European Commission

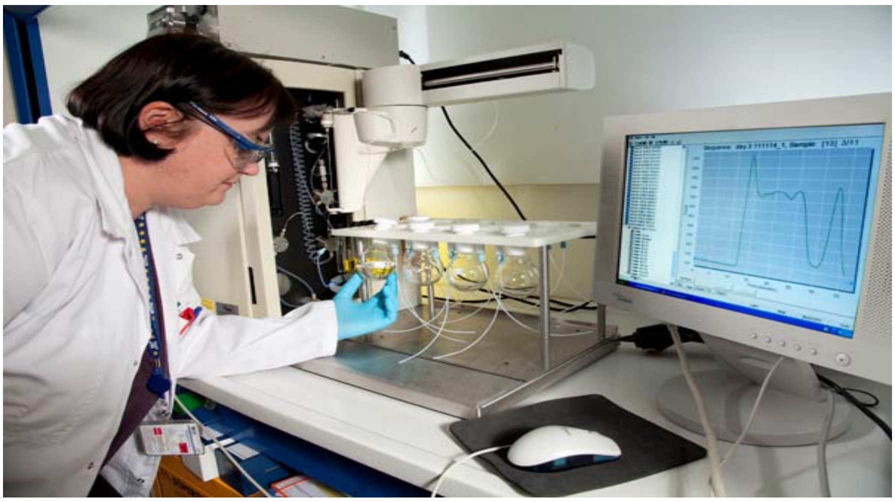
JRC SCIENTIFIC AND POLICY REPORTS

Programme of pre-accession assistance "Improving Chemical and Ionising Radiation Metrology" in Turkey

Fourth interim report
EMIT I - Turkey
Project No TR080209

Josephine McCourt

2012



Report EUR 25337 EN

TÜBİTAK UME

TAEK

Joint Research Centre

European Commission
Joint Research Centre
Institute for Reference Materials and Measurements

Contact information
Josephine McCourt
Address: Joint Research Centre, Retieseweg 111, 2440 Geel, Belgium
E-mail: josephine.mccourt@ec.europa.eu
Tel.: +32 (0)14 571 254
Fax: +32 (0)14 571 862

http://irmm.jrc.ec.europa.eu/
http://www.jrc.ec.europa.eu/

JRC70957

EUR 25337 EN

ISBN 978-92-79-24987-7

ISSN 1018-5593

doi:10.2787/6068

Luxembourg: Publications Office of the European Union, 2012

Printed in Belgium

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	2ND INTERIM	01.07.2010 to 31.12.2010	30.11.2010	31.12.2010*
	3RD INTERIM	01.01.2011 to 30.06.2011	31.05.2011	30.06.2011*
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FINAL		01.07.2012 to 30.09.2012	30.09.2012	30.11.2012*

* Final publication dates of reports depend on many variables, so dates are only indicative.

LIST OF ABBREVIATIONS

ABBREVIATION	NAME IN FULL
ÇNAEM	Turkish Atomic Energy Authority, Çekmece Nuclear Research and Training Centre
EMIT	Europe and Metrology in Turkey
HPLC	High Performance Liquid Chromatography
ICPMS	Inductively Coupled Plasma Mass Spectrometry
IM	Isotope Measurements Unit of IRMM
IRMM	Institute for Reference Materials and Measurements
JRC	Joint Research Centre
LSC	Liquid Scintillation Counting
NMI	National Metrology Institute
PAC	Project Advisory Committee
RM	Reference Materials Unit of IRMM
RN	Radionuclide Metrology Sector of IRMM
SANAEM	Turkish Atomic Energy Authority, Sarayköy Nuclear Research and Training Centre
SC	(Project) Steering Committee
STGG	(Project) Scientific and Technical Guidance Group
TAEK	Turkish Atomic Energy Authority
TÜBİTAK	Scientific and Technological Research Council of Turkey
UME	Scientific and Technological Research Council of Turkey , National Metrology Institute
VERMI	Virtual European Radionuclide Metrology Institute

PROJECT SYNOPSIS

PROGRAMME	EMIT I - TURKEY
Project title	"Improving Chemical and Ionising Radiation Metrology" in Turkey
Project number	TR 080209
Overall objective	The overall objective of the project is to contribute to the better functioning of the EU-Turkey Customs Union Agreement regarding the free movement of goods as well as to facilitate the implementation of *acquis communautaire* in quality of life related areas such as environmental, health and consumer protection and food safety.
Specific Objectives	The main purpose of this arrangement is to enhance institutional and measurement capacity in chemical and ionising radiation metrology to ensure that Turkish laboratories are able to produce traceable and comparable measurement results, leading to improvements in quality of life, and facilitating the adoption of the *acquis* related to the free movement of goods. ▪ improving institutional capacities of beneficiaries ▪ ensuring knowledge transfer in chemical and ionising radiation metrology ▪ further developing human resources at laboratories and at academia in Turkey ▪ strengthening networking and raising awareness.
Planned Outputs	**<u>Component 1: Institutional Capacity Building for TÜBİTAK UME (CB-TU)</u>** ▪ New metrological capabilities/services in the field of chemical metrology developed and supported by documented and implemented strategies ▪ UME quality system integrated with elements of a management system developed according to ISO Guide 34 ▪ TÜBİTAK UME chemistry laboratories advanced in their preparation for accreditation according to ISO Guide 34 as producer and supplier of CRMs to the PT providers ▪ New calibration and measurement capabilities to support the implementation of the *acquis* are ready for submission to the CIPM MRA CMC database. **<u>Component 2: Institutional Capacity Building for TAEK (CB-TA)</u>** ▪ New metrological capabilities/services in the field of ionising radiation metrology developed and supported by documented and implemented plans and programmes ▪ Secondary level standardisation procedures developed or improved ▪ TAEK institutes quality management systems extended and covering the new metrological services ▪ New calibration and measurement capabilities to support the implementation of the *acquis* are ready to submission to the CIPM MRA CMC database ▪ Preparation on the development of primary standardisation initiated and foreseen in TAEK institutes' strategies. **<u>Component 3: Knowledge transfer and human resources development (KT&HR)</u>** ▪ TÜBİTAK UME and TAEK researchers familiar with functioning of metrology systems in EU Member States with similar economic needs

	▪ TÜBİTAK UME and TAEK researchers skilled and ready to carry out the new metrological services ▪ Turkish laboratories' experts knowledgeable how to consider metrological aspects in their activities ▪ Interested Turkish universities familiar with the alignment of EU university programmes in measurement science with Bologna requirements ▪ Turkish universities interested in joining Euromaster Joint Degree Programme in measurement science conform to requirements. **<u>Component 4: Networking and raising awareness (NWA)</u>** ▪ European national metrology institutes (NMIs) familiarized with the development of TÜBİTAK UME and TAEK's capabilities ▪ Network of contacts in the field of metrology established, strengthened and operational ▪ Network of contacts with universities established and strengthened ▪ Chemical and ionising radiation metrology topics discussed with national experts and stakeholders ▪ International metrology community informed about TÜBİTAK UME and TAEK capabilities.
Activity fields (and deliverables) during the implementation phase.	**<u>Component 1: Institutional Capacity Building TÜBİTAK UME (CB-TU)</u>** 1. IRMM to advise TÜBİTAK UME on their strategic plan for the production and certification of reference materials. 2. IRMM to provide consultation to TÜBİTAK UME on the development of procedures and management systems according to ISO Guide 34 and on their integration into the TÜBİTAK UME quality system. 3. IRMM to advise TÜBİTAK UME on the preparation of their chemistry laboratories as CRM producer and international comparisons provider in selected areas. 4. IRMM to provide recommendations on the necessary improvement of clean and climatic rooms at TÜBİTAK UME 5. IRMM to provide consultation to TÜBİTAK UME on the needed equipment and technical specifications for the equipment for the production of CRMs. **<u>Component 2: Institutional Capacity Building for TAEK (CB-TA)</u>** 6. IRMM to advise TAEK on their strategic plan for improving the capabilities for secondary standardisation at TAEK institutes. 7. IRMM to provide consultation to TAEK on the development/improvement of their secondary level standardisation procedures. 8. IRMM to provide consultation on the extension of the current quality management systems at TAEK institutes to the secondary level standardisation activities and support for preparation for participation in the CIPM MRA. 9. IRMM to advise TAEK on their strategic plan for the development of primary standardisation. **<u>Component 3: Knowledge transfer and human resources development (KT&HR)</u>** 10. IRMM to help familiarize TÜBİTAK UME and TAEK researchers with the functioning of metrology systems in EU member states with similar economic needs. 11. IRMM to organize short term and long term trainings for TÜBİTAK UME and TAEK researchers (18 * 1 yr LTTs).

	12. IRMM to organize seminars and workshops for the end users. 13. IRMM to help familiarize Turkish universities providing education in chemical and (if any) in ionising radiation metrology with the status of alignment of EU university programmes in measurement science with the Bologna requirements. 14. IRMM to provide consultation to Turkish universities interested in joining Euromaster Joint Degree Programme in measurement science. **<u>Component 4: Networking and raising awareness (NW & RA)</u>** 15. IRMM to help promote TÜBİTAK UME and TAEK amongst the scientific and metrological community at European level 16. IRMM to help establish a network of direct and indirect users of CRMs and metrology services. 17. IRMM to help establish a network of universities providing (or interested in providing) a master level university education in chemical and ionising radiation metrology. 18. IRMM to organize national conference sessions and events. 19. IRMM will support the participation of TÜBİTAK UME and TAEK experts in international events.
Activity fields during the final phase.	20. The consultant (IRMM) and the contracting authority (EC Delegation, Ankara) will organise a final wrap-up event in order to present the final results of the project and to underline the impact of the IPA programme on the involved institutions and a broader public.
Project starting date	01.10.2009
Project duration	36 months

EXECUTIVE SUMMARY

The overall objective of the project is to contribute to the better functioning of the EU-Turkey Customs Union Agreement regarding the free movement of goods as well as to facilitate the implementation of the *acquis communautaire* in quality of life related areas such as environmental, health and consumer protection and food safety.

To achieve this goal the project consists of an inception phase (complete since 31.12.2009) and 4 components, which are associated with certain interventions, during the implementation phase (01.01.2010 to 30.06.2012) with the project being consolidated during the final phase (01.07.2012 to 30.09.2012).

- Inception phase:
  - Establishment of the project office at UME
  - Identification of stakeholders in order to ensure awareness
  - Meetings with all relevant institutions to ensure awareness and confirm support
  - Contacts with other project teams
  - Gaps and needs analysis at UME, ÇNAEM and SANAEM
  - Planning of activities to be carried out

- Implementation Phase - Component 1: Institutional Capacity Building for TÜBİTAK-UME
  - Identification of requirements for production and certification of reference materials for country-specific products
  - Development of procedures and ISO Guide 34 management system, integration into quality system
  - Preparation of chemistry laboratories for CRM production and provision of international comparisons
  - Consulting on equipment needed for CRM production

- Implementation Phase - Component 2: Institutional Capacity Building for TAEK
  - Identification of requirements and consulting for secondary standardisation at TAEK institutes
  - Extension of the quality management systems at TAEK institutes to secondary level standardisation activities and support for preparation for participation in the CIPM MRA
  - Planning of the development of primary standardisation

- Implementation Phase - Component 3: Knowledge transfer and human resources development
  - Familiarizing UME and TAEK researchers with metrology systems in EU member states with similar economic needs
  - Training for UME and TAEK researchers in matters of CRM, secondary standardisation and applicable quality systems
  - Organization of seminars and workshops for end users
  - Co-operation with Turkish universities providing education in chemical and in ionising radiation metrology
  - Consulting to Turkish universities interested in joining Euromaster Joint Degree Programme in metrology

- Implementation Phase - Component 4: Networking and Raising Awareness
  - Promotion of UME and TAEK among scientific and metrological community at European level
  - Enhancement of relationships with direct and indirect users of CRM and metrology services
  - Enhancement of relationships with universities providing a master level education in measurement science
  - Organization of national conferences and events
  - Support of UME and TAEK experts participation in international events.

- Final Phase

During the last phase of the project, a final wrap-up event in order to present the final results of the project will be held. The aim of this is to underline the impact of the IPA programme on the involved institutions and on the broader public. Invitees to this event should include representatives from all beneficiary institutions, other relevant ministries and state administrative bodies, the academic and legal professions, the business community, NGOs and members of the international donor community. Furthermore, the media should be encouraged to cover the event in order to ensure publicity.

This 4th interim report provides the overview on the project's progress for the duration of the fourth six months of the implementation period. It also offers a plan for the activities to be conducted within the fifth reporting period.

The "Logical Framework" tables (see section 6.1) summarise the status of the project to date in terms of completion of it's objectives. However many of the objectives are split between the consultant having to deliver advice and training (to put it very simply) and the beneficiary (either TÜBİTAK UME, TAEK-CNAEM, TAEK-SANAEM) having to demonstrate that they have used this successfully to reach the stated goals). Seeing as we won't see for some time yet, the overall picture of the "total" objectives having been reached, the completion rate of the activities with respect to IRMM's duty is shown in Figure 1 for each objective.

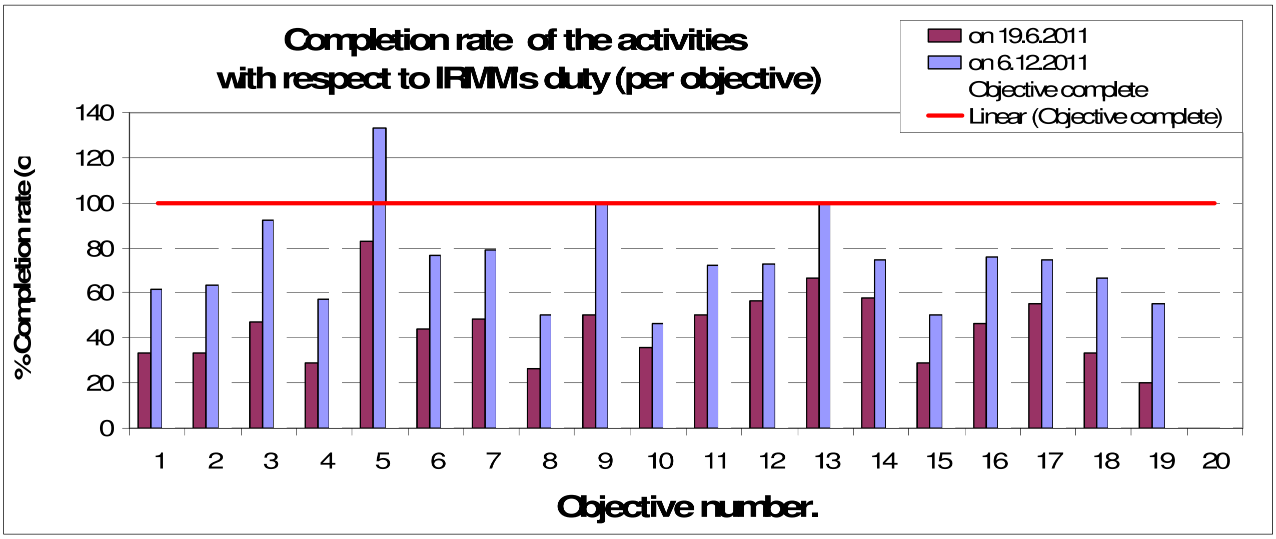


Figure 1: Completion rate of the activities with respect to IRMM's duty regarding each objective.

A summary of the long term training status of the TÜBİTAK UME, TAEK-CNAEM and TAEK-SANAEM traineeships is best represented graphically (see Figure 2).

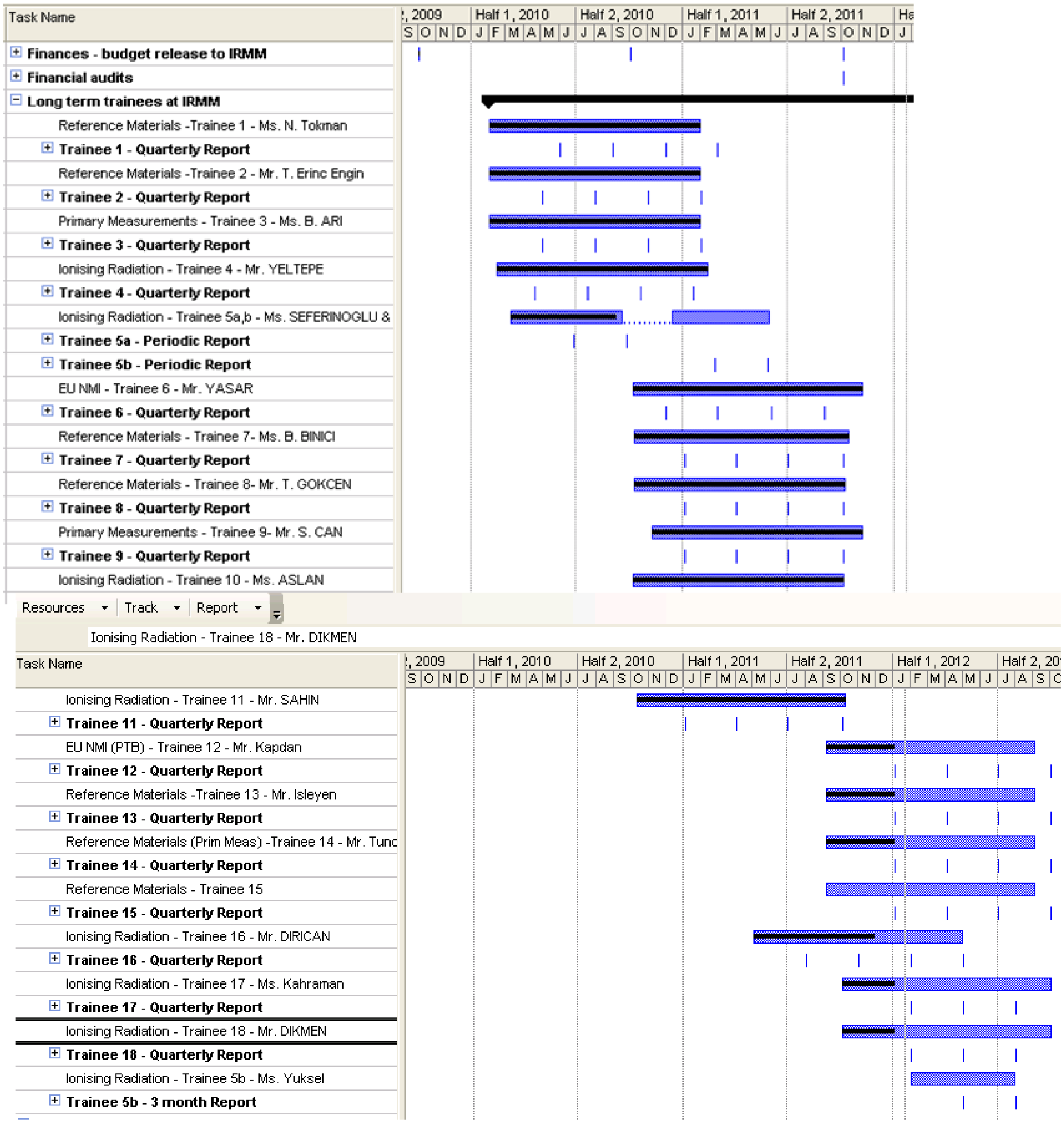


Figure 2: The long term training status (on 31.12.2011) of the TÜBİTAK UME, TAEK-CNAEM and TAEK-SANAEM traineeships.

A summary of the short term event status at the end of the fourth interim period is represented by Figure 3. Short term events comprise of conference sessions, conference participation for TÜBİTAK UME and TAEK scientists, project management meetings (Steering Committee and Project Advisory Committee); study visits / technical advice visits; university outreach / knowledge dissemination seminar lectures and finally workshops.

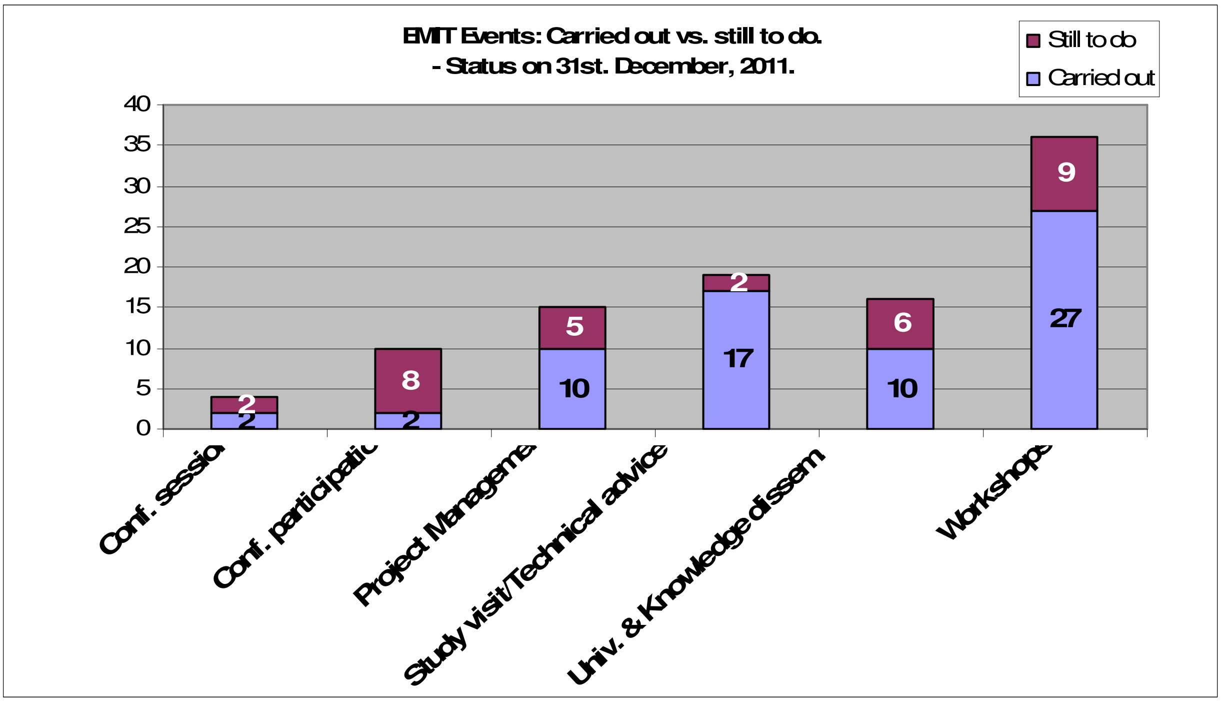


Figure 3: The short term event status at the end of the fourth interim period.

