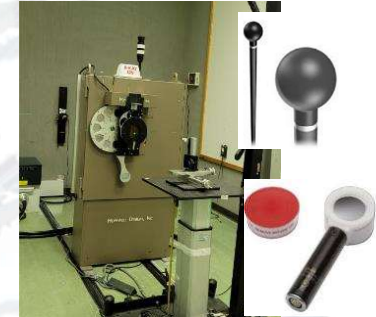
Neutron irradiator with a 3 Ci AmBe source (2 reference detectors)



Brachytherapy unit ^{192}Ir source (01 ref. chambers and 01 electrom.)



Dual X-Ray System (RP, DR & RTH) (05 reference standards)



Technical Capabilities Saudi Arabia



Reliable Measurements

قياسات موثوقة

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Gamma radiation unit 320 kV X-rays Unit



Control room

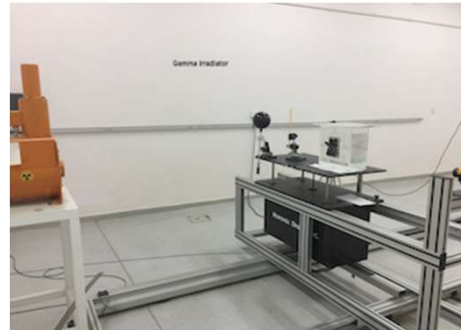


Neutrons Unit



Control room

Technical Capabilities Kuwait



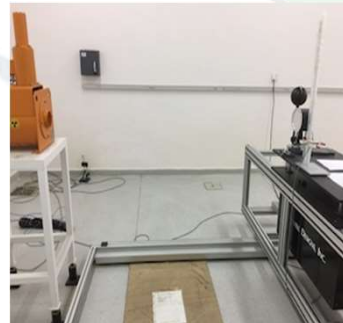
Gamma Irradiator Cs137 (740 GBq)/
20 Ci , 2003 installation, Model OB 6,
STS-GmbH manufacture + Reference
Standard chamber LS01/ PTW 32002,
water slap phantom for personal
dosimeters irradiation



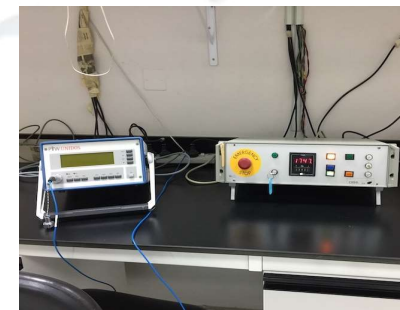
X-ray Irradiator (Narrow Beam),
(40 – 225 kV) ,



Control room of X-ray Irradiator
(Narrow Beam)



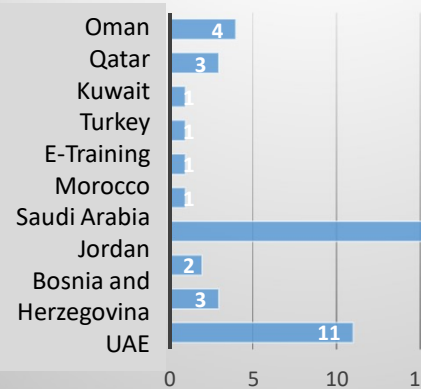
Reference & working, NE2575 chambers,
Calibrated according the Reference
Standard



GULFMET TC IR Activities: Trainings 2021



GULFMET TC IR ISO/IEC 17025 :2017 training Course 2-3 November 2021



- 53 participants joined the course
- BIPM E-Learning platform



GULFMET TC IR is pleased to invite you to participate in
Ionizing Radiation training course

نظم إدارة الجودة في مختبرات الاشعاعات المؤينة بناء على متطلبات
المواصفة الدولية ISO / IEC 17025:2017
Ionizing Radiation Laboratories and Quality Management System based on
ISO / IEC 17025:2017 standard

المتحدثين Speakers



Dr. Arib Mehanna
GULFMET TC IR Member
Head of Secondary Standard Dosimetry Laboratory
King Fahad Special Hospital and Research Center,
Saudi Arabia
Country: Saudi Arabia



Mrs. Samia Mohamed
GULFMET TC IR Chair
SSDL Specialist/ Federal Authority
for Nuclear Regulation (FANR)
in UAE

02 نوفمبر 2021
02 November 2021

UTC+3 13:00 - 10:00

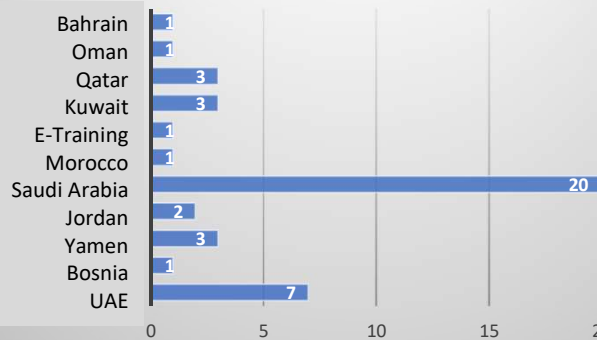
لغة الدورة : الإنجليزية
Course language: English