To gain an insight into how the training workshops are being perceived across the scientific community in Turkey, evaluation forms are handed out to the participants. Unfortunately, it is very difficult to get 100% feedback. This varies with every workshop[1]. Table 1 shows the appreciation of Turkish scientists for the workshops provided (primarily by IRMM staff and also some external experts) to date. The number of Turkish scientists who participated in training events (all types, not just the workshops listed below) is 337 in the fourth interim period and over 1850 since the beginning.

Table 1: EMIT workshop appreciation by participants (%).

Workshop tally to date	Workshop code	Workshop title	Nr external participants (varying restrictions on nr allowed).	Training course evaluations on "objectives (being met) and theme" (%)	
				Very good	Good
4	S03-01, -02, -06 and -12.	VERMI 5 (Primary standardisation techniques in radionuclide metrology; Gamma ray spectrometry; Liquid scintillation, Ion chambers and radionuclide calibrators).	48	42	58
5	S01-01	Use of certified reference materials and the estimation of measurement uncertainty.	39	81	19
6	S03-17	Radiochemical lab practice.	5	100	
7	S03-18	Therapy level dosimetry.	120	*Not requested*	

[1] The original individual evaluation sheets are available to the Project Steering Committee and the IRMM EMIT S&T guidance group, via the secure circa platform "JRC Metrology in Turkey".

Workshop tally to date	Workshop code	Workshop title	Nr external participants (varying restrictions on nr allowed).	Training course evaluations on "objectives (being met) and theme" (%)	
				Very good	Good
8	S01-02	Processing of certified reference materials.	33	32	60
9	S04-03	Roadmap for facilitating educational innovations in Metrology in Chemistry and Ionising Radiation	38	8	62
15	S04-04_09	Sampling, Metrology in Chemistry, Internal QC, Applied Statistics, Method optimisation, Selection and use of RMs, Inter Laboratory comparisons….	55	19	56
16	S01-03	Certification of reference materials	35	21	79
17	S02-01	Primary method measurements and uncertainty, method validation (IDMS perspective), accreditation (flexible scope), innovations in ICP-MS….	21	60	40
18	S04-14	Safety of food & feed – requirements of an analytical laboratory.	106	56	41
19	S04-13	Metrology in Nanotechnology	36	43.5	43.5
20	S03-10	Sample preparation and instrument efficiency calibration in liquid scintillation counting.	17	88	12
21	S03-25	Contamination survey meter calibration.	5	40	60
22	S03-27	QA/QC for therapy and diagnostic irradiation systems.	71	41.5	41.5
23	S03-05	Advanced Gamma-ray spectrometry, 1 - True/Chance coincidence correction methods.	20	67	33
24	S01-04	USE of certified reference materials	29	31	65
25	S01-10	Planning, Preparation and Certification of reference materials	20	15	69
26	S01-05	Preparation of reference materials	19	50	44
27	S04-02	Integrated Quality Systems: an interpretation for universities	43	36	61

1 INTRODUCTION

Context:

The IPA-Project TR080209 "Improving Chemical and Ionising Radiation Metrology" under the National Programme for Turkey under the IPA-Transition Assistance and Institution Building Component for 2008 is based on the Administrative Arrangement IPA/2009/214672 – JRC - 31331 between DG Enlargement and the Joint Research Centre, signed on 24th July, 2009. The project synonym is EMIT meaning "Europe and Metrology in Turkey".

The contracting authority for the project acting on behalf of DG ELARG is the Delegation of the European Commission to Turkey, Ugur Mumcu Cad. No: 88/4, Gaziosmanpasa 06700, Ankara, Turkey.

The overall objective of the project is to contribute to the better functioning of the EU-Turkey Customs Union Agreement regarding the free movement of goods as well as to facilitate the implementation of *acquis communautaire* in quality of life related areas such as environmental, health and consumer protection and food safety.

The main purpose of this arrangement is to enhance institutional and measurement capacity in chemical and ionising radiation metrology to ensure that Turkish laboratories are able to produce traceable and comparable measurement results, leading to improvements in quality of life, and facilitating the adoption of the *acquis* related to the free movement of goods.

The Consultant support to EC Delegation Ankara and respectively to DG Enlargement will aim at:

- improving institutional capacities of beneficiaries
- ensuring knowledge transfer in chemical and ionising radiation metrology
- further developing human resources at laboratories and at academia in Turkey
- strengthening networking and raising awareness.

Content:

The Fourth Interim report offers an overview of the *activities conducted during the fourth six months* of the implementation phase (01.07.2011 – 31.12.2011).

Furthermore, this document lists the planned activities for the fifth reporting period (01.01.2012 – 30.06.2012). They are derived from the overall scheduling of the project reported within the Inception Phase report.

Finally, the last chapter is meant to provide a summary of the results achieved in the course of the fourth reporting period, derive conclusions and list the key fields requiring further improvement.

2 IMPLEMENTATION PHASE ACTIVITIES

In line with the initial planning in the inception report, all activities under this project are structured within three **major objectives**:

- Institutional Capacity building (CB) for both TÜBİTAK UME and TAEK,

- Knowledge transfer and human resources development (KT&HR)
- Networking and raising awareness (NW & RA)

Furthermore, each one of them is subdivided into twenty **deliverables** as follows:

TABLE 2: EMIT I DELIVERABLES

Component 1: Institutional Capacity Building TÜBİTAK UME (CB-TU)

i. IRMM to advise TÜBİTAK UME on their strategic plan for the production and certification of reference materials.

ii. IRMM to provide consultation to TÜBİTAK UME on the development of procedures and management systems according to ISO Guide 34 and on their integration into the TÜBİTAK UME quality system.

iii. IRMM to advise TÜBİTAK UME on the preparation of their chemistry laboratories as CRM producer and international comparisons provider in selected areas.

iv.IRMM to provide recommendations on the necessary improvement of clean and climatic rooms at TÜBİTAK UME

v. IRMM to provide consultation to TÜBİTAK UME on the needed equipment and technical specifications for the equipment for the production of CRMs.

Component 2: Institutional Capacity Building for TAEK (CB-TA)

vi.IRMM to advise TAEK on their strategic plan for improving the capabilities for secondary standardisation at TAEK institutes.

vii. IRMM to provide consultation to TAEK on the development/improvement of their secondary level standardisation procedures.

viii. IRMM to provide consultation on the extension of the current quality management systems at TAEK institutes to the secondary level standardisation activities and support for preparation for participation in the CIPM MRA.

ix.IRMM to advise TAEK on their strategic plan for the development of primary standardisation.

Component 3: Knowledge transfer and human resources development (KT&HR)

x. IRMM to help familiarize TÜBİTAK UME and TAEK researchers with the functioning of metrology systems in EU member states with similar economic needs.

xi.IRMM to organize short term and long term trainings for TÜBİTAK UME and TAEK researchers (18 * 1 yr LTTs).

xii. IRMM to organize seminars and workshops for the end users.

xiii. IRMM to help familiarize Turkish universities providing education in chemical and (if any) in ionising radiation metrology with the status of alignment of EU university programmes in measurement science with the Bologna requirements.

xiv. IRMM to provide consultation to Turkish universities interested in joining Euromaster Joint Degree Programme in measurement science.

Component 4: Networking and raising awareness (NW & RA)

xv. IRMM to help promote TÜBİTAK UME and TAEK amongst the scientific and metrological community at European level

xvi. IRMM to help establish a network of direct and indirect users of CRMs and metrology services.

xvii. IRMM to help establish a network of universities providing (or interested in providing) a master level university education in chemical and ionising radiation metrology.

xviii. IRMM to organize national conference sessions and events.

xix. IRMM will support the participation of TÜBİTAK UME and TAEK experts in international events.

Final

xx. The consultant (IRMM) and the contracting authority (EC Delegation, Ankara) will organise a final wrap-up event in order to present the final results of the project and to underline the impact of the IPA programme on the involved institutions and a broader public.

The twenty deliverables (as listed in TABLE 2) will be, for the most part, achieved by carrying out a number of "events" which have been listed in the Inception Phase report (see EMIT I Event List in Annex 6.2). For practical reasons, each event was given a code and can be read as follows: Expert Group 1 Reference Materials events start with S01, Expert Group 2 Primary Methods of Measurement events start with S02, Expert Group 3 Ionising Radiation events start with S03, Expert Group 4 Quality & Metrology education events start with S04 and finally general events start with the code S05.

The "event" list comprises short term training actions, study visits, participations to conferences and organised conference sessions. The only deliverables not covered by a corresponding entry in the "event" list are Long Term Traineeships at IRMM (or NMI) and not all visits of IRMM experts to Turkey. The EMIT Project Management Meetings, such as the Project Advisory Committee and Steering Committee Meetings have also been added to the event list.
The methodology used to achieve EMIT deliverables is summarised in TABLE 3.

TABLE 3: METHODOLOGY USED TO ACHIEVE EMIT DELIVERABLES

METHODOLOGY	DESCRIPTION
A	Long term training (LTT) actions involving 18 trainees (LTTs) at IRMM or NMI (EU)
B	Short term training (STT) actions - to be used by the LTTs and expert speakers disseminating knowledge in TÜBİTAK & TAEK.
C	Study visits to EU member states - meant for Turkish scientists to come to IRMM or to EU NMIs
D	Participations to conferences - meant for Turkish scientists to attend conferences within the scope of EMIT
E	Workshops/seminars (± 20 participants) for UME/TAEK staff
F	Seminars/workshops (50-100 participants) for end-users (national lab staff, university staff, students......)
G	Workshops (20-40 participants) for universities
H	Conference (or session in a conference) - targeting ±400 participants - chemical metrology
I	Conference (or session in a conference) - targeting ±300 participants - ionising radiation metrology
J	Conference (or session in a conference) - targeting ±400 participants - education in metrology
K	Visits of IRMM experts to Turkey (other than code B)
L	Concluding event/conference (300-400 participants)
M	Project Advisory Committee Meetings
N	(Project) Steering Committee Meetings

3 OVERVIEW OF THE ACTIVITIES FOR THE 4TH REPORTING PERIOD 01.07.2011-31.12.2011

The following overview (Table 4) is based on the previously elaborated reporting logic and summarises the results achieved during the 4th reporting period (01.07.2011 to 31.12.2011) :

Table 4: STATUS OF EMIT I DELIVERABLES & RELATED ACTIVITIES AT THE END OF THE 4th INTERIM PERIOD.

Del. Nr.	Deliver-able type	Activity	Method-ology	Status	
				4th Interim completed activities (%)[2]	On-going
1	Capacity Building for TÜBİTAK UME	IRMM to advise TÜBİTAK UME on their strategic plan for the production and certification of reference materials.	A, B, C, E, K, M, N	6 LTTs completed. 62% of objective achieved.	2 LTTS at ≈ 25% of traineeship.
2		IRMM to provide consultation to TÜBİTAK UME on the development of procedures and management systems according to ISO Guide 34 and on their integration into the TÜBİTAK UME quality system.	A, B, C, E, K	6 LTTs completed. 64% of objective achieved.	2 LTTS at ≈ 25% of traineeship.
3		IRMM to advise TÜBİTAK UME on the preparation of their chemistry laboratories as CRM producer and international comparisons provider in selected areas.	A, B, C, E, K	6 LTTs completed. 92% of objective achieved.	2 LTTS at ≈ 25% of traineeship.
4		IRMM to provide recommendations on the necessary improvement of clean and climatic rooms at TÜBİTAK UME	A, K	6 LTTs completed. 57% of objective achieved.	2 LTTS at ≈ 25% of traineeship.
5		IRMM to provide consultation to TÜBİTAK UME on the needed equipment and technical specifications for the equipment for the production of CRMs.	A, B, C, K	6 LTTs completed. 133% of objective achieved.	2 LTTS at ≈ 25% of traineeship.
6	Capacity Building for TAEK	IRMM to advise TAEK on their strategic plan for improving the capabilities for secondary standardisation at TAEK institutes.	A, B, C, E, K	4.5 LTT s completed. 76% of objective achieved.	3 LTTS at ≈ 30% of traineeship, 1 at 60%.
7		IRMM to provide consultation to TAEK on the development/improvement of their secondary level standardisation procedures.	A, B, C, E, K	4.5 LTT s completed. 79% of objective achieved.	3 LTTS at ≈ 30% of traineeship, 1 at 60%.
8		IRMM to provide consultation on the extension of the current quality management systems at TAEK institutes to the secondary level standardisation activities and support for preparation for participation in the CIPM MRA.	A, B, C, E, K	4.5 LTT s completed. 50% of objective achieved.	3 LTTS at ≈ 30% of traineeship, 1 at 60%.

[2] Expressed as percent of total actions necessary to complete the corresponding objective – see Figure 1. Long term traineeships expressed separately.

Del. Nr.	Deliver-able type	Activity	Method-ology	Status: 4th Interim completed activities (%)[2]	Status: On-going
9		IRMM to advise TAEK on their strategic plan for the development of primary standardisation.	A, B, C, E, K	4.5 LTT s completed. 100% of objective achieved.	3 LTTS at ≈ 30% of traineeship, 1 at 60%.
10	Knowledge transfer and human resources development	IRMM to help familiarize TÜBİTAK UME and TAEK researchers with the functioning of metrology systems in EU member states with similar economic needs.	A, B, C, E, K	86% of objective achieved.	
11		IRMM to organize short term and long term trainings for TÜBİTAK UME and TAEK researchers (18 * 1 yr LTTs).	A, B, E	10.5 LTTs at 100% of traineeship, 73% of objective achieved.	5 LTTS at ≈ 25-33% of traineeship, 1 at 60%.
12		IRMM to organize seminars and workshops for the end users.	F	73% of objective achieved.	
13		IRMM to help familiarize Turkish universities providing education in chemical and (if any) in ionising radiation metrology with the status of alignment of EU university programmes in measurement science with the Bologna requirements.	F, K	100% of objective achieved.	
14		IRMM to provide consultation to Turkish universities interested in joining Euromaster Joint Degree Programme in measurement science.	F, K	75% of objective achieved.	
15	Networking and raising awareness	IRMM to help promote TÜBİTAK UME and TAEK amongst the scientific and metrological community at European level	D	48% of objective achieved.	
16		IRMM to help establish a network of direct and indirect users of CRMs and metrology services.	M, N	PAC-05 and SC-06 meetings /seminars 76% of objective achieved.	
17		IRMM to help establish a network of universities providing (or interested in providing) a master level university education in chemical and ionising radiation metrology.	B, D, F, J	75% of objective achieved.	
18		IRMM to organize national conference sessions and events.	H, I, J, L	2 conf. complete 67% of objective achieved.	
19		IRMM will support the participation of TÜBİTAK UME and TAEK experts in international events.	D	56% of objective achieved.	
20	Result communi-cation	The consultant (IRMM) and the contracting authority (EC Delegation, Ankara) will organise a final wrap-up event in order to present the final results of the project.	L	0% of objective achieved.	Agreement on the event date of 11-13 June 2012 has recently been

Del. Nr.	Deliver-able type	Activity	Method-ology	Status	
				4th Interim completed activities (%)[2]	On-going
					achieved.

3.1 DETAILED REPORT ON ACTIVITIES

Based on the overview in Table 4, this section of the 4th Interim report lists the stage of achievement of the agreed activities as well as the expected result. Relevant documents, referred to under interim deliverables, will be provided in the (restricted access) annex.

3.1.1 Component 1: INSTITUTIONAL CAPACITY BUILDING - TÜBİTAK UME (CB-TU)

Component 1: Institutional Capacity Building TÜBİTAK UME (CB-TU)
i. IRMM to advise TÜBİTAK UME on their strategic plan for the production and certification of reference materials.

ACTIVITY	i. IRMM to advise TÜBİTAK UME on their strategic plan for the production and certification of reference materials
Objective of the activity	Clear identification of production capabilities, evaluation methods and parameters to be measured for the production and certification of reference materials to be produced by TÜBİTAK UME for country specific products.
Methodology	A, B, C, E, K, M, N.
Implementation period	01.02.2010 – 30.09.2012
Expected result	A documented strategic plan will be produced by the beneficiary - TÜBİTAK UME - and the Consultant and will be submitted to the Advisory Committee for review and to the Steering Committee for approval.
Deliverables (before project end).	By TÜBİTAK UME and IRMM - A documented strategic plan. Internal approval by TÜBİTAK UME before review by the PAC . By PAC – a review of the strategic plan By SC – approval of the strategic plan.
Hosting institutions	IRMM, TÜBİTAK UME.
Status at the end of the Fourth Interim period of the Implementation Phase.	
Status	TÜBİTAK UME: A draft strategic plan was sent to IRMM for review on the 5th March, 2012. Revisions (on the draft) were received from IRMM on the 13th March. IRMM: 6 LTTS at 100% completion of traineeship; 2 LTTs at 25% completion of traineeship. The completed events which supported the 62% completion rate wrt to IRMM's duty concerning this objective are S01-01, S01-13a,b, S01-02, S01-03, S02-01, S01-04, S01-10 and S01-05 The outstanding planned events which will complete IRMM's duty wrt to this objective are: S01-11, S01– 20, S01 – 19, S01-06, S01-12 and S02-02.
Interim deliverables	TÜBİTAK UME : Draft strategic plan sent to IRMM on 05.03.2012 IRMM: Final reports of 6 LTTS complete. 6 QT1 & 1 QT2 interim reports of another 7 LTTs complete. LTT reports are available via the secure circabc platform which is accessible by

	the EMIT steering committee members Descriptions of the events carried out in the fourth interim are provided in section 3.2.

ii. IRMM to provide consultation to TÜBİTAK UME on the development of procedures and management systems according to ISO Guide 34 and on their integration into the TÜBİTAK UME quality system.

ACTIVITY	ii. IRMM to provide consultation to TÜBİTAK UME on the development of procedures and management systems according to ISO Guide 34 and on their integration into the TÜBİTAK UME quality system.
Objective of the activity	TÜBİTAK UME quality system integrated with a management system developed according to ISO Guides 30-35
Methodology	A, B, C, E, K
Implementation period	01.02.2010 – 30.09.2012
Expected result	Quality principles and good practices shall be taken on board at the very beginning of activities leading to the new TÜBİTAK UME services in the area of reference materials. The definitive, long-term goal is that TÜBİTAK UME is capable of carrying out a CRM project according to ISO Guide 34 so that it is capable of submitting for accreditation assessment the fully developed, operational and management system according to ISO Guide 34.
Deliverables (before project end).	By TÜBİTAK UME : - New or revised quality management procedures - Submitted application for TÜBİTAK UME's accreditation according to ISO Guides 30-35. By IRMM: - Completion of 9 LTT traineeships and completion of the events S01-01, S01-13a,b, S01-02, S01-03, S01-04, S01-10, S01-11, S01-05, S01 – 20, S01 – 19, S01-06 and S01-12
Hosting institutions	IRMM, TÜBİTAK UME.
Status at the end of the Fourth Interim period of the Implementation Phase.	
Status	TÜBİTAK UME: Integration of production and certification of reference material manuals to the already existing TÜBİTAK UME Quality manuals is in progress and about 75% of which has been completed. Similarly, the procedures for the production of reference materials according to relevant guides have already been completed and will be sent to the quality manager for approval, by the end of March. Even though the equipment will not be in place, the instructions for the methods/experiments/instruments are prepared according to the results obtained from feasibility studies. Finalization of the instructions will be completed after having the equipment operational in our laboratories. IRMM: 6 LTTs at 100% completion stage of traineeship; 2 LTTs at 25% completion of traineeship. The completed events which supported the 64% completion rate wrt to IRMM's duty concerning this objective are: S01-01, S01-13a,b, S01-02, S01-03, S01-04, S01-10, and S01-05. The outstanding planned events which will complete IRMM's duty wrt to this objective are S01-11, S01 – 20, S01 – 19, S01-06 and S01-12
Interim deliverables	TÜBİTAK UME: About 75% of the TÜBİTAK UME Quality Manual has been prepared. IRMM: Final reports of 6 LTTS complete. 6 QT1 & 1 QT2 interim reports of another 7 LTTs complete. LTT reports are available via the secure circa platform which is accessible by the EMIT steering committee members Descriptions of the events carried out in the fourth interim are provided in section 3.2.

iii. IRMM to advise TÜBİTAK UME on the preparation of their chemistry laboratories as CRM producer and international comparisons provider in selected areas.

ACTIVITY	iii. IRMM to advise TÜBİTAK UME on the preparation of their chemistry laboratories as CRM producer and international comparisons provider in selected areas.
Objective of the activity	TÜBİTAK UME chemistry laboratories prepared for accreditation as producer and supplier of CRMs to the PT providers; New calibration and measurement capabilities to support the implementation of the *acquis* are ready for submission to the CIPM MRA CMC database.
Methodology	A, B, C, E, K
Implementation period	01.02.2010 – 30.09.2012
Expected result	Improvement of the existing infrastructure will enable proper work of materials processing and analytical measurement equipment and the smooth implementation of the project. Therefore this activity shall deliver results shortly after the beginning of the project and TÜBİTAK UME's progress on the improvement of facilities shall be monitored during the project: - Increased number of TÜBİTAK UME services and CMCs - At least two candidate CRMs from the identified production scope released by UME - Validation of 5 new measurement methods developed in TÜBİTAK UME chemistry laboratories - Submitted to EURAMET minimum 5 CMC entries for inclusion into the CIPM MRA CMC database
Deliverables (before project end).	By TÜBİTAK UME : - Improved facilities; Increased services; New methods; New EURAMET submissions. By IRMM: - Completion of 9 LTT traineeships and events S01-01, S01-13a,b, S01-02, S01-03, S02-01, S01-04, S01-10, S01-11, S01-05, S01 – 20, S01 – 19, S01-14, S01-06, S01-12 and S02-02.
Hosting institutions	IRMM, TÜBİTAK UME.
Status at the end of the Fourth Interim period of the Implementation Phase.	
Status	TÜBİTAK UME: A revision of the equipment list was decided upon, which had to be accompanied by a change in the project fiche (for the Equipment Supply IPA). The revised project fiche was further revised by JRC-IRMM and then sent to and accepted by the CFCU and the EUD Turkey. In the meantime the market research was also revised. Technical specifications were completed and sent to the CFCU. A second revision (also approved by JRC-IRMM) of the technical specifications has already been finalized. The forecast notice was published on the 13th January 2012. The procurement notice is currently being prepared by the CFCU. Further preparations for RM production involved the compilation of three case studies, as requested by IRMM for input to the EMIT S01-10 "Planning, processing and certification of reference materials" workshop (Geel, 20-22nd Sep., 2011). The case studies "Sulphur dioxide in apricot" and "Trace elements in hazelnut" were submitted to JRC-IRMM on the 15.07.2011 and the "Mycotoxin in dried fig" is in the final stages of preparation for submission. The details of these three projects have been discussed in the workshop and thereafter revisions completed by the project teams. Feasibility studies are still in progress. The increased services, new methods and new EURAMET submissions commenced on the return (to TÜBİTAK UME) of the first 3 LTTS (January 2011) with the participation of an ex LTT, Ms. B. Ari in a "Lead in calibration solution" comparison, measured by ID ICP MS. The other two LTTs (Mr. Erinc Engin and Ms. N. Tokman), who have returned,

	have not yet participated in international comparisons because of the unavailable comparisons for these subjects. IRMM: 6 LTTs at 100% completion stage of traineeship; 2 LTTs at 25% completion of traineeship. The completed events which supported the 92% completion rate wrt to IRMM's duty concerning this objective are: S01-01, S01-13a,b, S01-02, S01-03, S02-01, S01-21, S01-18, S02-07a,b , S02-08, S01-04, S01-10 and S01-05. The outstanding planned events which will complete IRMM's duty wrt to this objective are S01-11, S01-20, S01-19, S01-14, S01-06, S01-12 and S02-02.
Interim deliverables	TÜBİTAK UME: The documents for the integration of quality system according to the already existing UME Management system has been facilitated by the LTTs who already returned. Quality handbooks and other documents are prepared by the guidance of LTTs. The feasibility studies are being conducted by the leadership of the (ex) LTTs. IRMM: Final reports of 6 LTTS complete. 6 QT1 & 1 QT2 interim reports of another 7 LTTs complete. LTT reports are available via the secure circabc platform which is accessible by the EMIT steering committee members Descriptions of the events carried out in the fourth interim are provided in section 3.2.

iv. IRMM to provide recommendations on the necessary improvement of clean and climatic rooms at TÜBİTAK UME

ACTIVITY	iv. IRMM to provide recommendations on the necessary improvement of clean and climatic rooms at TÜBİTAK UME
Objective of the activity	Providing recommendations on the necessary improvement of clean and climatic rooms at TÜBİTAK UME
Methodology	A, K
Implementation period	01.02.2010 – 30.09.2012
Expected result	Improvement of the existing infrastructure will enable proper work of materials processing and analytical measurement equipment and the smooth implementation of the project. Therefore this activity shall deliver results shortly after the beginning of the project and TÜBİTAK UME’s progress on the improvement of facilities shall be monitored during the project.
Deliverables (before project end).	By TÜBİTAK UME : - Improved facilities. By IRMM: - Completion of 9 LTT traineeships and events S02-07a,b, S02-01, S01-10, S01-11, S01-05, S01-14 and S02-02.
Hosting institutions	IRMM, TÜBİTAK UME.
Status at the end of the Fourth Interim period of the Implementation Phase.	
Status	TÜBİTAK UME: The construction of the clean room and the climatic rooms cannot start until the finalisation of the tendering procedure. The date foreseen for finalisation is Summer 2012. The ex long term trainees, Ms. B.Ari and Mr. Süleyman Z. Can who were trained in IRMM's ultra clean chemical laboratory (UCCL) have used their new knowledge in the preparation of the technical specifications for the clean areas. The plan for the clean room and the specifications have been prepared mainly by them. The final revisions on the latest version of the plan and the technical specifications were prepared by IRMM (Mr. C. Quetel) on the 29.02.2012. IRMM: 6 LTTs at 100% completion stage of traineeship; 2 LTTs at 25% completion of

	traineeship. The completed events which supported the 57% completion rate wrt to IRMM's duty concerning this objective are: S02-01, S02-07 (a,b), S01-10 and S01-05. The outstanding planned events which will complete IRMM's duty wrt to this objective are S01-11, S01-14 and S02-02.
Interim deliverables	TÜBİTAK UME: Construction to begin after the finalisation of the tendering procedure (Summer 2012). IRMM: Final reports of 6 LTTS complete. 6 QT1 & 1 QT2 interim reports of another 7 LTTs complete. LTT reports are available via the secure circa platform which is accessible by the EMIT steering committee members Descriptions of the events carried out in the fourth interim are provided in section 3.2.

v. IRMM to provide consultation to TÜBİTAK UME on the needed equipment and technical specifications for the equipment for the production of CRMs.

ACTIVITY	v. IRMM to provide consultation to TÜBİTAK UME on the needed equipment and technical specifications for the equipment for the production of CRMs
Objective of the activity	Consultations on the needed equipment and drafting the technical specifications for the equipment for the production of CRMs to be supplied under an IPA 2009 supply project.
Methodology	A, C, K
Implementation period	01.02.2010 – 30.09.2012
Expected result	This is a high priority activity. It will ensure timely launch of a separate IPA project called "Supply of chemical metrology equipment to TÜBİTAK UME" by which needed equipment for material processing and certification will be supplied to TÜBİTAK UME.
Deliverables (before project end).	By TÜBİTAK UME : - Equipment delivered, installed and operational. By IRMM: - Consultation on the needed equipment for both CRM preparation and certification. - Completion of 9 LTT traineeships and events S01-01, S01-13a,b, S01-02, S02-07ab , S01-03 and S01-11
Hosting institutions	IRMM, TÜBİTAK UME.
Status at the end of the Fourth Interim period of the Implementation Phase.	
Status	TÜBİTAK UME: As mentioned in iii (preparation of the chemistry laboratories), a revision of the equipment list was decided upon by UME, which had to be accompanied by a change in the project fiche (for the Equipment Supply IPA). The revised project fiche was further revised by JRC-IRMM and then sent to and accepted by the CFCU and the EUD Turkey. In the meantime the market research was also revised. Technical specifications were completed and sent to the CFCU. A second revision (also approved by JRC-IRMM) of the technical specifications has already been finalized. The forecast notice was published on the 13th January 2012. The procurement notice is currently being prepared by the CFCU. IRMM: 6 LTTs at 100% completion stage of traineeship; 2 LTTs at 25% completion of traineeship. The completed events which supported the 133% completion rate (more advice occasions, than foreseen, were provided) wrt to IRMM's duty concerning this objective are: S01-01, S01-13a,b, S01-02, S02-07a,b and S01-03 as well as the intensive work carried out by Mr. H. Emteborg and Mr. C. Quetel in revising the technical specifications during the months of April and May 2011.

	The outstanding planned event which will complete IRMM's duty wrt to this objective is S01-11.
Interim deliverables	TÜBİTAK UME: On the 25.08.2011 a request to increase the budget by 1 M€ was sent to the MoEU Affairs. On the 19.10.2011 an answer was received from the MoEU Affairs explaining that the budget could not be increased. In the meantime the market research was revised. On the 29.11.2011 a request for a change in the equipment list was sent to the MoEU Affairs, without a budget increase. On the 06.12.2011 the Technical Specifications (for 50 items) were sent to the CFCU. During January and February several revisions were made upon receiving CFCU comments and the most recent Technical Specification revisions were sent on the 23.02.2012. TÜBİTAK UME are currently awaiting a response. IRMM: The final TS revisions were sent to TÜBİTAK UME on the 7th June, 2011. H. Emteborg and J. McCourt advised on the final documents before submission to the CFCU in Dec. 2011. Final reports of 6 LTTS complete. 6 QT1 & 1 QT2 interim reports of another 7 LTTs complete. LTT reports are available via the secure circabc platform which is accessible by the EMIT steering committee members. Descriptions of the events carried out in the fourth interim are provided in section 3.2.

3.1.2 Component 1: INSTITUTIONAL CAPACITY BUILDING - TAEK (CB-TA)

vi. IRMM to advise TAEK on their strategic plan for improving the capabilities for secondary standardisation at TAEK institutes.

ACTIVITY	vi. IRMM to advise TAEK on their strategic plan for improving the capabilities for secondary standardisation at TAEK institutes.
Objective of the activity	Clear identification of the scope and targeted capabilities for secondary standardisation at TAEK institutes.
Methodology	A, B, C, E, K, M, N.
Implementation period	01.11.2009 – 30.09.2012
Expected result	A documented strategic plan will be produced by the beneficiaries - TAEK research centres - and the Consultant and will be submitted to the Advisory Committee for review and to the Steering Committee for approval.
Deliverables (before project end).	By TAEK and IRMM - a documented strategic plan. By PAC – a review of the strategic plan By SC – approval of the strategic plan.
Hosting institutions	IRMM, TAEK
Status at the end of the Fourth Interim period of the Implementation Phase.	
Status	TAEK-SANAEM: A documented strategic plan was prepared and sent to IRMM for review and consultancy. TAEK-ÇNAEM : - Accreditation studies on "Cs-137 and x ray for protection-level dosimetry calibration" will be started in second period of 2012 - The X-ray laboratory of SSDL was not upgraded in 2011, but RQR and RQT energy series have been generated for diagnostic radiology. - Plans have been made to apply for accreditation for two new methods namely "Alpha Spectrometric Analysis of ^{234}U and ^{238}U Radioisotopes in Drinking Water" and "Gross Alpha-Beta Radioactivity Analysis In Drinking Water". IRMM: 4.5 LTTs at 100% completion of traineeship. 3 LTTs at 30% of traineeship and 1 at 60%. The completed events which supported the 76% completion rate wrt to

	IRMM's duty concerning this objective are: S03-02, S03-06, S03-17, S03-29, S03-08, S03-16, S03-07, S03-10, S03-25, S03-27, S03-05 and S03-30. The outstanding planned events which will complete IRMM's duty wrt to this objective are S03-09, S03-13, S03-14_15, S03-20_23, S03-11, S03-03, S03-24, S03-26
Interim deliverables	TAEK-SANAEM: A documented draft strategic plan is complete. TAEK-ÇNAEM: - TURKAK surveillance assessment on “Air kerma calibration at Co-60 beam for Therapy level dosimeters” and “Calibration of absorbed dose to water at Co-60 beam for Therapy level dosimeters” was performed successfully on 19.12.2011 - TURKAK surveillance assessment on "Analysis of tritium in drinking water", "Cs-134 and Cs-137 analysis of foodstuff ", and "Radioactivity analysis of Ra-226, Th-232, K-40 and Cs-137 in the construction materials” will be probably held in June 2012 IRMM: Final reports of 4.5 LTTS complete. 6 QT1 & 1 QT2 interim reports of another 7 LTTs complete. LTT reports are available via the secure circabc platform which is accessible by the EMIT steering committee members Descriptions of the events carried out in the fourth interim are provided in section 3.2.

vii. IRMM to provide consultation to TAEK on the development/improvement of their secondary level standardisation procedures.

ACTIVITY	vii. IRMM to provide consultation to TAEK on the development/improvement of their secondary level standardisation procedures
Objective of the activity	Consultation on the development/improvement of secondary level standardisation procedures.
Methodology	A,B, C, E, K
Implementation period	01.11.2009 – 30.09.2012
Expected result	Improving two radioactivity measurement methods to secondary standard level. Improving two dosimetric measurement methods to secondary standard level
Deliverables (before project end).	By TAEK: - Two improved radioactivity measurement methods to secondary standard level. - Two improved dosimetric measurement methods to secondary standard level. By IRMM: - Completion of 9 LTT traineeships; nearly all S03 activities.
Hosting institutions	IRMM, TAEK
Status at the end of the Fourth Interim period of the Implementation Phase.	
Status	TAEK-SANAEM: Establishment of a Secondary Standardisation Dosimetry Laboratory (SSDL) at SANAEM has been approved by TAEK Headquarters and the State Planning Office. It is in the phase of preparing the projects of the SSDL building and technical specifications of the instruments and devices to be purchased. TAEK-ÇNAEM : - Accreditation studies on “Cs-137 and x ray for protection-level dosimetry calibration” will be started in second period of 2012 - The X-ray laboratory of SSDL was not upgraded in 2011, but RQR and RQT energy series have been generated for diagnostic radiology. - Plans have been made to apply for accreditation for two new methods namely “Alpha Spectrometric Analysis of ^{234}U and ^{238}U Radioisotopes in Drinking Water” and “Gross Alpha-Beta Radioactivity Analysis In Drinking Water”.

	IRMM: 4.5 LTTs at 100% completion of traineeship. 3 LTTs at 30% of traineeship and 1 at 60%. The completed events which supported the 79% completion rate wrt to IRMM's duty concerning this objective are: S03-02, S03-06, S03-12, S03-17, S03-18, S03-29, S03-08, S03-16, S03-07, S03-10, S03-25, S03-27 , S03-05, S03-30 and S03-32. The outstanding planned events which will complete IRMM's duty wrt to this objective are S03-09, S03-13, S03-14_15, S03-20_23, S03-11, S03-03, S03-24, and S03-26.
Interim deliverables	TAEK-SANAEM: The revised accreditation scope for 14 test methods was announced on TURKAK's web page on 29th December 2011. TAEK-ÇNAEM - TURKAK surveillance assessment on "Air kerma calibration at Co-60 beam for Therapy level dosimeters" and "Calibration of absorbed dose to water at Co-60 beam for Therapy level dosimeters" was performed successfully on 19.12.2011 - TURKAK surveillance assessment on "Analysis of tritium in drinking water", "Cs-134 and Cs-137 analysis of foodstuff ", and "Radioactivity analysis of Ra-226, Th-232, K-40 and Cs-137 in the construction materials" will probably be held in June 2012 IRMM: Final reports of 4.5 LTTS complete. 6 QT1 & 1 QT2 interim reports of another 7 LTTs complete. LTT reports are available via the secure circabc platform which is accessible by the EMIT steering committee members Descriptions of the events carried out in the fourth interim are provided in section 3.2.

viii. IRMM to provide consultation on the extension of the current quality management systems at TAEK institutes to the secondary level standardisation activities and support for preparation for participation in the CIPM MRA.

ACTIVITY	viii. IRMM to provide consultation on the extension of the current quality management systems at TAEK institutes to the secondary level standardisation activities and support for preparation for participation in the CIPM MRA.
Objective of the activity	Consultation on the extension of the current quality management systems at TAEK institutes to the secondary level standardisation activities and support for preparation for participation in the CIPM MRA.
Methodology	A,B, C, E, K
Implementation period	01.11.2009 – 30.09.2012
Expected result	Quality principles and good practices shall be taken on board at the very beginning of activities leading to the new TAEK services in the area of ionising radiation metrology. The definitive, long-term goal is that TAEK institutes have fully developed, operational and accredited management system for these services according to ISO/IEC 17025. -Submitted applications for the extension of accreditation of TAEK laboratories according to ISO 17025 -Submitted to EURAMET minimum 4 CMC entries for inclusion into the CIPM MRA CMC database
Deliverables (before project end).	By TAEK: - accreditation extension application - EURAMET submissions By IRMM: - Completion of 9 LTT traineeships; nearly all S03 training events.
Hosting institutions	IRMM, TAEK
Status at the end of the Fourth Interim period of the Implementation Phase.	
Status	TAEK-SANAEM: The CMC's for Cs-137 and K-40 in foodstuff was prepared. The application will be made in March 2012. TAEK-ÇNAEM: - CMC tables have been performed for "Air kerma calibration at Co-60 beam

	for Therapy level dosimeters" and "Calibration of absorbed dose to water at Co-60 beam for Therapy level dosimeters" and sent to Dr. Emin Yeltepe, who is the contact person of TAEK for EUROMET Technical Committee. - A new laboratory will be established for implementation of active compton shielding for background reduction in gamma-ray spectrometry after LTT (Mr. Ayhan YUKSEL) returns. - In order to perform 14C analyses, sample oxidizer has been purchased in 2011 and TOC and benzene synthesis unit will be purchased. IRMM: 4.5 LTTs at 100% completion of traineeship. 3 LTTs at 30% of traineeship and 1 at 60%. The completed events which supported the 50% completion rate wrt to IRMM's duty concerning this objective are: S03-07, S03-10, S03-25, S03-27, S04-03, S03-05, S03-30 and S03-32. The outstanding planned events which will complete IRMM's duty wrt to this objective are S03-09, S03-13, S03-14_15, S03-20_23, S03-11, S03-03, S03-24, and S03-26.
Interim deliverables	TAEK-SANAEM: The supplementary comparison in billberry material was presented in ICRM in Japan in Sep. 2011. IRMM: Final reports of 4.5 LTTS complete. 6 QT1 & 1 QT2 interim reports of another 7 LTTs complete. LTT reports are available via the secure circabc platform which is accessible by the EMIT steering committee members Descriptions of the events carried out in the fourth interim are provided in section 3.2.

ix. IRMM to advise TAEK on their strategic plan for the development of primary standardisation.

ACTIVITY	ix. IRMM to advise TAEK on their strategic plan for the development of primary standardisation
Objective of the activity	Providing written recommendations on development of primary standardisation
Methodology	A, K
Implementation period	01.11.2009 – 30.09.2012
Expected result	Documented strategic recommendations will be produced by beneficiaries - TAEK research centres - and the Consultant and will be submitted to the Advisory Committee for review and to the Steering Committee for approval
Deliverables (before project end).	By TAEK and IRMM - documented strategic recommendations. By PAC – a review of the strategic recommendations By SC – approval of the strategic recommendations
Hosting institutions	IRMM, TAEK
Status at the end of the Fourth Interim period of the Implementation Phase.	
Status	TAEK-SANAEM: Recommendations on primary standardization from IRMM are expected after IRMM's review of the draft strategic plan. TAEK-ÇNAEM: ÇNAEM doesn't have any strategic plan on development of primary standardisation. IRMM: 4.5 LTTs at 100% completion of traineeship. 3 LTTs at 30% of traineeship and 1 at 60%. The completed event which supported the 100% completion rate wrt to IRMM's duty concerning this objective is S03-01 and by means of knowledge transfer via the long term trainees.
Interim deliverables	TAEK-SANAEM: N/A TAEK-ÇNAEM: N/A. IRMM: Final reports of 4.5 LTTS complete. 6 QT1 & 1 QT2 interim reports of another

	7 LTTs complete. LTT reports are available via the secure circabc platform which is accessible by the EMIT steering committee members Descriptions of the events carried out in the fourth interim are provided in section 3.2.

3.1.3 Component 3: Knowledge transfer and human resources development (KT&HR)

x. IRMM to help familiarize TÜBİTAK UME and TAEK researchers with the functioning of metrology systems in EU member states with similar economic needs.

ACTIVITY	x. IRMM to help familiarize TÜBİTAK UME and TAEK researchers with the functioning of metrology systems in EU member states with similar economic needs.
Objective of the activity	Familiarizing TÜBİTAK UME and TAEK researchers with functioning of metrology systems in EU member states with similar economic needs
Methodology	A,B,C,E,K
Implementation period	01.11.2009 – 30.09.2012
Expected result	- 9 study visits to at least 2 EU Member States and prepared mission reports and presentations for each visit
Deliverables (before project end).	By TÜBİTAK UME and TAEK: - Completion of visits. - Associated presentations and mission reports. By IRMM: - Facilitation of all study visits
Hosting institutions	Various (at least 2 EU Member States).
Status at the end of the Fourth Interim period of the Implementation Phase.	
Status	TAEK: TAEK have expressed their needs regarding these study visits. TÜBİTAK UME: Some study visits (of TÜBİTAK UME staff) are being investigated. IRMM: The completed events which supported the 46% completion rate wrt to IRMM's duty concerning this objective are: S03-29, S03-08, S03-16, S02-08, S03-25 and S03-30. The outstanding planned events which will complete IRMM's duty wrt to this objective are S03-09, S03-13, S03-14_15, S01-11, S03-11, S03-24 and S03-26.
Interim deliverables	TAEK: Associated presentations and mission reports to IRMM. TÜBİTAK UME: Associated presentations and mission reports to IRMM. Descriptions of the study visits carried out in the fourth interim are provided in section 3.2.

xi. IRMM to organize short term and long term trainings for TÜBİTAK UME and TAEK researchers (18 * 1 yr LTTs).