عن بعد Online

GULFMET TC IR Activities: Trainings 2021



ISO 4037:2019 Radiological Protection reference Fields for calibrating dosimeters based on ISO 4037:2019



- 43 participants joined the course
- BIPM E-Learning platform



GULFMET TC IR is pleased to invite you to participate in
Ionizing Radiation training course

الحماية من الاشعاعات المؤينة : المجالات المرجعية لمعايرة أجهزة قياس الجرعات
وفق المواصفة الدولية القياسية ISO 4037:2019

Radiological protection reference fields for calibrating dosimeters based on ISO 4037:2019

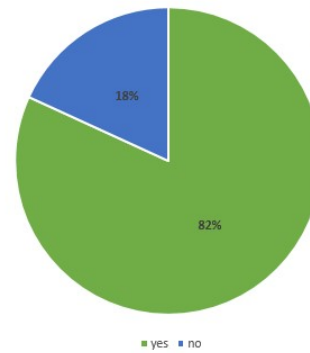
المحدثين Speakers		التاريخ Date
 Dr. Arib Mehenna GULFMET TC IR Member Head of Secondary Standard Dosimetry Laboratory King Fahad Specialist Hospital and Research Centre, Dammam, Saudi Arabia Country: Saudi Arabia	 Mrs. Samia Mohamed GULFMET TC IR Chair SQS, Specialist Federal Authority for Nuclear Regulation (FANR) in UAE	17-16 نوفمبر 2021 16-17 November 2021
		UTC+3 13:00 - 10:00
		لغة الدورة: الإنجليزية Course language: English
		عن بعد Online

GULFMET TC IR Activities: Trainings Feedback



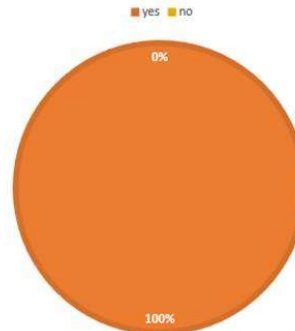
1. Was the course schedule sufficiently planned (duration, time of the course, etc.)

11 Participants review/53 attended (21%)

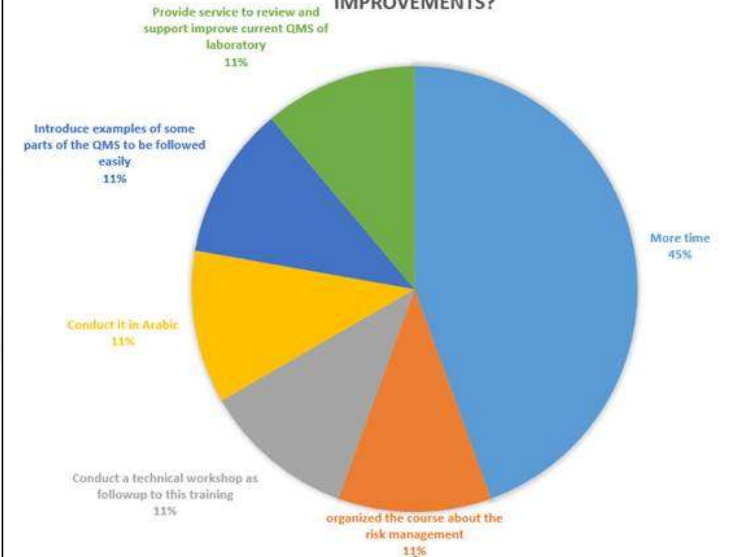


WERE THE INSTRUCTOR ABLE TO PROVIDE YOU WITH DESIRABLE TRAINING OBJECTIVE?

11 Participants review/53 attended (21%)



3. CAN YOU SHARE YOUR SUGGESTIONS AND COMMENTS FOR FUTURE IMPROVEMENTS?





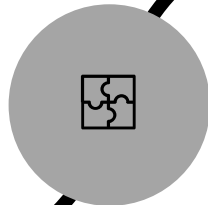
START
June 2022



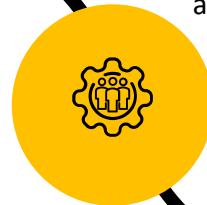
4 Workshops on Basic
knowledge of CIPM MRA



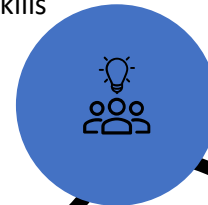
5 comprehensive
workshops of ISO/IEC
17025 QMS



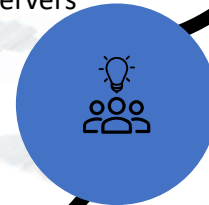
3 workshops on required
Peer review skills and
techniques



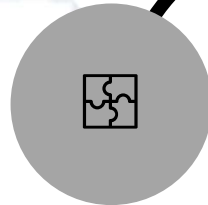
Workshop in
Management, planning
and reporting skills



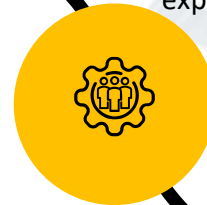
Provide practical
experience as observers