ACTIVITY	xi. IRMM to organize short term (51) and long term trainings for TÜBİTAK UME and TAEK researchers (18 * 1 yr LTTs).
Objective of the activity	Organization of consultations and short term and long term trainings for TÜBİTAK UME and TAEK researchers.
Methodology	A, B, E
Implementation period	01.11.2009 – 30.09.2012

Expected result	Short-term training events for TÜBİTAK UME and TAEK researchers Long-term training of TÜBİTAK (TÜBİTAK UME or in justified cases, another TÜBİTAK institute) and TAEK researchers will take place at the laboratory site of the Consultant in Geel, Belgium and in the case of the dosimetry metrology, at a European national metrology institute. The training will be organised in one training session or where appropriate, in more sessions. The minimum duration of such a long-term training is one year per trainee.
Deliverables (before project end).	By TÜBİTAK UME and TAEK: - Provision of suitable LTT candidates - Attendance, evaluation of short-term training events or mission report. By IRMM: - Hosting and training the 18 LTTs. - Organisation of the 51 short-term training events (see full event list in Annex 6.2).
Hosting institutions	Short-term training events primarily at TÜBİTAK UME and TAEK institutes. Long-term training at IRMM and an EU NMI.
Status at the end of the Fourth Interim period of the Implementation Phase.	
Status	TÜBİTAK UME and TAEK: The second intake of 5 LTTs arrived in Oct/Nov '10 for their long term traineeships in IRMM (one to PTB for a dosimetry traineeship). One more started in IRMM on the 1st May, 2011. Some of the short term training events are hosted in one of the three institutes and some in university or other premises, sourced by TÜBİTAK UME or TAEK. IRMM: 10.5 trainees at 100% of traineeship; 5 trainees at 25-33% of traineeship. 1 LTT at 60% completion. 27 workshops and 10 knowledge dissemination visits (of the total of 36 workshops and 16 knowledge dissemination visits planned) -corresponding to 71% completion rate of IRMM's duty concerning this objective- have been prepared and completed.
Interim deliverables	IRMM: Final reports by 10.5 LTTs. 6 QT1 & 1 QT2 interim reports of another 7 LTTs complete. LTT reports are available via the secure circabc platform which is accessible by the EMIT steering committee members Training event descriptions of all Fourth Interim activities provided in section 3.2

xii. IRMM to organize seminars and workshops for the end users.

ACTIVITY	xii. IRMM to organize seminars and workshops for the end users.
Objective of the activity	Organization of seminars and workshops for the end users
Methodology	F
Implementation period	01.11.2009 – 30.09.2012
Expected result	- 18 seminars/workshops for the end-users and published proceedings - 10 workshops for the universities and published proceedings
Deliverables (before project end).	By TÜBİTAK UME and TAEK: - Provision of contacts with end-users and university professors. By IRMM: - Organisation of the 18 seminars and 10 workshops.
Hosting institutions	TÜBİTAK UME and TAEK institutes; various stakeholder and end-user premises.
Status at the end of the Fourth Interim period of the Implementation Phase.	
Status	TÜBİTAK UME and TAEK: Some of the events are hosted in one of the three institutes and some in university or other premises, sourced by TÜBİTAK UME or TAEK.

	IRMM: 27 of 37 planned events (corresponding to 73% completion rate of IRMM's duty concerning this objective) have been prepared and completed to date. Invitations to some workshops for TUBITAK UME and TAEK staff were also extended to universities making the total we offered much higher than originally foreseen, i.e. 37 events as opposed to 28 in total.
Interim deliverables	IRMM: Training material provided in handout form to the participants. Mission reports completed by the trainers. The participant list and the individual evaluation forms are uploaded onto circabc, after each event. Training event descriptions of all 4th interim activities provided in section 3.2

xiii. IRMM to help familiarize Turkish universities providing education in chemical and (if any) in ionising radiation metrology with the status of alignment of EU university programmes in measurement science with the Bologna requirements.

ACTIVITY	xiii. IRMM to help familiarize Turkish universities providing education in chemical and (if any) in ionising radiation metrology with the status of alignment of EU university programmes in measurement science with the Bologna requirements.
Objective of the activity	Familiarising Turkish universities providing education in chemical and (if any) in ionising radiation metrology with the status of alignment of EU university programmes in measurement science with the Bologna requirements.
Methodology	F, K
Implementation period	01.02.2010 – 30.09.2012
Expected result	Presentations to Turkish universities
Deliverables (before project end).	By IRMM - Communication of Bologna requirements in Turkish universities and corresponding reports.
Hosting institutions	Various.
Status at the end of the Fourth Interim period of the Implementation Phase.	
Status	IRMM: Workshop S04-03, study visit S04-19 and the S04-12 conference completed during the third interim period (corresponding to 100% completion rate of IRMM's duty concerning this objective).
Interim deliverables	IRMM: Presentation material provided in handout form to the participants. Mission reports completed by the lecturers. The participant list and the individual evaluation forms are uploaded onto circa, after each event.

xiv. IRMM to provide consultation to Turkish universities interested in joining Euromaster Joint Degree Programme in measurement science.

ACTIVITY	xiv. IRMM to provide consultation to Turkish universities interested in joining Euromaster Joint Degree Programme in measurement science.
Objective of the activity	Providing consultations to Turkish universities interested in joining Euromaster Joint Degree Programme in measurement science.
Methodology	F, K
Implementation period	01.02.2010 – 30.09.2012
Expected result	- Invitations to at least 20 universities on consultation of their curriculum programmes
Deliverables (before project end).	By IRMM - Completion of training events S04-01, S01-7, S04-18, S04-19, S04-03, S04-02, S04-04_09, S01-08, S01-16, S04-14, S04-13, S02-05, S04-12, S04-21, S01-09, S04-

	02, S01-17, S04-16, S02-02, S04-10, S02-06, S04-15, S04-11 and S02-03.
Hosting institutions	Various universities (with representatives from 20 universities).
Status at the end of the Fourth Interim period of the Implementation Phase.	
Status	IRMM: It was decided from the beginning to use every event carried out in every university (20 so far, 10 more to go) as an opportunity to explain about the project in general (using the opportunity to peak their interest in the Euromaster Joint Degree Programme in Measurement Science). Hence more occasions were used for this than the original 20 foreseen. Events S04-01, S01-7, S04-18, S04-19, S04-03, S04-02, S04-04_09, S01-08, S01-16, S04-14, S04-13, S02-05, S04-12, S04-21, S01-09 and S04-02 complete. (corresponding to 73% completion rate of IRMM's duty concerning this objective). Events S01-17, S04-16, S02-02, S04-10, S02-06, S04-15, S04-11 and S02-03 still to be carried out. Apart from the three places arranged before the end of June (for three Turkish students) to attend the Euromaster Summer school, held in Poznan, Poland (10-23rd July, 2011), there will be a further opportunity for 3-4 students to attend the 2012 Euromaster Summer school to be held in Fatima, Portugal (15 – 28 July). This bottom-up approach may work better than the top-down approach, if the students are enthusiastic about their experience when they return to their home university.
Interim deliverables	IRMM: Presentation material provided in handout form to the participants. Mission reports completed by the lecturers. The participant list and the individual evaluation forms are uploaded onto circa, after each event. Descriptions of all completed events in the 4th interim period are provided in section 3.2

3.1.4 Component 4: Networking and raising awareness (NW & RA)

xv. IRMM to help promote TÜBİTAK UME and TAEK amongst the scientific and metrological community at European level

ACTIVITY	xv. IRMM to help promote TÜBİTAK UME and TAEK amongst the scientific and metrological community at European level
Objective of the activity	Promotion of TÜBİTAK UME and TAEK among scientific and metrological community at European level
Methodology	D
Implementation period	01.10.2009 – 30.09.2012
Expected result	- Information about the development of TÜBİTAK UME and TAEK's capabilities presented to EURAMET at TC meetings and at ICRM.
Deliverables (before project end).	By Turkish scientist: - Using the conference attendance possibilities (S01-15 (a,b,c), S01-18 (#11), S02-04 (a,b), S03-28 (a,b,c), S04-17 (a,b)) and study visits to NMIs or IRMM and workshops held at IRMM or an NMI to promote their home institute (TÜBİTAK UME and TAEK) among scientific and metrological community at European level.
Hosting institutions	Various EU scientific and metrological conferences and meetings.
Status at the end of the Fourth Interim period of the Implementation Phase.	
Status	IRMM: So far events S03-28a, S03-29, S03-08, S03-16, S01 – 21, S01-18, S02-04a, S02-08, S03-25, S03-27, S03-30, S02-04a and S03-19 have been prepared and completed (making up a completion rate of 50% for this objective). Events, which

	contribute to this objective and have yet to be completed, are S03-13, S03-14_15, S03-26, S03-24, S01-22, S03-09, S03-28bc, S03-11, S04-17, S02-04b and S01-15abc.
Deliverables	Mission reports provided by the conference participant and /or by the workshop/study visit organiser. The participant list and the individual evaluation forms are uploaded onto circa, after each event. Description of the relevant event is provided in section 3.2

xvi. IRMM to help establish a network of direct and indirect users of CRMs and metrology services.

ACTIVITY	xvi. IRMM to help establish a network of direct and indirect users of CRMs and metrology services.
Objective of the activity	Establishment and improvement of relationships with direct and indirect users of CRMs and metrology services
Methodology	PAC and SC meetings
Implementation period	01.12.2009 – 30.09.2012
Expected result	- 8 coordination meetings with stakeholders in chemical and ionizing radiations metrology (PAC meetings)
Deliverables (before project end).	By TÜBİTAK UME and TAEK: - Hosting the twice yearly PAC meetings or arranging their hosting elsewhere. By IRMM: - Taking the PAC feedback into account and using it to make improvements throughout the project duration.
Hosting institutions	TÜBİTAK UME, TAEK and other stakeholder's/end-user's institutions.
Status at the end of the Fourth Interim period of the Implementation Phase.	
Status	TÜBİTAK UME and TAEK: PAC-05 (meeting and seminar) hosted at Uludag University, Bursa. The report was sent to the consultant for uploading to circabc. 5 of the 7 PAC meetings have taken place to date. IRMM: Inclusion of PAC-05 feedback in the SC-06 meeting, held at the TAEK-ÇNAEM, İstanbul. Preparation of the SC-06 Meeting Report and inclusion of beneficiary feedback. 6 of the 8 SC meetings have taken place to date.
Interim deliverables	TÜBİTAK UME, TAEK: PAC-05 Meeting/Seminar Report. IRMM: SC-06 Meeting Report. The approved and final minutes of the SC-06 were uploaded onto circabc. SC-06 synopsis provided in section 3.2

xvii. IRMM to help establish a network of universities providing (or interested in providing) a master level university education in chemical and ionising radiation metrology.

ACTIVITY	xvii. IRMM to help establish a network of universities providing (or interested in providing) a master level university education in chemical and ionising radiation metrology.
Objective of the activity	Establishment and improvement of relationships with universities providing (or interested in providing) a master level university education in chemical and ionising radiation metrology
Methodology	B, F, G
Implementation period	01.12.2009 – 30.09.2012
Expected result	- Number of partner universities

Deliverables (before project end).	By IRMM: - Preparation of events S04-01, S04-03, S04-04_09, S04-18, S04-19 (20 university network). All seminar lectures given at universities during the frame of this project indirectly support this objective.
Hosting institutions	Various universities.
Status at the end of the Fourth Interim period of the Implementation Phase.	
Status	IRMM: Events S04-01, S04-18, S04-19, S04-03, S04-02, S04-04_09, S04-12 and S04-02 complete (corresponding to 75% completion rate of IRMM's duty concerning this objective). *Note: S04-04_09 were 6 events in one workshop.* The outstanding planned events which will complete IRMM's duty wrt to this objective are S04-15, S04-10, S04-16 and S04-11. After the success of giving the opportunity to three Turkish students to attend the Euromaster Summer School (during the 4th interim period), in Poznan, Poland (10-23rd July, 2011), plans were set in motion to repeat this for the Euromaster Summer School in Fatima, Portugal this Summer.
Interim deliverables	IRMM: Presentation material provided in handout form to the participants. Mission reports completed by the lecturers. The participant list and the individual evaluation forms are uploaded onto circabc, after each event. Descriptions of all completed events provided in section 3.2

xviii. IRMM to organize national conference sessions and events.

ACTIVITY	xviii. IRMM to organize national conference sessions and events.
Objective of the activity	Organization of national conferences and events
Methodology	H, I, J, L
Implementation period	01.02.2010 – 30.09.2012
Expected result	Location of events will be chosen with a thought about providing equal information opportunities, as much as possible, for stakeholders and interested parties in the country's regions
Deliverables (before project end).	- 3 national conferences in chemical and ionizing radiations metrology organised, coded S02-03, S03-19 and S04-12. By TÜBİTAK UME and TAEK: - Provision of contact people in the organising committees of existing conferences. By IRMM: - Organisation of 0.5 day EMIT sessions at 3 national conferences (with external and Turkish expert speakers).
Hosting institutions	Various.
Status at the end of the Fourth Interim period of the Implementation Phase.	
Status	IRMM and TÜBİTAK UME: The preparation of the "chemical reference measurements" conference session (EMIT S02-03) to be held at the 6th National Congress of Analytical Chemistry, Hatay, Sep. 2012 has slightly progressed during the 4th interim period. Once IRMM are in direct contact with the organising committee, more progress is expected. This is materialising now. IRMM and TAEK: An EMIT conference session (S03-19) was prepared and then held at the National Medical Physics Congress, Izmir from 17-19th Nov., 2011.
Deliverables	IRMM: Description of the completed event is provided in section 3.2.

xix. IRMM will support the participation of TÜBİTAK UME and TAEK experts in international events.

ACTIVITY	xix. IRMM will support the participation of TÜBİTAK UME and TAEK experts in international events.
Objective of the activity	Support of participation of TÜBİTAK UME and TAEK experts in international events
Methodology	D
Implementation period	01.02.2010 – 30.09.2012
Expected result	- At least 10 participations of Turkish experts in international conferences and events
Deliverables (before project end).	By IRMM: - Funding the participation of Turkish scientists at international conferences and events coded S01-15 (a,b,c), S02-04 (a,b), S03-28 (a,b,c) and S04-17 (a,b) (attendance possibility spread equally over the 4 subject areas).
Hosting institutions	Various
Status at the end of the Fourth Interim period of the Implementation Phase.	
Status	Two (of the 10) conference attendance opportunities have been availed of during previous interim periods. During the 4th interim period, 6 more scientists (4 from TUBITAK UME [S01-15abc] and 2 from TAEK-SANAEM S03-28bc)) have elected to attend the BERM 2012 conference in June (during the 5th interim period). Concerning the S04 possibilities (S04-17a,b) one Turkish professor has been selected (during the 4th interim period) to attend the EC2E2N (ACE 2012), April, in Milan, Italy. One more still needs to be identified.
Interim deliverables	A table summarising the selected conferences and scientists is provided in section 3.2 (Table 5).

3.1.5 Result communication

xx. The consultant (IRMM) and the contracting authority (EC Delegation, Ankara) will organise a final wrap-up event in order to present the final results of the project.

ACTIVITY	xix. The consultant (IRMM) and the contracting authority (EC Delegation, Ankara) will organise a final wrap-up event in order to present the final results of the project.
Objective of the activity	To communicate the results of the IPA by organising a final wrap-up event.
Methodology	L
Implementation period	01.02.2010 – 30.09.2012
Expected result	- A conference (with ~participants) representing as many EMIT stakeholders (including end users) as possible.
Deliverables (before project end).	By IRMM and the EUD: - The conference.
Hosting institutions	Various
Status at the end of the Fourth Interim period of the Implementation Phase.	
Status	The planning (by IRMM, the EUD, TÜBİTAK UME and TAEK) started during the 4th interim period. So far a draft list of VIP and other attendees has been drawn up, posters for each workshop are being prepared, an event management supplier is being procured, the

	First Announcement and the First edition of the agenda have been prepared. A special page (with sub-pages) on the EMIT website has also been designed (http://irmm.jrc.ec.europa.eu/activities/Turkey/Pages/ece_emit_concluding_event.aspx)
Interim deliverables	Attendee list, draft posters, "First Announcement" and the "Edition 1" of the agenda.

3.2 OBSERVATIONS ON THE FOURTH REPORTING PERIOD

The fourth phase of implementation comprised of 13 different events, four scientific workshops, one conference session, four study visits (with 6 scientists attending), one conference attendance, one seminar lecture and two project management meetings. One of the problems we encountered in the third interim period, namely to do with slow course registrations, almost disappeared entirely. We think that this is due to the fact that the visibility of the project has increased with increasing maturity of the project i.e. word of mouth about the high quality and aptness of the training courses has spread as well as the fact that our efforts in explaining the project as a whole at the beginning of every course, spreading the web site address and spreading flyers about the upcoming events have all paid off.

Key points from PAC meeting during the Fourth Interim Period (methodology M):

PAC5 meeting (20.10.2011)
The PAC 5 meeting was held in Uludag university, Bursa, and was preceded by a three day workshop entitled "Integrated Quality Systems - an interpretation for universities", which was attended by 34 Turkish scientists (spanning many types of end users).

Mr. Cankur opened the PAC meeting with a reminder of the importance of the PAC members for the EMIT Project implementation. The total number of participants was 15, 10 from TÜBİTAK UME, TAEK ÇNAEM and SANAEM and 5 PAC Members and other end users. The PAC audience were asked to contribute suggestions as to an even better functioning of the project. See section 5.2.1 for recommendations from the PAC on this occasion.

Key points from SC meeting during the Fourth Interim Period (methodology N):

EMIT SC6 (27.10.2011)
The SC6 meeting was hosted by Mr. Erdal Osmanlioglu and Ms. Nurdan Güngör, TAEK-ÇNAEM, İstanbul.
The minutes of the Steering Committee meetings are restricted to the SC members but in summary, the agenda topics were a) Feedback from the Project Director by Mr. P. Taylor; b) Feedback from the EUD by Ms. E. Yazici; c) Feedback from the 5th Project Advisory Meeting by the Senior Project Office (TÜBİTAK UME) – Mr. O. Cankur; d) Feedback from the EMIT Project Team Leader (Ms. J. McCourt) in terms of reporting the current LTTs topics and summarising the project training activities which took place between the last SC (April 2011) and now. The planning of Long Term Training (LTT) and Short Term Training (STTs) activities for the fifth interim period (Jan – June 2012) was also reported upon as well as e) AOB which concerned EMIT II and the impact of SNE contracts as well as the issue of CFCU monitoring reports. See section 5.2.2 for recommendations from the SC on this occasion.

Key points from the 3rd intake of Long Term Trainees –QT reports (methodology A):

- NP Unit – EMIT Trainee – A. Dirican; Supervisor Dr. S. Pommé
  - "Standardisation of activity and decay data measurements".

A one year long term traineeship commenced on the 1st June, 2011. The specific objectives are to:

- Assist with high resolution alpha-particle spectrometry
- Assist with alpha-particle counting at defined solid angle
- Assist with half-life measurements
- Get acquainted with essential principles of primary standardisation
- Assist with development of new techniques (NaI well detector)
- Assist with development of new projects

The training topics set for the second quarter (01.08.2011 to 31.10.2011) were:

i. Source manipulation and data acquisition
ii. High-resolution alpha-particle energy spectrum deconvolution
iii. Coincidence summing correction
iv. Design of the electron bending magnet for alpha spectrometry
v. Preparation of qualitative U-238 sources by drop deposition
vi. Method validation studies of gross alpha measurement with alpha spectrometer.
vii. Identification of leakage current and high voltage of various pips detectors.

At this stage in the traineeship, the trainee has become familiar with many aspects of defined solid angle spectrometry and alpha spectrometry systems.
High-resolution alpha-particle spectrometric measurements on the ^{230}U decay series were performed. The spectra were combined and analysed using an in-house energy compensation algorithm. Spectral de-convolution software was used. The six alpha-emitters in the decay series were identified, their alpha emission energies were verified and emission probabilities were determined for ^{230}U and ^{226}Th. Mr. Dirican assisted in primary standardisation measurements of U-238, in order to determine the half-life of this long-lived radionuclide. DSA and APS measurement results of U-238 were shifted and extrapolated respectively.

A poster entitled “The use of solid angle for alpha detector efficiency in Ra-226 analyses of soil samples” was prepared for the 18th International conference on Radionuclide Metrology and its application. The associated publications are listed in section 3.3.2.

In order to validate the gross alpha measurements of a newly purchased gross alpha/beta system, U-234, U-238, Po-210 and Ra-226 samples were prepared for 8 different mineral water samples. For this study we used the dilution alpha spectrometric technique. Energy calibration of 6 detectors was carried out for an environmental alpha spectrometer. Mr. Dirican was also involved in new Ac-225 and Ac-227 projects. Related published literature have been collected and examined.

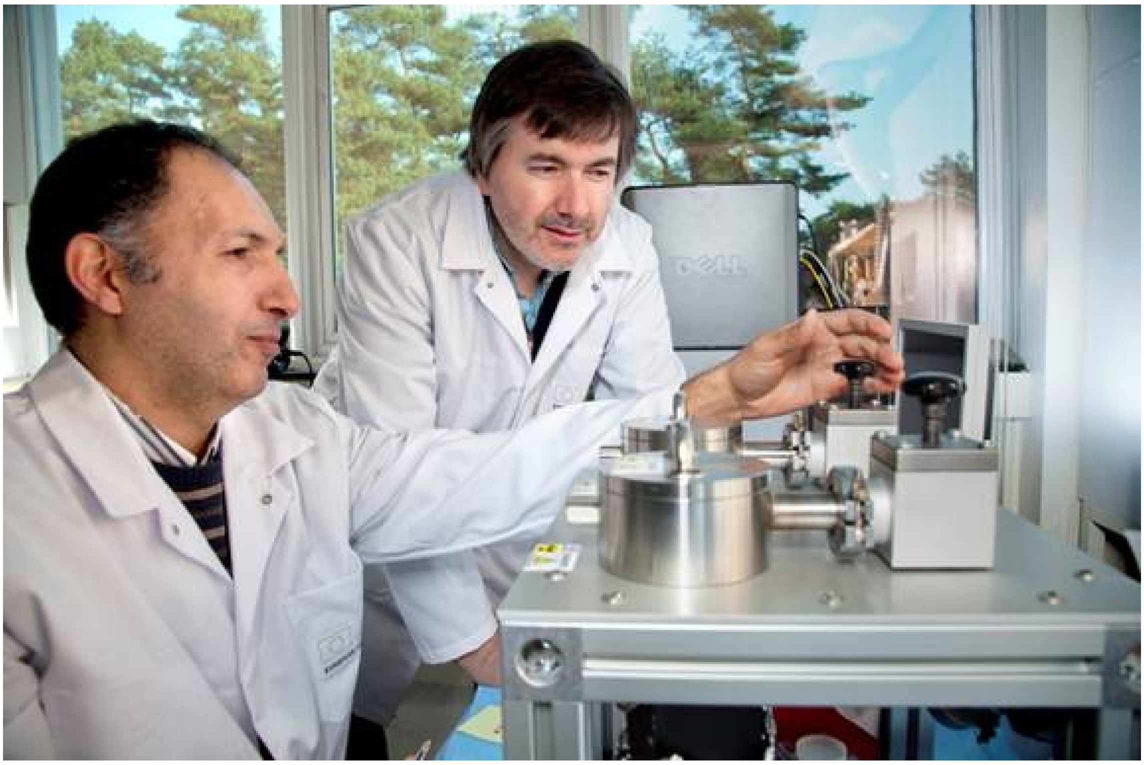


Figure 4: Mr. A. Dirican (LTT) being trained by Mr. S. Pommé on Standardisation of activity and decay data measurements.

- PTB – EMIT Trainee – E. Kapdan; Supervisor Dr. H. Janssen (PTB); Dr. U. Rosengard (IRMM)
  - "Metrology for dosimetry".

  A one year long term traineeship commenced on the 1st Sep., 2011. The specific objectives are to:
  - Therapy level dosimetry applications including uncertainty calculations
  - Brachytherapy level dosimetry applications including uncertainty calculations
  - Diagnostic X-Ray Systems including uncertainty calculations
  - Protection Level dosimetry applications and uncertainty calculations.
  - Monte Carlo Dose Calculations
  - Neutron Dosimeter (with Am-Be sources)

At this stage in the traineeship, the trainee has become familiar with:

i. Well-type chamber and source calibrations and calculation procedures
ii. Quality assurance of dosimeters
iii. Uncertainty budget calculations
iv. Calibration of neutron personal dosimeters
v. Monte Carlo Dose Calculations
vi. Beta dosimetry

Mr. Kapdan started being trained in the Ionizing Radiation division at PTB on the 1st of September 2011. The trainee started out in the neutron dosimetry department where he was trained in special calibrations of neutron personal dosimeters. He was also involved in calibration processes and informed about different kinds of calibration techniques on neutron dosimeters. During this term there was a comparison test of TLD dosimeters sent by different private companies in Germany. The irradiations of dosimeters were performed at the PTB.
Then, Mr. Kapdan began being trained at the department of dosimetry for radiation therapy and diagnostic radiology from mid September to the end of the October. The most important part of this training was composed of calibration of well-type ion chambers and also radioactive sources used for cancer treatments

in the aspect of brachytherapy. At the beginning, there was an intercomparison experiment applied on PSDL's of different countries in Europe about the systems of calibration of HDR (high dose rate)-brachytherapy sources in terms of Reference Air Kerma Rate (RAKR). The trainee was an observer during this process. After finishing these tests, Mr. Kapdan was involved in calibration processes at the same laboratory for the well-type ion chambers and also sources. Then, he dealt with and was well informed of Calibration of LDR (Low dose rate)-brachytherapy sources. He has also received on-the-job training on the operation of the primary standard water calorimeter. The trainee was then taught how to set up uncertainty budgets and calculations using Monte Carlo Simulation software (EGSnrsMP GUI). These calculations related with these MCC will continue in other departments during the course of the traineeship.
For the month of November, the trainee began training at the radiation protection dosimetry department. Firstly, Mr. Kapdan was involved in calibrations of beta emitting sources in the primary standard beta dosimetry laboratory, then, also irradiations of beta dosimeters in the secondary standard beta dosimetry laboratory. There was a maintenance or check-up process during his training in secondary standard beta dosimetry laboratory. He was given very useful presentations about these processes and was present in a leakage test of a portable X-ray machine by using imaging plates. After that, he was shown open area-environmental radioactivity measurement works located at the west sides of PTB. Towards the end of Nov., there was a very important conference on advanced metrology for cancer therapy (CAMCT 2011) between the November 29th and December 1st, 2011 at the PTB, which the EMIT trainee got to attend.

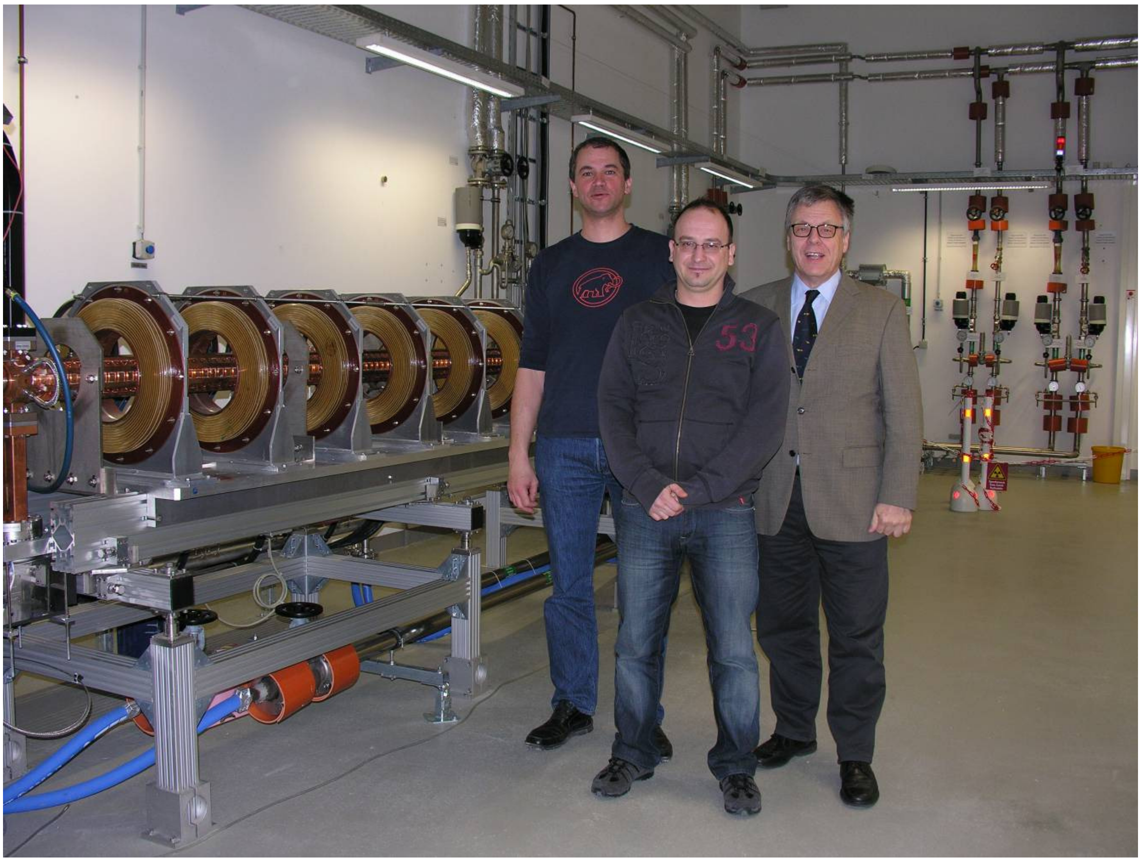


Figure 5: Mr. E. Kapdan (current LTT at PTB) being trained on "Metrology for dosimetry".

- RM Unit – EMIT Trainee – Mr. Alper İşleyen; Supervisor Dr. J. Snell
    - "Aspects of Reference Material production - Trace elements in milk (Ref Mat)".

A one year long term traineeship commenced on the 5th September, 2011. The specific objectives are to:

- Assess the homogeneity of certain trace elements in the milk powders

- Assess the short and long term stability of certain trace elements in the milk powders
- Organise and contribute to the characterisation study of the candidate CRM
- Contribute to the writing of the certification report

The main purpose of the training is to learn the aspects of reference material production by means of training on-the-job regarding the ongoing "Elements in two Skimmed Milk Powders" project. Specific tasks for the first quarter include the organisation of homogeneity and characterisation studies of the material which needs to be organised in cooperation with external partners. At this stage the trainee has been involved in the following on-the-job training:

i. Preparation of a list of candidate collaborator laboratories for the characterization study according to RM PR/0014 from IRMM's validated supplier database.
ii. New laboratories that might collaborate to the characterisation study were searched through EA European co-operation for accreditation (http://db.european-accreditation.org) and added to the IRMM's supplier database for validation according to RM PR/0014 on the basis of their accreditation scopes.
iii. Annex documents for the Invitation to Tender (ITT) were prepared according to RM PR/0004 and RM PR/0008 on specifications for the measurements required for the between unit homogeneity assessment and characterisation studies.
iv. A dedicated study to establish the minimum sample intake for the elements Cd, Cu, Zn and Pd in milk powders ERM BD-150 and ERM BD-151 was done according to RM PR/0017 using solid sampling AAS (RM WI/0390).
v. NIST's non-fat milk powder SRM 1549 and IAEA's whey powder IAEA-155 were selected and purchased to be tested to use as the quality control (QC) material for the characterization study. Selection of these materials was based on their matrices characteristics, number of certified elements and quantity of these elements.
vi. Preliminary test digestion of the candidate CRM milk powders ERM BD-150 and ERM BD-151 along with the NIST's non-fat milk powder SRM 1549 and IAEA's whey powder IAEA-155 was done using microwave UltraCLAVE digestion system according to RM WI/0246. Based on the determination of elements in food matrices (RM WI/0247) we started measurement of 7 elements on ICP MS (RM WI/0274).
vii. For dry mass correction, water content analysis on NIST's SRM1549, IAEA155 was done.
viii. Examination (bulk, micrograph and water content) of the milk powder ERM BD150 which was exposed to 60 °C for 4 weeks was performed.
ix. Participated to the EMIT workshop S01-10: "Planning, Processing and Certification of Reference Materials".

Figure 6: Mr. A. İsleyen (current LTT) being trained by Mr. J. Snell on aspects of RM production (trace elements in milk powders) .

- RM Unit – EMIT Trainee – Mr. Murat Tunc; Supervisor Dr. C. Quetel.
    - "Inorganic Chemical/Isotopic methodology for Reference Measurements".

  A one year long term traineeship commenced on the 5th September, 2011. The specific objectives are to:

  - To receive training in working according to the IRMM and RM unit Quality Systems
  - To receive training on ICPMS instrumentation, and help maintaining, on a daily basis, the ICPMS instrumentation
  - To acquire practical experience in carrying out work in the ICPMS laboratories and sample preparation (incl. sample digestion, matrix separation etc.) laboratories, in particular the ultra-clean chemical laboratory; this will be done in conformity with the regulations of occupational health and safety, radiation protection, environmental protection and security
  - To receive training on designing, optimising and implementing methods for reference isotopic ratio and isotope dilution measurements by ICPMS
  - To develop some ability for checking and evaluating results, estimating uncertainty for isotopic measurement results and applying it as a tool for method validation
  - To receive training in writing measurement reports and presenting results

  At this stage in the traineeship, the following trainings were initiated (most of which are obligatory to be able to work in the labs and perform the activities specified in the hands-on training):

  i. General introduction of IRMM for the newcomers, including the tour around the IRMM site, computer related issues etc.;
  ii. Training on operation in ICPMS main laboratories and ICPMS Sample Preparation Laboratory including explanations on health and safety rules according to WI-0134, WI-0136, WI-0139 and WI-0140
  iii. Usage of Milestone Microwave digestion system according to WI-0092.
  iv. Labware cleaning according to WI-0089.
  v. Introduction to working in UCCL (Ultra Clean Chemistry Laboratory) according to WI-0057.

vi. Training on operation of Milli-Q system and the ultra-sonic bath in the SPL according to WI-0133 and WI-0135.
vii. Introduction to the work in the medium clean laboratory (MCL).
viii. Introduction to the Quality Management System of IRMM and of the RM Unit.

Upon arrival at IRMM the trainee joined the last leg of the project which was aiming at establishing reference measurement values for the test material (soya based baby milk powder) of the IMEP 113 comparison coordinated by IRMM as the European Union Reference Laboratory for Heavy Metals (EURL HM). As specified in the previous group 2 EMIT LTT's quarterly report, preliminary investigations and certification measurements included method development, validation and data treatment studies. M. Tunc became directly involved and could directly contribute to aspects of the sample preparation phase (microwave digestion for cleaning purposes, matrix separation), ICPMS acquisitions, data processing and evaluations of the results (incl. the discussion on uncertainty estimation). He also participated in a joint project regarding the ampoulation process of gravimetrically prepared daughter solutions of the NIST SRM 991 material.
The trainee then joined the EMRP ENV02-WP4 project "Providing underpinning traceability for mercury vapour measurement", which has just been initiated.

The trainee also followed some additional training:
1. EMIT workshop S01-10: "Planning, Processing and Certification of Reference Materials"
2. Training course: "Use of RMs and the estimation of measurement uncertainty"

Figure 7: Mr. M. Tunc being trained by Mr. C. Quetel on Inorganic Chemical/Isotopic methodology for Reference Measurements.

- NP Unit – EMIT Trainee – Ms. Gülten KAHRAMAN (TAEK-SANAEM); Supervisor – T. Altzitzoglou.
  - "Liquid scintillation counting for standardisation of radionuclides".

A one year long term traineeship commenced on the 3rd October, 2011.

The specific objectives are to become familiar with:
- Theory of Liquid Scintillation Counting
- Sample preparation (incl. gravimetric source preparation for standardization)

- Use of the Wallac 1220 Quantulus LSC
- Efficiency calibration - Quench curves
- The CIEMAT/NIST efficiency tracing method
- Dual- and Multi-label counting
- Uncertainty budget
- Good Laboratory Practices (GLP) and Instrument Performance Assessment (IPA)

At this stage in the traineeship, the trainee has become familiar with:

i. Theory of Liquid Scintillation Counting

ii. Use of the Wallac 1220 Quantulus LSC (incl. preparation the protocol, measurement and evaluation of the registry file).

iii. Gravimetric preparation of H-3 standard sources in different LS cocktails for establishing of the quench curves.

iv. Preparation of quench curves of H-3 solution for different cocktails.

v. Calculation of uncertainty for H-3 measurements.

vi. The CIEMAT/NIST method (explanation of the method and the use of the calculation programme)

vii. Calculation of activity and uncertainty of Sr-90 solution by the CIEMAT/NIST efficiency tracing method.

viii. Calculation of activity and uncertainty of Ni-63 solution by the CIEMAT/NIST efficiency tracing method.

ix. Full uncertainty budget calculation for Ni-63.

The LSC measurement technique is applicable to all forms of nuclear decay emissions (alpha and beta particle, electron capture, and gamma ray emitting radionuclides). The CIEMAT/NIST efficiency tracing technique, being one of the LSC methods, determines the activity of a source in combination of theoretical calculations of counting efficiency with the experimental data obtained from a commercial counter, using a suitable efficiency tracer (e.g. 3H).

During this period of Ms. Kahraman was trained how to calculate the activity of Sr-90 and Ni-63 solutions with the CIEMAT/NIST efficiency tracing technique using H-3 as tracer. Firstly, the information about LSC theory and equipment, source preparation by using a microbalance, tritium quench curve establishment, data evaluation, theory of CIEMAT/NIST method and using the calculation programme were given. Then, measurements and calculations for Sr-90 and Ni-63 solutions were done by using the Wallac 1220 Quantulus LSC and the CIEMAT/NIST programme. Finally, the trainee was shown how to prepare an uncertainty budget table for a Ni-63 solution.

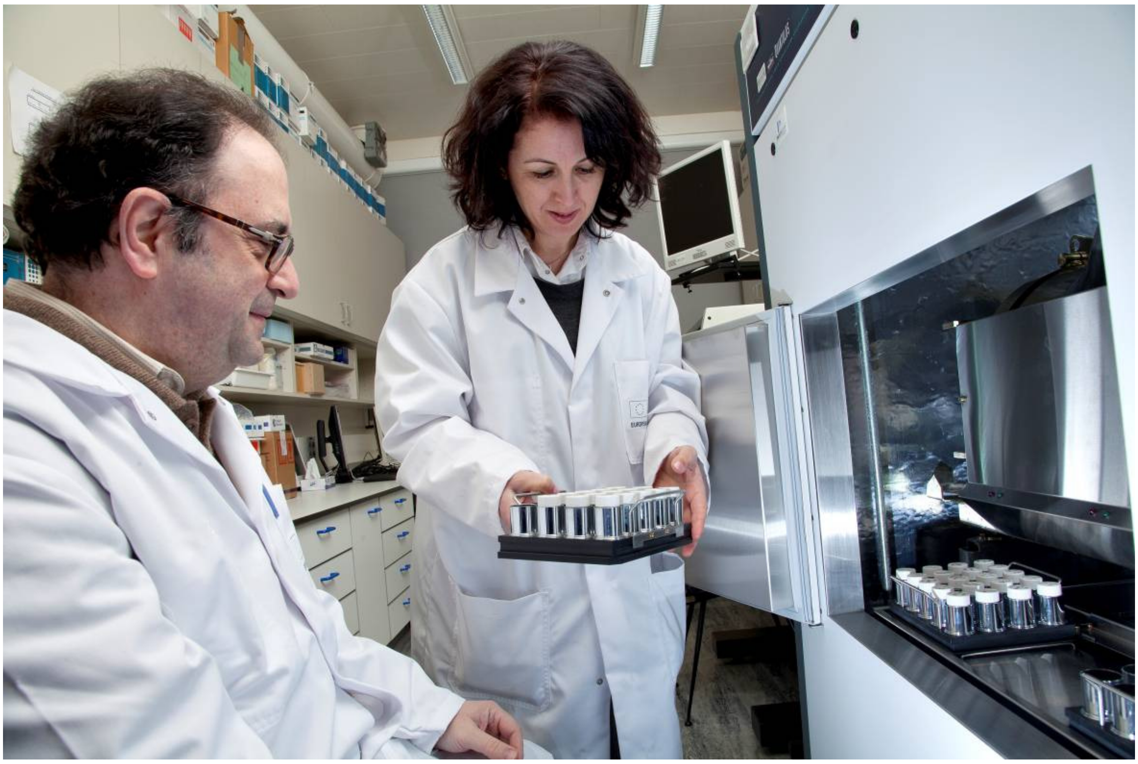


Figure 8: Ms. G. Kahraman (current LTT) being trained by Mr. T. Altzitzoglou on Liquid Scintillation Counting.

- NP Unit – EMIT Trainee – Mr. Hasan DIKMEN (TAEK-SANAEM); Supervisor Dr. S. Pommé.
    - "Primary and secondary standardisation of radionuclide activity ".

A one year long term traineeship commenced on the 3rd October, 2011. The specific objectives are to:

- Become acquainted with different primary standardisation techniques. Become acquainted with ionisation chamber measurements.
- Learn to perform accurate activity concentration measurements and decay data (half-lives, emission probabilities).
- Learn to make uncertainty budgets.
- Assist with the design and carrying out of laboratory experiments.
- Assist with development of data acquisition/analysis software.
- Perform data analysis and contribute to the writing of reports/publications.
- Assist with gamma-ray spectrometry where useful in projects (impurity measurements, decay data measurements).
- Assist with the modelling of measurements where useful.

At this stage in the traineeship, the trainee has become familiar with:

i. Introductory information on primary standardization systems
ii. Half life measurement of Ac-225

The principle of primary standardization was introduced to Mr. Dikmen. The purpose and use of all necessary apparatus and equipment for this primary standardization technique were explained. Related publications in literature have been read and studied by the trainee. This will prove useful in the next stages of the training concerning direct standardization methods.
Mr. Dikmen participated in the half life measurements of Ac-225. In particular using a HPGe detector to measure by gamma-ray spectrometry the activity of a source as a function of time. Related publications

have been collected and examined. A set of measurements was performed and analysed to obtain a preliminary value of the Ac-225 half-life.