END
January
2023



Continuing professional
development



GULFMET Trainings 2022 Peer Reviewers Qualification Scheme

GULFMET TC IR Activities: Trainings 2023

Reliable Measurements

قياسات موثوقة

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Training Program البرنامج التدريبي

المترولوجيا في الاشعاع المؤين: قياس ومعايرة النيوترونات والتلوث
الاشعاعي وفق متطلبات المواصفات القياسية الدولية
ISO 8769 و ISO 8529

Metrology in ionizing radiation: measurement and
calibration of neutrons and radioactive contamination
according to the requirements of International
Standards ISO 8529 and ISO 8769

عن بعد Online



08-10 May 2023



للتسجيل For Registration
www.gso.org.sa/tr



09:30 - 13:00



www.GSO.org.sa
013 6502001



- **Speakers** from Academic Institutes and Universities in Taiwan.

GULFMET TC IR Ongoing Inter- Laboratory Comparisons



- ❑ **Two** Inter-Laboratory comparisons scheduled in 2022
- 1. **GULFMET.RI(I)-K5: Ongoing – Measurement Phase**
 - Key Comparison For Radiation Protection Calibration Field in Air Kerma For Cs-137 Gamma Reference field
 - Eight laboratories participating (KSA, UAE, Jordon, PTB, Turkey, Republic of Uzbekistan, Bosnia and Herzegovina, and Kuwait)
 - Pilot Lab is KFSHRC in KSA and Link Lab is PTB
 - KSA, FANR, JAEC, PTB and Turkey completed the measurement.
- 2. **GULFMET.RI(I)-S1: Ongoing – Measurement Phase**
 - Supplementary Comparison For Radiation Protection Calibration Field in Air Kerma For X-Ray ISO 4037:2019 N-Series Qualities
 - Eight laboratories participating (KSA, UAE, Jordon, PTB, Turkey, Republic of Uzbekistan, Bosnia and Herzegovina, and Kuwait)
 - Pilot Lab is KFSHRC in KSA and Link Lab is PTB.
 - KSA, FANR, JAEC, PTB and Turkey completed the measurement.

Delay in artifact shipment by 3 months due to changing the shipment company. And Customs clearance. Will be shipped to Next participant by Next week.

GULFMET TC IR Planned Inter- Laboratory Comparisons



- ❑ **One** Inter-Laboratory comparisons Planned in 2023
- 1. **GULFMET.RI(I)-S2: protocol successfully registered in KCDB**
 - Supplementary Comparison For Diagnostic Radiology in Air Kerma For X-Ray RQR and RQA and RQT Beam Qualities
 - Eight laboratories participating (KSA, UAE, Kuwait, Turkey, Republic of Uzbekistan, Bosnia and Herzegovina, Jordan and PTB)
 - Pilot Lab is KFSHRC in KSA and Link Lab is PTB
 - Measurement phase started in May 2023 with KSA as per the plan
 - Planned to be done in 2022, but postponed to 2023 as participants are not yet ready

GULFMET TC IR Designated Institutes



- FANR in UAE is the Only DI for IR in GULFMET so far.
- Two Labs from KSA are requesting to be nominated as DI for Radiation Protection (KACST) and Medical (KFSHRC).
- KSA KFSHRC got the ISO 9001 certification in 2023 and ongoing for ISO 17025.
- KACST ongoing ISO17025 accreditation.
- Members and observers of GULFMET are members of the IAEA/WHO Network

GULFMET TC IR CMCs



- ❑ No CMCs has been established until now from GULFMET TC IR in BIPM KCDB.
- ❑ UAE SSDL and KSA KFSHRC have achieved successfully the bilateral comparison with IAEA to support claiming CMCs.
- ❑ UAE SSDL has finalized the External Audit from Accreditation body and successfully achieved the approval from GULFMET TC QS. The QMS certificate will be released soon.
- ❑ Next step would be claiming CMCs in Dosimetry for UAE FANR SSDL.

GULFMET TC IR Roadmap



- **2022:**
 - Register TC IR members as NMI or DI in BIPM (UAE SSDL).
 - Agreement with IAEA to support GUFLEMT TC IR Action plan (Done).
- **2023:**
 - Approved QMS through peer review or accreditation body (UAE).
 - Successful completion of GULFMET TC IR inter-comparisons as technical evidence.
 - Submit CMCs in IR Dosimetry (Radiation Protection and Diagnostic Field) (in process).
 - Establish Neutron measurement calibration by 2023.
- **2024:**
 - Propose GULFMET Supplementary comparison in Neutron H*(10).
 - Participate in on-going CCRI(III)-S2 supplementary comparison, on neutron Hp(10) (if available).
 - Extend QMS scope to include Neutron measurements.
 - Establish the calibration service of Surface Contamination.
- **2025-2026:**
 - Establish Radiotherapy Field.
 - Propose/participate inter-comparison in Radiotherapy field.
 - Propose/participate inter-comparison in Surface Contamination.



THANK YOU FOR ATTENTION



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