Figure 9: Mr. H. Dikmen (current LTT) being trained by Mr. S. Pommé on Primary and secondary standardisation of radionuclide activity.

Key points from (4th interim) Short Term Training actions, workshops, seminars (methodologies B, E, F, G):

The appreciation of Turkish scientists for the workshops provided (primarily by IRMM staff and some external experts) is summarised in Table 1 (page 10).

- **EMIT S01-04 Workshop** on Use of certified reference materials.
    - Trainers: Dr. A. Bernreuther, Dr. G. Auclair and Dr. L. Majoros
    - 5-6th September, 2011, TÜBİTAK UME, Gebze.
    - Participants: There were 29 external participants.

In the frame of the Europe and Metrology in Turkey project, a 2 day workshop entitled "Use of certified reference materials" was held with 29 external participants (spanning all stakeholders) in the TÜBİTAK UME, Gebze, Turkey.
The point of this workshop was two fold 1) to give the chance to the audience to become familiar with certified reference materials and 2) to provide the attendees with the knowledge on how to estimate measurement uncertainties.
The lectures provided were:

- Estimation of measurement uncertainties I
- Estimation of measurement uncertainties II (exercise & discussion)
- Use of CRMs to prove laboratory and method performance I
- Use of CRMs to prove laboratory and method performance II (exercise & discussion)
- Proper handling, use and storage of reference materials and making best use of available information I
- Proper handling, use and storage of reference materials and making best use of available information II (exercise & discussion)

- Use of CRMs in uncertainty estimation of chemical measurements I
- Use of CRMs in uncertainty estimation of chemical measurements II (exercise & discussion)
- Commutability I
- Commutability II (exercise & discussion)
- Selection of reference materials I
- Selection of reference materials II (exercise & discussion)
- Traceability of measurements – an important contribution of Certified Reference Materials to modern quality assurance

The workshop agenda is available via the course contents tab http://irmm.jrc.ec.europa.eu/Turkey.

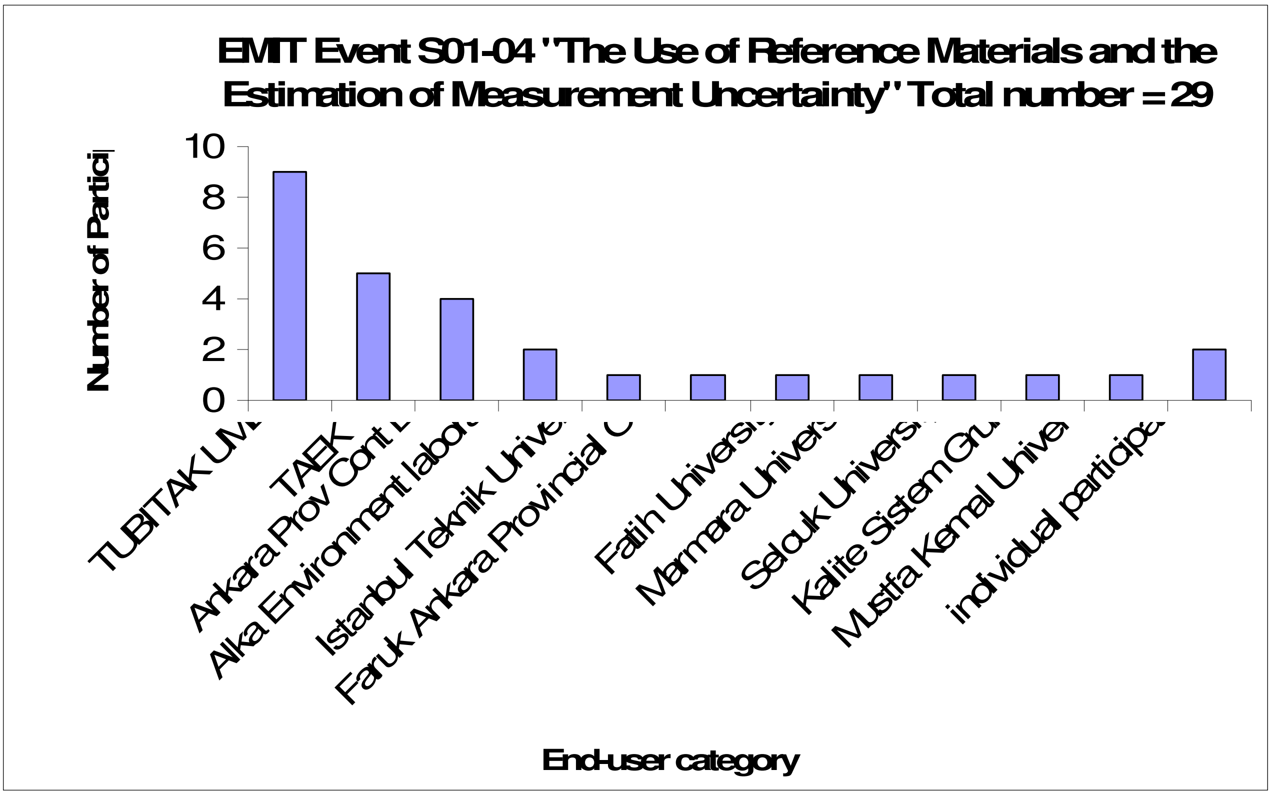


Figure 10: The origin of the participants at the S01-04 workshop.

When the participants were asked to evaluate how well the objectives (were met) and the theme of the workshop, 26 returned the evaluation sheets, with 31% saying "excellent", 65% saying "good", 4% saying "satisfactory and 0% saying "unsatisfactory".

Figure 11: Participants at the EMIT S01-04 workshop at TÜBİTAK UME, Gebze.

- **EMIT S01-10 Workshop** on "Planning, preparation and certification of reference materials"
    - Trainers: Dr. H. Emteborg, Dr. R. Koeber and Dr. L. Majoros
    - 20-22nd September, 2011, IRMM-JRC-EC, Geel, Belgium.
    - Participants: There were 18 TÜBİTAK UME external participants.

In the frame of the Europe and Metrology in Turkey project, a 3 day workshop entitled " Planning, preparation and certification of reference materials" was held with 18 external participants (restricted to TÜBİTAK UME) in EC-JRC-IRMM, Geel, Belgium.
In advance of this workshop TÜBİTAK UME scientists had to:

- Prepare a detailed project plan per project.
- Decide who should come as the number of participants was limited to maximum 20 in order to foster round table discussions. This was considered really important as IRMM did not wish to have inactive participants around the table.
- Identify 3 projects which turned out to be i) Aflatoxin in dried fig, ii) SO2 in dried apricot and iii) Trace elements in hazelnut.
- For the sake of maximising the learning outcome via the workshop, "role playing" was considered essential. Therefore UME were asked to identify and nominate 3 project responsibles, 3 experts on processing and 3 experts on quality management from the group of attendees as well as deputies for all functions. They were also asked to identify an expert on shipment, storage and dispatch combined with risk prevention measures to be taken during the project. It was considered best that the roles should rotate between the projects i.e. a different QM per project, for example. In this way discussion amongst the group could also be more easily facilitated throughout the planning phase and during the kick-off meeting.

During the three day event, the topics were divided as follows:

- Day 1 – Planning (covering all three case studies separately)

- Day 2 – Processing (covering all three case studies separately)
- Day 3 – Certification (covering all three case studies separately)

A kick-off meeting for each "project" was setup with TÜBİTAK UME scientists taking the roles as project responsible, Quality manager, processing responsible etc. as they had already prepared prior to the workshop. The teams then had to discuss storage, dispatch, distribution, transport, risk assessment and protection measures and safety of the future CRM with on the spot interjections from the IRMM staff when/if necessary.
Directive 95/2/EC and Commission Regulation EC No. 1881/2006 (Commission Regulation No 165/2010) were distributed to UME in order to help their preparation. This Directive stipulates the contaminants and maximum allowed concentrations in foodstuffs good for consumption in the EU.
A concluding session was also held where feedback was provided verbally and in the form of a concluding document with a list of the do's and don't per future CRM.

The workshop agenda is available via the course contents tab http://irmm.jrc.ec.europa.eu/Turkey.

When the participants were asked to evaluate how well the objectives (were met) and the theme of the workshop, 13 returned the evaluation sheets, with 15.4% saying "excellent", 69.2% saying "good", 15.4% saying "satisfactory and 0% saying "unsatisfactory".

Figure 12: Participants at the EMIT S01-10 workshop at EC-JRC-IRMM, Geel, Belgium.

- **EMIT S01-05 Workshop** on "Preparation of certified reference materials".
  - Trainers: Dr. H. Emteborg, Mr. Charoud-Got and Dr. L. Majoros
  - 4-5th October, 2011, TÜBİTAK UME, Gebze.
  - Participants: There were 19 external participants.

In the frame of the Europe and Metrology in Turkey project, a 2 day workshop entitled "Preparation of certified reference materials" was held with 19 external participants in TÜBİTAK UME, Gebze.

The following steps were discussed in detail during the 2 day training course:
On the first day, presentations covered important information on principles and practical aspects of the processing of reference materials such as:

- Feasibility studies
- Initial characterisation of the starting material
- Refinement of the material (drying, crushing, milling etc.)
- Mixing of various components
- Subdivision into individual sample units (filling / bottling / ampouling)
- Containment and labelling
- Process control (water content and particle size analysis)

On the second day, interactive discussions were organised in order to disseminate the theoretical concepts. Case studies in different fields such as trace elements in soil, aflatoxins in plant materials and processing of nuts were discussed and concepts were put into practice. This session was supported by trainers who helped in asking crucial questions and guided the group to fruitful discussion and conclusion.

There is an increasing demand in the subject of installation and build-up of the processing laboratory at TÜBİTAK UME, thus a special section was devoted to the procurement of equipment used in the field of processing of certified reference materials. Participants were encouraged to raise their own project proposals and ideas during the training in the field of processing of reference materials, which made the entire training very useful

The workshop agenda is available via the course contents tab http://irmm.jrc.ec.europa.eu/Turkey.

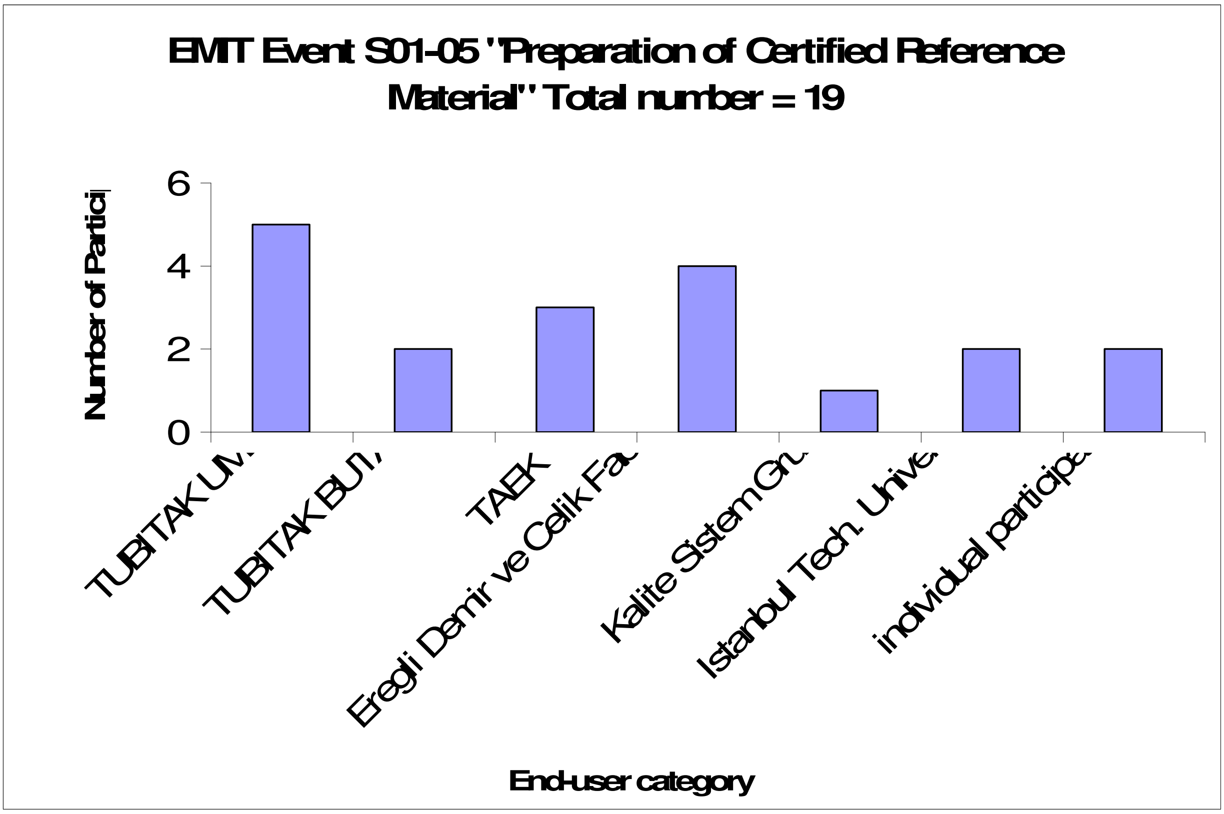


Figure 13: The origin of the participants at the S01-05 workshop

When the participants were asked to evaluate how well the objectives (were met) and the theme of the workshop, 18 returned the evaluation sheets, with 50% saying "excellent", 44% saying "good", 0% saying "satisfactory and 6% saying "unsatisfactory".

Figure 14: Participants at the EMIT S01-05 workshop at TÜBİTAK UME, Gebze.

- **EMIT S01-09 Seminar** lectures on "Use and certification of reference materials".
    - Lecturers: Dr. L. Majoros (JRC-IRMM), Dr. E. Engin (TUBİTAK UME).
    - 6th October, 2011, Ondokuz Mayis University, Samsun.
    - Participants: 109.

The seminar covered the following topics: planning a certification project, designing homogeneity and stability assessments as well as explanation of characterisation studies according to the ISO Guide 34. Afterwards practical information was delivered to the audience about how to use reference materials, where to find practical details and how to search them in the most effective way. Among others, the Comar database was explained. Several leaflets such as the full catalogue of IRMM's Certified Reference Materials, application notes and leaflets about IRMM activities in the fields of clinical, engineering, environment and food were sent to the contact person, upon return to IRMM. Furthermore the upcoming events of the EMIT project were announced.

By disseminating this knowledge, the audience became familiar with CRMs and future collaborations between universities, EC-JRC-IRMM and TÜBİTAK UME were thus facilitated. These seminars have the advantage of attracting attention to the subject of metrology which is highly desirable in Turkish (and European) universities.

Attendees of seminar lectures are not requested to fill out an evaluation form as they are not considered as training courses, more as knowledge dissemination events.

Figure 15: Participants at the EMIT S01-09 workshop at Ondokuz Mayis University, Samsun.

- **EMIT S04-02 Workshop** on “Integrated quality systems – an interpretation for universities”
    - Trainers: Dr. M. Bickel, Dr. J. McCourt , Dr. V. Gegevicius (JRC-IRMM), Dr. Werner Bellmann, Key Expert, IPA SQIT; Dr. Halil Ibrahim CETIN, Accreditation Department, TURKAK and Dr. Nilgun Tokman, TÜBİTAK UME.
    - 18-20th October, 2011, Ulugdag University, Bursa, Turkey.
    - Participants: 34 external participants.

In the frame of the Europe and Metrology in Turkey project, a 3 day workshop entitled "Integrated quality systems – an interpretation for universities" was held with 34 external participants (spanning all stakeholders) in the Ulugdag University, Bursa, Turkey.
The points of this workshop were:

- To provide theoretical and practical guidance on the requirements for integrated management systems and their possible interpretation in the universities.
- To provide guidance on standards applied in integrated management systems.
- To provide information on available quality control methods including proficiency testing schemes and interlaboratory comparisons.
- To share experience on how (integrated) management systems can be assessed and improved.

The lectures and practical exercises provided were:

- Basics of Quality Management by Dr. M. Bickel, EC-JRC-IRMM
- Managerial requirements for quality management by Dr. M. Bickel, EC-JRC-IRMM.
- Practical exercise – to write a quality policy. Moderator - Dr. V. Gegevičius, JRC IRMM.
- Standards. ISO 9001, ISO 17025, ISO 14001, OHSAS 18001 by Dr. J. McCourt, EC-JRC-IRMM
- Control of documents and records by Dr. V. Gegevičius, JRC IRMM.
- Strengthening the Quality Infrastructure in Turkey (SQIT) – Objectives and status by Dr. Werner Bellmann, Key Expert, IPA SQIT, Ankara.
- Proficiency testing and interlaboratory comparisons concepts by Dr. Werner Bellmann, Key Expert, IPA SQIT, Ankara.
- Proficiency testing and interlaboratory comparisons – benefits and pitfalls by Dr. Halil Ibrahim CETIN, Accreditation Department, TURKAK.
- Staff qualification and laboratory requirements by Dr. M. Bickel, EC-JRC-IRMM

- Customers, stakeholders management including practical exercise by Dr. V. Gegevičius, EC-JRC-IRMM
- Reporting results by Dr. M. Bickel, EC-JRC-IRMM
- Learning from mistakes, improvement by Dr. M. Bickel, EC-JRC-IRMM.
- Assessment of management systems by Dr. M. Bickel, EC-JRC-IRMM.
- Ways to demonstrate traceability using TÜBİTAK UME's services by Dr. Nilgun Tokman, TÜBİTAK UME, Gebze.
- Practical group work on a definition of the curriculum of the university. Moderator - Dr. V. Gegevičius, JRC IRMM.

The workshop agenda is available via the course contents tab http://irmm.jrc.ec.europa.eu/Turkey.

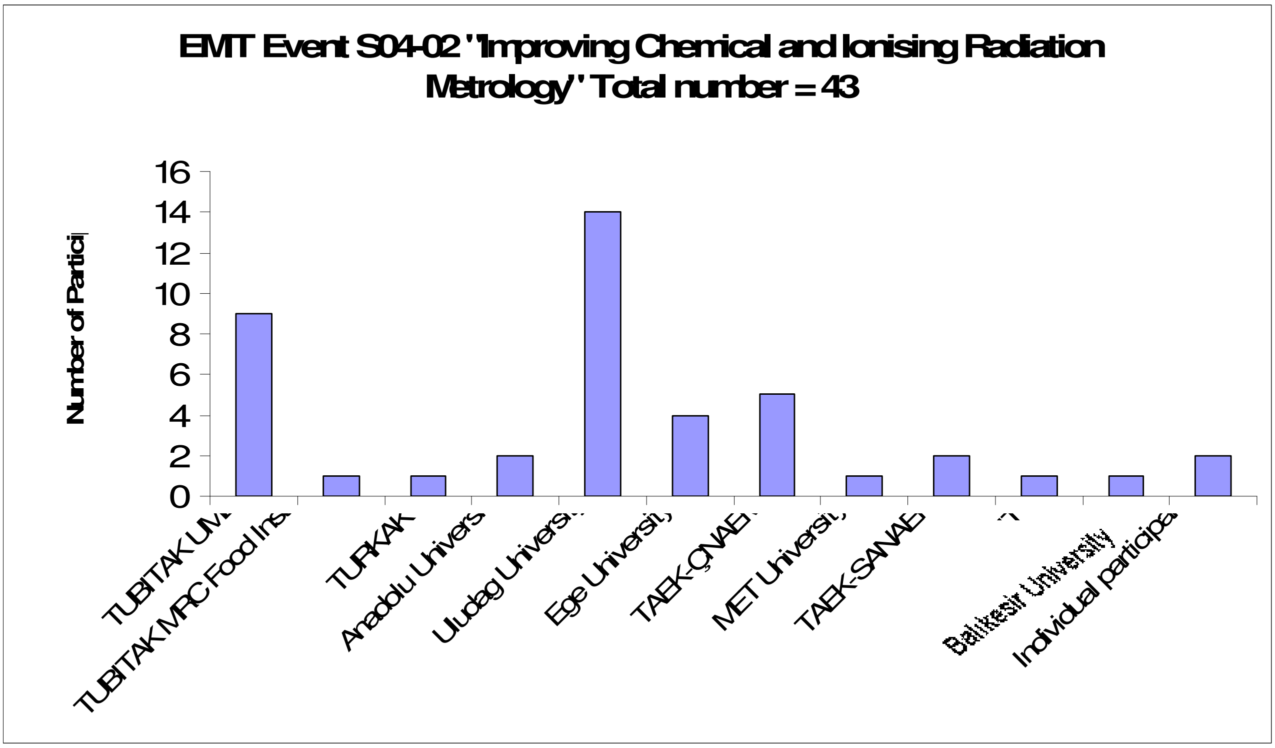


Figure 16: The origin of the participants at the S04-02 workshop.

When the participants were asked to evaluate how well the objectives (were met) and the theme of the workshop, 28 returned the evaluation sheets, with 36% saying "excellent", 61% saying "good", 4% saying "satisfactory and 0% saying "unsatisfactory".

Figure 17: Participants at the EMIT S04-02 workshop at the Ulugdag University, Bursa, Turkey.

Key points from (4th interim) Short Term Training actions – Study Visits (methodology C):

- **EMIT S03-30 Study visit** to PTB
  - Hosts: Prof. Dr. Janssen, Dr. Peter Ambrossi, Dr. Ole Jansnale, Dr. Achim Krauss and Dr. Peter Kapsch
  - 7-8th July, 2011, PTB, Germany.
  - Participants: Dr. Nurdan Gungor (TAEK-ÇNAEM)

During Dr. Gungor's two day visit to PTB the following was accomplished:

At the beginning, Prof. Dr. Janssen showed Dr. Gungor the "Environmental Radioactivity Laboratory" explaining which radioactivity measurements can be done in the range of a few millibecquerel up to some kilobecquerel. Thereafter Dr. Peter Ambrossi highlighted type tests according to radiation protection ordinance and x ray ordinance. This was followed by a visit to the "Activity Unit" where Dr. Ole Jansnale along with Prof. Janssen presented how to determine of the activity of solid radioactive sources, the activity per unit mass of radioactive solution and how to prepare the activity standard.
On the second day, in the "Unit of Absorbed Dose to Water", Dr. Achim Krauss informed Dr. Gungor about establishing a water calorimeter as a Primary Standard in the ^{60}Co reference field. Finally in the "High Energy Photon and Electron Radiation Laboratories", Dr. Peter Kapsch gave general information about practical clinical dosimetry using an accelerator.
The study visit was also used to finalise some details of the workshop training events S03-20, S03-21, S03-22, S03-24 and S03-26. Ms. Gungor was very pleased with the study visit.

- **EMIT S04-21 Study visit** to the Euromaster in Measurement Science – Summer school, Poznań (Poland).
  - Hosts: Coordinated by the University of Warsaw and hosted by the Adam Mickiewicz University, Faculty of Chemistry, Grunwaldzka 6; 0-780 Poznań, Poland.
  - 10-23rd July, 2011, Poznań, Poland.

- Participants: Ms Fulya Aydin, Mr Serkan Demir and Mr Hasan Yakan of Ondokuz Mayis University, 55139 Kurupelit-Samsun.

During this two week period, 43 students from thirteen countries participated in the 4th Measurement Science in Chemistry International Summer School in Poznań, Poland. Students came from Bulgaria, Estonia, Finland, France, Latvia, Poland, Portugal, Serbia, Slovenia, Spain, Turkey, Uganda and Ukraine. This event was not organised by the EMIT project but it was used as an opportunity for Turkish students to attend the Euromaster Summer school in a "bottom up" approach to show the benefits of such harmonised training in Measurement Science at Master level.

Students learned about quality in analytical chemistry in the context of ISO/IEC-17025. Not only the theory (traceability, uncertainty, statistics, validation, use of reference materials), but also the practice. In a role playing game, they created their own company to perform analysis and they competed amongst themselves. They found out how to interact with clients. For one day, they become an accreditation technical assessor when they visited a real laboratory (the water laboratory Aquanet in Poznań). They will go out and take their own environmental samples in the Ecology Station of Jeziory.
A JRC audiovisual is available via http://youtu.be/AaT_KoFqKUc

Figure 18: Participants at the (EMIT S04-21) Euromaster in Measurement Science – Summer school, Poznań (Poland).

- **EMIT S01-23 Study visit** to the Dioxin 2011 Conference.
  - Crowne Plaza, Brussels, Belgium.
  - 21-25th August, 2011.
  - Participant: Burcu Binici (TÜBİTAK UME).

Ms. Burcu Binici attended the Dioxin 2011conference, as a study visit, during her long term traineeship at EC-JRC-IRMM. Dioxin 2011 focussed on the science of dioxins and other persistent organic pollutants following major advances in analytical determination, the understanding of emission, transport, fate, degradation, toxic behaviour, regulations, along with the growing attention in developing countries and

global pollution issues. The 2011 symposium offered a high quality scientific programme, including keynote lectures, oral and poster presentations. Some 800-1000 delegates attended the symposium, with more than 800 abstracts presented in 5 parallel sessions during the 4 days of the conference.
Dr. Binici was co-author of a poster entitled "Hexachlorobenzene and hexachlorobutadiene in fish tissue: method development for implementation of the water framework directive" presented at this symposium. Full publication details are presented in the section 3.3.2 EMIT Publications.

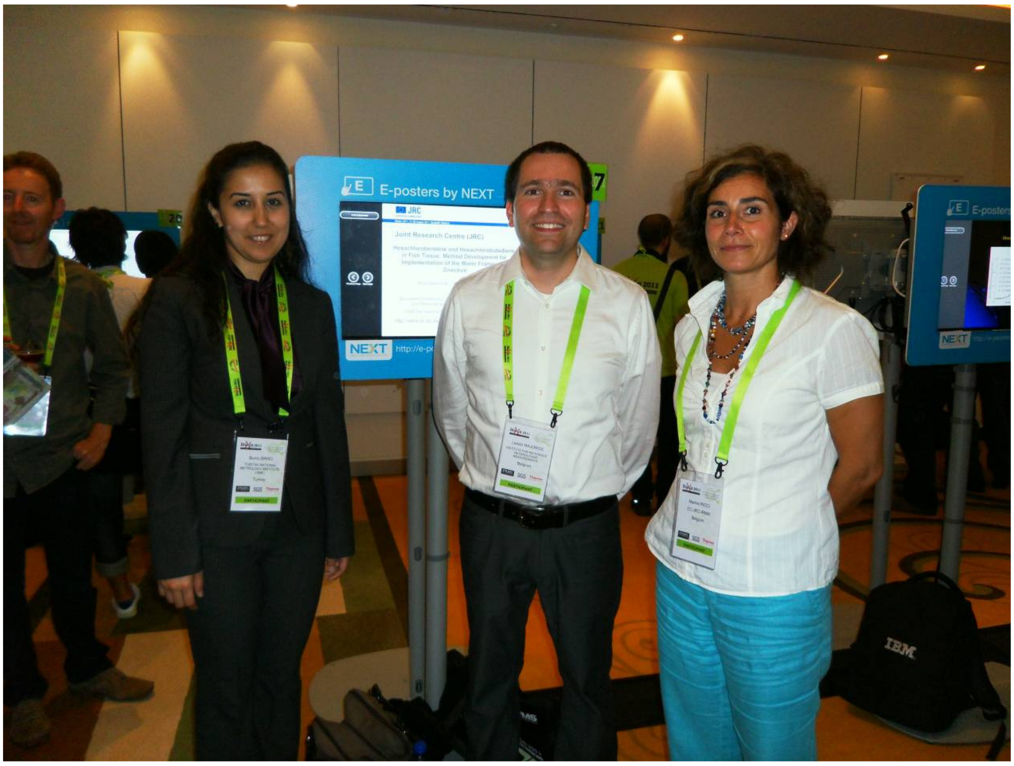


Figure 19: L-R Dr. B. Binici, Dr. L. Majoros and Dr. M. Ricci at the (EMIT S01-23) Dioxin 2011, Brussels, Belgium.

- **EMIT S03-32 Study visit** to the ALMERA gamma spectrometry workshop.
    - The workshop was entitled "Measurement of natural radionuclides in environmental samples, NORMs and TENORMs by gamma spectrometry: experimental challenges and methodologies" and took place at the IAEA Monaco Environment Laboratories, Monaco.
    - 5-9th Dec., 2011.
    - Participants: Mr. Memduh Fatih ÇINAR and Mr. Yücel Özer ÖZKÖK (TAEK-SANAEM)

The main purpose of this study visit was to use the IAEA workshop to refresh and up-date knowledge and skills in advanced aspects related to the determination of natural gamma emitting radionuclides.
This study visit resulted in knowledge gained in the following topics:

- Self-attenuation and coincidence summing for natural radionuclides
- Spectral interference for natural radionuclides
- Secular equilibrium and reference nuclides in the three natural decay series
- Detection limit and decision threshold for Ra-226 daughters in low-level samples
- NORMs and TENORMs
- Application of the concepts of exclusion, exemption and clearance for NORMs.

The lectures were given by five experts. Since the topics were theoretically detailed, there was no activity intended for application. However, an opportunity was found to discuss with the analysts from IAEA Monaco Laboratories. A better understanding of low energy, low activity gamma ray detection and correction techniques has been gained. After a discussion on the subjects covered, TAEK-SANAEM participants agreed that this training was very beneficial, especially with respect to the fact that TAEK-SANAEM are currently constructing new radiometrology laboratories including the purchase of new detection systems. TAEK-SANAEM hope to keep the contact with the IAEA experts and to get some technical aid from them while installing the new detection systems.

Figure 20: The participants of the IAEA's ALMERA gamma spectrometry workshop at which two Turkish scientists attended as a study visit under EMIT (EMIT S03-32), IAEA Monaco Environment Laboratories, Monaco.

Key points from (4th interim) Conference session (methodology I):

- **EMIT S03-19 Conference session** on "Therapy level dosimetry at National Medical Physics Congress"

    - Lecturers: Ralf-Peter Kapsch (PTB), Dr. Achim Krauss (PTB) and Dr. Doğan Yaşar (TAEK-SANAEM).
    - 18th November, 2011, Çeşme Ilıca Hotel, İzmir, Turkey.
    - Participants: 106 participants in the special session.

In the frame of the Europe and Metrology in Turkey project, a 0.5 day special session on "Therapy level dosimetry" was held on the 18th Nov. 2011 at the XIII National Medical Physics Congress, Çeşme Ilıca Hotel, İzmir, Turkey. In total ~200 participants from universities and hospitals all over Turkey attended the conference. The main topics of the conference were: Radiotherapy Physics- Radiotherapy Applications; Radiology Physics – Radiology Applications; Nuclear Medicine Physics- Nuclear Medicine Physics Applications ; Radiation Physics; Radiation Safety and Radiation Protection; Radiation Biology; Health Physics; Biomedical Applications; Medical Informatics and Magnetic Resonance Imaging.

The lectures provided as part of the EMIT session were:

- Correction for beam quality in ionizing chamber dosimetry by Dr. Ralf-Peter Kapsch (PTB).
- Calibration and quality control of reference dosimeters in radiation therapy by Dr. Doğan Yaşar (TAEK-ÇNAEM).
- *Water calorimetry as a primary calibration method in dosimetry for radiation therapy by Dr. Achim Krauss (PTB) – cancelled at the last moment for medical reasons.*

Along with the special session, two oral contributions were also presented by TAEK-ÇNAEM scientists namely:

- "ÇNAEM SSDL'inin 0,6 cc hacimli iyon odaları için Ndw kalibrasyon faktörlerinin karşılaştırma metodları ile izlenebilirliği" by Hasan EREZ, Tülin ZENGİN, Enis KAPDAN, Selim AYDIN and Muharrem KORKMAZ (TAEK-ÇNAEM)
- "IEC 61267 Standardına Uygun olarak SSDL x ışını sisteminde diagnostik x ışını radyasyon kontrollerinin oluşturulması" by Doğan YAŞAR, Tülin ZENGİN, Enis KAPDAN, Hasan EREZ (TAEK-ÇNAEM)

and two posters entitled:

- "Tedavi düzeyli dozimetre sistemleri için doz hesaplamalarında kullanılan su fantomu-Katı fantom (RW3) Doz Düzeltme faktörünün belirlenmesi" by Hasan EREZ, Tülin ZENGİN, Enis KAPDAN, Selim AYDIN and Muharrem KORKMAZ (TAEK-ÇNAEM).
- "Bilgisayarlı Tomografilerde Hasta Dozu Yönetimi" by Emin GÜNGÖR, Burhan DOĞAN and Cevdet ÖZÜAĞ (TAEK-ÇNAEM)

Figure 21: The speakers at the EMIT S04-12 conference session, held at the XIII National Medical Physics Congress, İzmir.

Key points re Conference Attendance (methodology D) preparations during the 4th interim period:

- **EMIT S02-04 Conference participation** at the 12th International Conference on Environmental Science and Technology (CEST2011)
    - Convention Centre "Marika Capsis 2000", Ixia, Rhodes Island, Dodecanisos, Greece.
    - 8-10th September, 2011
    - Participant: Erinc Engin (TÜBİTAK UME).

The conference topics were:

- Climate change and environmental dynamics
- Air pollution and control
- Water resources and river basin management
- Water treatment and reclamation

- Ecology and ecosystems management
- Wastewater and sludge treatment
- Solid waste management
- Clean energy and sustainability
- Health and environment
- Environmental management / environmental sustainability

Dr. Engin was co-author of a poster entitled " Selective determination of total Hg in soil and sewage sludge by using the Hydrea system: removing Hg memory effects" presented at this cooonference. Full publication details are presented in the section 3.3.2 EMIT Publications.
Apart from this one conference attendance (and a previous one during in March 2010), the beneficiaries have not had much time to consider availing of the conference attendance possibilities. However, all scientists and conferences have now been allocated and are summarised in Table 5.

Table 5: Conference attendance possibilities and allocations**.**

EMIT code	Conferences	Scientist / Professor	Date
S01-15a	BERM 13^, Vienna, Austria	Ms. Nilgun TOKMAN	25-29 June 2012
S01-15b	BERM 13, Vienna, Austria	Mr. Ahmet Ceyhan GÖREN	25-29 June 2012
S01-15c	BERM 13, Vienna, Austria	Mr. Müslüm AKGÖZ	25-29 June 2012
S02-04a	CEST2011, Rhodes, Greece.	Mr. Erinc ENGIN	8-10 Sep. 2011
S02-04b	BERM 13, Vienna, Austria	Ms. Kevser TOPAL	25-29 June 2012
S03-28a	IM2010, Athens, Greece.	Ms. Sema ŞEN	8-12th Mar., 2010
S03-28b	BERM 13, Vienna, Austria	Ms. Nazife ASLAN	25-29 June 2012
S03-28c	BERM 13, Vienna, Austria	Ms. Meryem SEFERINOGLU	25-29 June 2012
S04-17a	ACE 2012 (EC2E2N), Milan, Italy	Prof Mustafa DEMİR (Adnan Menderes University)	25-28 April, 2012
S04-17b	ACE 2012 (EC2E2N), Milan, Italy	Prof. Timur Dogu (METU).	25-28 April, 2012

Table 6 below shows the list of IPA EMIT Training Events, carried out during the Fourth Interim Period of the Implementation Phase (i.e. 01.07.2011 to 31.12.2011). The number of Turkish scientists who participated in training events is 337 in the fourth interim period and 1857 since the beginning.

The full list of events is annexed to this report.

Table 6: The list of IPA EMIT Training Events, carried out during the Fourth Interim Period of the Implementation Phase (i.e. 01.07.2011 to 31.12.2011).

Subject	Ref. in Gantt chart	Date	Precise topic	Event type	Duration (days)	Participants
03 Ionising Radiation Metrology	S03-30	2011-07-07	Dosimetry	Study visit to PTB (1 participant)	1	CNAEM
04 Quality, metrology education and Training.	S04-21	2011-07-10	Euromaster in Measurement Science Summer school.	3 x Study visit - Summer school, Poznan, Poland.	10	Post-graduate students from a Turkish university.
01 Reference Materials	S01-23	2011-08-21	Dioxin 2011, Brussels, Belgium (1 person)	Study visit (in Belgium).	5	LTT from TÜBİTAK UME (B. Binici)
01 Reference Materials	S01-04	2011-09-05	USE of certified reference materials (Trainers LM, TL, GA)	Workshop in Turkey	2	TÜBİTAK UME and TÜBİTAK MAM Experts (20-30 people)
02 Primary Methods of Measurement	S02-04(a)	2011-09-08	Conference participations for TUB staff : CEST 11, Rhodes, Greece. (1 person).	Conference attendance	3	TÜBİTAK UME and TÜBİTAK MAM Experts
01 Reference Materials	S01-10	2011-09-20	Planning, Preparation and Certification of reference materials.	Workshop at IRMM (21 participants)	3	TÜBİTAK UME and TÜBİTAK MAM Experts.
01 Reference Materials	S01-05	2011-10-04	PREPARATION of reference materials (PHE, JCG, LM)	Workshop in Turkey	2	TÜBİTAK UME and TÜBİTAK MAM Experts (20-30 people)
01 Reference Materials	S01-09	2011-10-06	Lectures on "Use and certification of reference materials".	3 x 1 day training visits to different places in (***Samsun***) Turkey (by L. Majoros, IRMM expert) **Seq. 3 of 3**	1	TÜBİTAK UME and TÜBİTAK MAM Experts, Universities and End Users
04 Quality, metrology education and Training.	S04-02	2011-10-18	Integrated Quality Systems: an interpretation for universities	Workshop in Uludag University, Bursa.	3	UME, MAM, universities & TAEK
S05 GENERAL	S05-09	2011-10-20	PAC Seminar - Host speakers	PAC-05 Seminar in Uludag University, Bursa.	1	Mostly PAC and university participants.
S05 GENERAL	S05-10	2011-10-27	Steering Committee Meeting (2 from IRMM)	SC-06 in TAEK-CNAEM, Istanbul.	1	Steering Committee members
03 Ionising Radiation Metrology	S03-19	2011-11-17	Conference (session) - Therapy level dosimetry	2 NMI and 2 TAEK will lecture in National Medical Physics Congress in Izmir (17-19 Nov., 2011)	5	Medical physicists from radiotherapy centers (including staff/students from universities, other end-users & Turkish institutes)
03 Ionising Radiation Metrology	S03-32	2011-12-05	ALMERA Workshop	Two TAEK scientists will attend the IAEA ALMERA workshop (Monaco) as a study visit.	5	TAEK-SANAEM

3.3 EMIT – COMMUNICATION

Various means of communicating the EMIT project are being employed. Specific websites, on the consultant's and main partner institutes (TÜBİTAK UME and TAEK-ÇNAEM and TAEK-SANAEM) have been created with a snapshot of the IRMM one shown below. Communication within the EMIT steering committee is achieved by twice yearly meetings, frequent emails and by a specially assigned interest group "JRC Metrology in Turkey" on the European Commission's secure file sharing platform, known as Circa (see 3.3.3). Other means employed for communication towards externals are the presentation of the EMIT training events (which are open to multi-stakeholders) with the means of a special poster and a flyer at as many national scientific / quality / education events in Turkey.

Raising awareness of the EMIT project's work to date and communicating upcoming events is done at every event verbally and by means of a project poster and event list flyers. Along with that, the first EMIT newsletter was published in March 2011 (in both Turkish and English). This is widely distributed by means of emailing the newsletter link (on the EMIT website[3]) and by distributing printed versions at our various events. The EMIT website is continuously being adapted to suit the growing amount of information and upcoming events are advertised 2-3 months before the event (along with emails to everyone on the EMIT contact list).

An invitation to present the status and achievements of the EMIT project was extended to us by the parallel project "Strengthening the Quality Infrastructure in Turkey" (SQIT IPA) and this was done at the Turklab conference on the 13th Dec., 2011.

[3] http://irmm.jrc.ec.europa.eu/Turkey

- McCourt J., "Improving chemical and ionising radiation metrology in Turkey – the scope and status after two years", Conformity Assessment Association of Turkey (UDDER) Journal nr 3, Dec., 2011. http://www.udder.org.tr/images/bultenler/bulten_sayi_03.pdf

The press reporting at our events helps with raising awareness of the EMIT project's activities so we don't want to discourage this. However we impress on our hosts (who may come in contact with the press) that the text describing the events should be approved by EC-JRC-IRMM's communication team, after translation by TÜBİTAK UME, TAEK-ÇNAEM, TAEK-SANAEM or the EUD, depending on the subject.

3.3.1 EMIT ON IRMM WEB SITE.

http://irmm.jrc.ec.europa.eu/Turkey

Events Tab on 06.02.2012:

EMIT workshop S04-16: Auditing of integrated management systems

20 - 22 March, 2012
İzmir, Turkey
In the frame of the Europe and Metrology in Turkey project, a 3 day workshop entitled "Auditing of integrated management systems" will be held at Dokuz Eylül Üniversitesi, İzmir for a maximum of 25 participants. Further details are available in the workshop leaflet [486Kb]. Registration will be possible from the 6 February, 2012 via the JRC Events Registration System. Deadline for registration: 27 February 2012.

EMIT workshop S03-03: Advanced gamma-ray spectrometry training course

12 – 16 March, 2012
Ankara, Turkey
Dr. Mikael Hult (JRC-IRMM), Dr. Tim Vidmar (SCK-CEN) and Dr. Michel Bruggeman will conduct a workshop on advanced gamma-ray spectrometry at TAEK-SAN
Ankara. More information, including instructions for registration, are given in the workshop leaflet [306Kb].

EMIT workshop S02-02: Principles and application of isotopic methodology and metrology in chemistry to inorganic reference measurements

28 – 30 (morning) March 2012
Kayseri, Turkey
In the frame of the Europe and Metrology in Turkey project, a 2.5 day workshop entitled "Principles and application of isotopic methodology and metrology in chemistry to inorganic reference measurements." will be held for 40-50 participants in Turkey. Further details are available in the workshop leaflet [128Kb]. Registration will be possible from the 26 January, 2012 via the JRC Events Registration System. Deadline for registration: 02 March 2012.

EMIT lectures S01-17: Seminar on Analytical Methods for the Production of Reference Materials in Organic Matrices

21 – 22 February, 2012
Adana and Mersin, Turkey
In the frame of the Europe and Metrology in Turkey project, L. Majoros (JRC-IRMM) and B. Binici (TÜBİTAK UME) will give two lectures on "Analytical Methods fo
the Production of Reference Materials in Organic Matrices" at Çukurova University, Adana on the 21 February and at Mersin University, Mersin on the 22 February.
Click here [74Kb] for more information

EMIT workshops S01-06 "Certification of Reference Materials" and S01-12 "Assignment of the Reference Value for the CRM"

31 January – 2 February 2012
Ankara, Turkey
In the frame of the Europe and Metrology in Turkey project, a three day combined workshop entitled "Certification of Reference Materials" and "Assignment of

Figure 22: Snapshot of the EMIT webpage (events tab) on the 06.02.2012.

3.3.2 EMIT PUBLICATIONS

There have been nine publications on the project in general with details of the project's progress to date:

- five reports (Inception Phase, First Interim, Second Interim, Third Interim and the Fourth Interim in progress)
  - McCourt J., Bickel M. Programme of pre-accession "Improving Chemical and Ionizing Radiation Metrology" in Turkey. Inception Phase report, JRC 57848-2010. European Union, 2010.
  - McCourt J., Programme of pre-accession "Improving Chemical and Ionizing Radiation Metrology" in Turkey. First Interim Report, JRC 61020, EUR 24549, ISBN 978-92-79-17080-5, European Union, 2010.

- McCourt J., Programme of pre-accession "Improving Chemical and Ionizing Radiation Metrology" in Turkey. Second Interim Report, JRC 64333, EUR 24776, ISBN 978-92-79-19801-4, European Union, 2011.
- McCourt J., Programme of pre-accession "Improving Chemical and Ionizing Radiation Metrology" in Turkey. Third Interim Report, JRC 67074, EUR 24957, ISBN 978-92-79-21436-3, European Union, 2011.
- McCourt J., Programme of pre-accession "Improving Chemical and Ionizing Radiation Metrology" in Turkey. Fourth Interim Report, JRC xxxxx, EUR xxxxx, ISBN xxxxxxxxxxxxxxxx, European Union, 2012 – *this report*.

- one general project poster
  - Gegevicius V., McCourt J., EMIT Events Poster, June, 2010 and

- one newsletter (two versions EN & TK)
  - McCourt J., Improving Chemical and Ionizing Radiation Metrology" in Turkey. Newsletter 01, March 2011; EN and TK versions JRC 64366.

- one article in a Turkish periodical
  - McCourt J., "Improving chemical and ionising radiation metrology in Turkey – the scope and status after two years", Conformity Assessment Association of Turkey (UDDER) Journal nr 3, Dec., 2011. http://www.udder.org.tr/images/bultenler/bulten_sayi_03.pdf

- one oral presentation
  - McCourt J., "Improving chemical and ionising radiation metrology in Turkey – the scope and status after two years" at III Laboratory Quality Conference (TURKLAB), Istanbul, 13 Dec., 2011. http://www.labkalite2011.org/docs/lqc%20turklab%202011%20programme.pdf

There are also quarterly reports, prepared by the Long Term Trainees, every three months. Due to the fact that these can contain data which may be needed for a publication, they are only exchanged with the supervisor's at the home institutes (TÜBİTAK UME and TAEK-ÇNAEM and TAEK-SANAEM).

Scientific publications[4] presented in the third and fourth interim period are:

- Poster - "Hexachlorobenzene and hexachlorobutadiene in fish tissue: method development for implementation of the water framework directive" to be presented at Dioxin 2011, Brussels, Belgium, 21-25th August, 2011.
  - Binici Gokcen B*, Majoros L., Ricci M., Held A., Emons H
  *Trainee under the IPA TR080209 project - financed by the European Union.
- Poster - "Selective determination of total Hg in soil and sewage sludge by using the Hydrea system: removing Hg memory effects" to be presented in CEST 2011, Rhodes, Greece, 8-10th September, 2011
  - Engin E.*, Santoro A., Ricci M., Held A..
  *Trainee under the IPA TR080209 project - financed by the European Union.
- Poster – "Quality Assurance Tools for Pesticide Analysis – an Ambitious Task" presented at 5th International Symposium on Recent Advances in Food Anaysis (RAFA 2011), Prague, Czech Republic, 1-4 November 2011, Marta Dabrio Ramos‡, Amadeo R. Fernández-Alba, José Fernando Huertas Pérez, Taner Gokcen*, Florian Sandor, Berit Sejeroe-Olsen, Katharina Teipel and Heinz Schimmel.
  ‡Corresponding author – E-mail: marta.dabrio@ec.europa.eu. *Trainee under the IPA TR080209 project - financed by the European Union.

[4] Publications (including posters) arising from research carried out by the long term trainees whilst in IRMM, have the an associated sentence *"Trainee under the IPA TR080209 project - financed by the European Union"* to give the correct visibility to the IPA.

- Poster – "First steps towards the production of a certified reference material for biota monitoring of hexachlorobenzene and hexachlorobutadiene" by Majoros L. , Ricci M., Binici Gokcen B*, Emteborg H., Held A. and Emons H to be presented at the ISEAC-2102, 22-25 May 2012 (International symposium on environmental analytical chemistry). *Trainee under the IPA TR080209 project - financed by the European Union.
- Certification report - "The certification of the Mass Fraction of the Total Content and the Aqua Regia Extractable Content of Hg in Loam Soil" by E. de Vos, E. Engin*, A. Santoro, M. Ricci, A. Held, EUR 25141 EN - 2011, ISBN 978-92-79-22563-5, doi:10.2787/55675, Publications Office of the European Union, Luxembourg, 2012. *Trainee under the IPA TR080209 project - financed by the European Union.
- Article - "High-resolution alpha-particle spectrometry of the ^{230}U decay series" M. Marouli, S. Pommé, J. Paepen, R. Van Ammel, V. Jobbagy, A. Dirican*, G. Suliman, H. Stroh, C. Apostolidis, K. Abbas, A. Morgenstern. Appl. Radiat. Isot. (2012), in press. *Trainee under the IPA TR080209 project - financed by the European Union.
- Article - "The use of solid angle for alpha detector efficiency in ^{226}Ra analyses of soil samples" by Abdullah Dirican*, Pınar Esra Erden, Meryem Seferinoğlu*, S. Pommé. Appl. Radiat. Isot. (2012), in press. *Trainee under the IPA TR080209 project - financed by the European Union.
- Article - "Measurement of the ^{177}Lu half-life" by S. Pommé, J. Paepen, T. Altzitzoglou, R. Van Ammel, E. Yeltepe*, Appl. Radiat. Isot. 69 (2011) 1267-1273. *Trainee under the IPA TR080209 project - financed by the European Union.
- Article - "Quantification of ^{238}Uranium in environmental samples using gamma-ray spectrometry", M. Hult, E. Andreotti, R. González de Orduña, S. Pommé, E. Yeltepe*, Atti di Conferenze/Conference Proceedings (Societá Italiana di Fisica/ Italian Physical Society) – in press. *Trainee under the IPA TR080209 project - financed by the European Union.
- Article - "Distribution of ^{60}Co in steel samples from Hiroshima" by M. Hult, G. Marissens, N. Sahin*, M. Hoshi, H. Hasai, K. Shizuma, K. Tanaka and S. Endo. Applied radiation and isotopes, in Press. *Trainee under the IPA TR080209 project - financed by the European Union.
- Report – "IMEP-31: Total arsenic, cadmium, copper, lead and mercury, as well as extractable cadmium and lead in mineral feed" by Ines Baer, Beatriz de la Calle, Inge Verbist, *Betul Ari, Agnieszka Krata, Christophe Quétel, Piotr Robouch; JRC Scientific and Technical Report; 2011, EUR 24819 EN, 64 pp. *Trainee under the IPA TR080209 project - financed by the European Union.
- Report – "IMEP-111: Total cadmium, lead, arsenic, mercury and copper and extractable cadmium and lead in mineral feed" by Beatriz de la Calle, Agnieszka Krata, *Betul Ari, Christophe Quétel, Hakan Emteborg, Piotr Robouch, Inge Verbist; JRC Scientific and Technical Report; 2011, EUR 24758 EN, 64 pp. *Trainee under the IPA TR080209 project - financed by the European Union.
- Report – "IMEP-33: Total cadmium and lead in baby food" by Fernando Cordeiro, Ines Baer, Piotr Robouch, Inge Verbist, Bibi Kortsen, Håkan Emteborg, Jean Charoud-Got, Christophe Quétel, *Süleyman Can, Beatriz de la Calle; JRC Scientific and Technical Report; 2012, EUR 25176 EN, 59 pp. *Trainee under the IPA TR080209 project - financed by the European Union.
- Report – "IMEP-113: Determination of total cadmium and lead in baby food" by Fernando Cordeiro, Ines Baer, Piotr Robouch, Inge Verbist, Bibi Kortsen, Håkan Emteborg, Jean Charoud-Got, Christophe Quétel, *Süleyman Can, Beatriz de la Calle; JRC Scientific and Technical Report; 2012, EUR 25177 EN, 52 pp. *Trainee under the IPA TR080209 project - financed by the European Union.
- Oral - "Development of a new candidate certified reference material for biota monitoring of hexachlorobenzene and hexachlorobutadiene" by Majoros L., Ricci M., Binici Gokcen B*, Emteborg H, Held A. and Emons H. presented at Dioxin 2011, Brussels, Belgium, 21-25th August, 2011. *Trainee under the IPA TR080209 project - financed by the European Union.

After the EMIT S03-17 special session, at the XIII National Medical Physics Congress, İzmir, Turkey, two oral contributions were also presented by TAEK-ÇNAEM scientists namely:

- Oral - "ÇNAEM SSDL'inin 0,6 cc hacimli iyon odaları için Ndw kalibrasyon faktörlerinin karşılaştırma metodları ile izlenebilirliği" by Hasan EREZ, Tülin ZENGİN, Enis KAPDAN*, Selim AYDIN and Muharrem KORKMAZ (TAEK-ÇNAEM) at the XIII National Medical Physics Congress, İzmir, Turkey on 19.11.2011. *Trainee under the IPA TR080209 project - financed by the European Union.

- Oral - "IEC 61267 Standardına Uygun olarak SSDL x ışını sisteminde diagnostik x ışını radyasyon kontrollerinin oluşturulması" by Doğan YAŞAR*, Tülin ZENGİN, Enis KAPDAN*, Hasan EREZ (TAEK-ÇNAEM) at the XIII National Medical Physics Congress, İzmir, Turkey on 19.11.2011. *Trainee under the IPA TR080209 project - financed by the European Union.

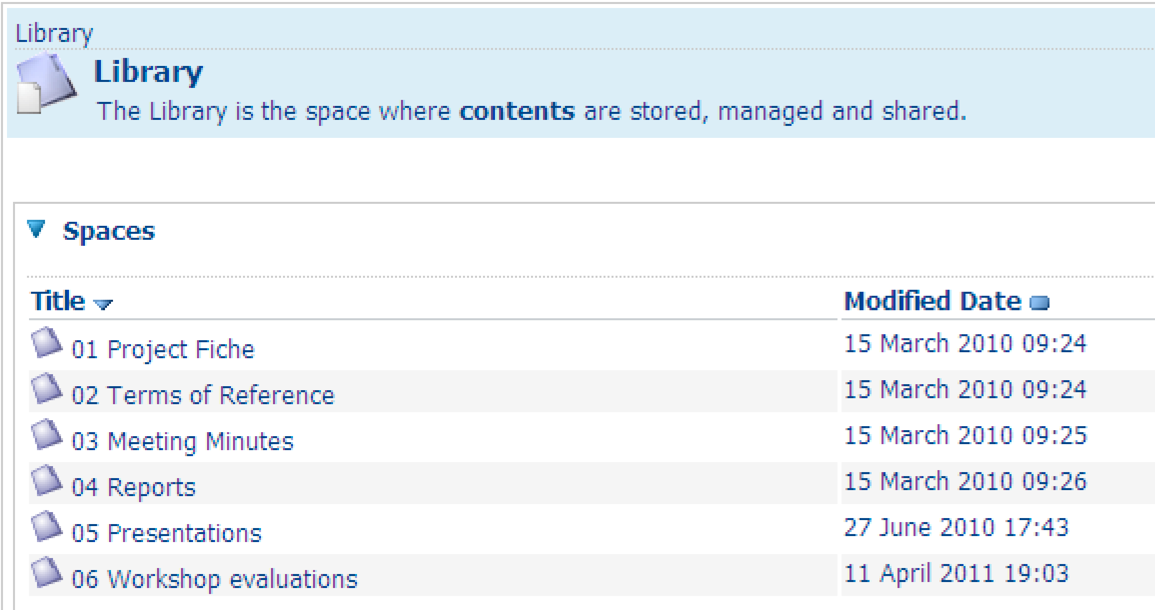
and two posters entitled:

- "Tedavi düzeyli dozimetre sistemleri için doz hesaplamalarında kullanılan su fantomu-Katı fantom (RW3) Doz Düzeltme faktörünün belirlenmesi" by Hasan EREZ, Tülin ZENGİN, Enis KAPDAN*, Selim AYDIN and Muharrem KORKMAZ (TAEK-ÇNAEM).
- "Bilgisayarlı Tomografilerde Hasta Dozu Yönetimi" by Emin GÜNGÖR, Burhan DOĞAN and Cevdet ÖZÜAĞ (TAEK-ÇNAEM)

3.3.3 CIRCABC INTEREST GROUP “JRC METROLOGY IN TURKEY”

Due to the modernisation of the secure file sharing platform, the "JRC Metrology in Turkey" secure IG had to be “migrated” from Circa to Circabc. This was carried out in January with testing and finalisation carried out by the 26.01.2012, after which all members were informed.

A screen shot of the home page of Circabc is provided here below:



3.3.4 EMIT EVENT LIST – OPEN TO MULTI-STAKEHOLDERS (ED 14)

Subject	Ref.	Date	Precise topic, duration and nr. participants foreseen.
01 RM	S01-02	2010-10-05	Workshop on preparation of certified reference materials (Turkey), 2 days, 40-50 participants.
04 QMET	S04-03	2010-10-20	Workshop "Roadmap for facilitating educational innovations in Metrology in Chemistry and Ionising Radiation" (Turkey), 1 day, 40-50 participants.
04 QMET	S04-04_09	2011-02-22	Workshop "Training methodologies in Metrology in Chemistry" (according to TrainMIC®)" (Trabzon, Turkey), 2.5 days, 40-50 participants.
01 RM	S01-03	2011-03-01	Workshop "Certification of Reference Materials" in TÜBİTAK UME premises (Turkey), 2 days, 40-50 participants.
01 RM	S01-08	2011-03-03	Lectures on "Certification of Reference Materials". İstanbul Üniversitesi & İstanbul Teknik Üniversitesi, Turkey, 1 location, 40-50 participants.
02 PMM	S02-01	2011-03-15	Workshop "Principles and application of isotopic methodology and metrology in chemistry to inorganic reference measurements" in TÜBİTAK UME (Turkey), 2.5 days, 40-50 participants.
01 RM	S01-16	2011-04-07	Lectures on "Use and certification of reference materials". Bursa Uludağ University on 7th and 2 seminars in İzmir Teknology Institute on 8th, 40-50 participants.
04 QMET	S04-14	2011-04-04	Workshop on "Safety of food & feed – requirements of an analytical laboratory", Adiyaman (Turkey), 2 days, 40-50 participants.
04 QMET	S04-13	2011-05-24	Workshop on "Metrology in Nanotechnology" (Gazi University) (Turkey), 1 day, 40-50 participants.
02 PMM	S02-05	2011-06-21	Lectures in the field of Inorganic chemical/isotopic reference measurements (Turkey), METU & Hacettepe universities, Ankara and YTE university, İzmir, 40-50 participants.
04 QMET	S04-12	2011-06-29	Conference session on the subject of education in metrology in chemistry and ionising radiation at the 25th National Chemistry Congress (Erzurum, Turkey), 0.5 days, >50 participants.
01 RM	S01-04	2011-09-05	Workshop on the use of certified reference materials (Gebze, Turkey), 2 days, 40-50 participants.
01 RM	S01-05	2011-10-04	Workshop "Preparation of reference materials" (Gebze, Turkey), 2 days, 40-50 participants.
01 RM	S01-09	2011-10-06	Lectures on "Use and certification of reference materials". Ondokuz Mayis University, Samsun (Turkey), 40-50 participants.
04 QMET	S04-02	2011-10-19	Workshop "Integrated Quality Systems: an interpretation for universities" (Uludağ University, Bursa, Turkey), 3 days, 40-50 participants.
03 IRM	S03-19	2011-11-17	Conference session on Therapy level dosimetry at the National Medical Physics Congress (Izmir, Turkey), 0.5 day, >50 participants.
01 RM	S01-06 & S01-12	2012-01-31	Workshop "Certification of reference materials" (TAEK-SANAEM, Ankara, Turkey), 2 days, 40-50 participants.
01 RM	S01-17	2012-02-21	Lectures on analytical methods for the production of reference materials in organic matrices, Çukurova University (Adana, 21 February) and Mersin University (Mersin, 22 February), Turkey, 40-50 participants.
03 IRM	S03-03	2012-03-12	Workshop (with practicals) in Advanced Gamma-ray spectrometry (TAEK-SANAEM, Ankara, Turkey), 5 days. Participation restricted to ~20 practitioners from universities and research institutes.
04 QMET	S04-16	2012-03-20	Workshop on "Auditing of integrated management systems", Dokuz Eylül Üniversitesi, İ (Turkey), 3 days. Participation restricted to 25 practitioners from TURKAK and other accredited and/or certified organisations (ot those striving for accreditation and/or certification).
02 PMM	S02-02	2012-03-28	Workshop on Isotopic methodology and metrology in chemistry to inorganic reference measurements, Erciyes University (Kayseri), Turkey, 2.5 days. Participation restricted to practitioners from research labs, control labs, industrial labs and university labs.
02 PMM	S02-06	2012-05-22	Lectures on Inorganic chemical/isotopic reference measurements, Trakya University (Edirne) on 22nd May and İstanbul University (İstanbul) on 23rd May, Turkey, 40-50 participants.
04 QMET	S04-15	2012-06-05	Workshop on "Setting up your QM system - who to train, on what, when and how?", Akdeniz University, Antalya (Turkey), 3 days. Participation is restricted to those involved in QM in research labs, control labs, industrial labs and university labs.
05 GENERAL	S05-15	11-13 June, 2012	Concluding conference (İstanbul, Turkey), 3 days, ~300 participants. VIP day 11th June, 2012. See http://irmm.jrc.ec.europa.eu/activities/Turkey/Pages/ece_emit_concluding_event.aspx
04 QMET	S04-11	2012-07-03	Workshop with practicals "Statistics; Uncertainty Budget Determination for radionuclide metrology applications" (Ege University, İzmir, Turkey), 3 days. Participation restricted to practitioners from the Nuclear Institute and other rad chem labs.
02 PMM	S02-03	*06 or 07/09/2012*	Conference session on primary methods of measurement at the 6th Analytical chemistry congress (Mustafa Kemal University, Hatay, Turkey, 0.5 day, >50 participants.
04 QMET	S04-10	2012-09-10	Workshop with practicals on proficiency testing and statistical evaluation, TÜBİTAK BUTAL, Bursa, Turkey, 2 days. Participation restricted to 40 scientists who will, or have already, take(n) part in a PT, are a PT provider or would like to be.

Abbreviations: RM = Reference Materials; PMM = Primary Methods of Measurement; IRM = Ionising Radiation Metrology; QMET = Quality, Metrology education and Training.

4 PLANNED ACTIVITIES FOR THE 5th REPORTING PERIOD 01.01.2012 – 30.06.2012

The following activities (see Table 7) are scheduled for the Fifth Interim period.

Table 7: List of IPA EMIT Events scheduled for the 5th Interim Period of the Implementation Phase (01.01.2012 – 30.06.2012).

Subject	Ref. in Gantt chart	Date	Precise topic	Event type	Duration (days)	Participant origin
01 Reference Materials	S01-06	2012-01-31	CERTIFICATION of reference materials	Workshop in Turkey (by L. Majoros, ...)	3.5	TÜBİTAK UME and TÜBİTAK MAM Experts, universities and other endusers (30-40 people)
01 Reference Materials	S01-12	2012-02-02	Assignment of the reference value for the CRM (statistical aspects)			TÜBİTAK UME and TÜBİTAK MAM Experts
01 Reference Materials	S01-17	2012-02-21	Lectures on dissemination of knowledge in the field of analytical methods for the production of reference materials in organic matrices	Seminar lectures, Çukurova University (Adana) and Mersin University (Mersin), Turkey, 40-50 participants.	2	Universities & other end-users.
03 Ionising Radiation Metrology	S03-20_23	2012-03-01	Protection level dosimetry	Lecture on portable survey meters at ÇNAEM	2	Industrial radiography workers, medical workers, TAEK staff.
03 Ionising Radiation Metrology	S03-03	2012-03-12	Workshop on Advanced Gamma-ray spectrometry	One workshop with practicals (TAEK-SANAEM labs)	5	Universities
04 Quality, metrology education and Training.	S04-16	2012-03-20	Workshop on "Auditing of integrated management systems",	Dokuz Eylul University, İzmir (Turkey), 3 days, 25 participants.	3	Practitioners from accredited/certified labs are the target audience.
S05 GENERAL	S05-11	2012-03-22	PAC Seminar - Host speakers	PAC-06 Seminar in Dokuz Eylul University, İzmir (Turkey).	1	Mostly PAC, control lab, industry and university participants.
02 Primary Methods of Measurement	S02-02	2012-03-28	Workshop on Isotopic methodology and metrology in chemistry to inorganic reference measurements	Erciyes University (Kayseri), Turkey, 2.5 days, 40-50 participants.	3	Practitioners from control labs, industrial labs and university labs (incl TÜBİTAK UME & TÜBİTAK MAM) are the target audience.
04 Quality, metrology education and Training.	S04-17(a,b)	2012-04-25	Conference participations for Turkish univ. profs (a&b=max 2); Prof. M. Demir and Prof.Dr. Timur Dogu. EC2E2N (ACE 2012), Milan.	Meant for Turkish univ. profs	4	Conf. participants.
03 Ionising Radiation Metrology	S03-09	First half 2012 (5-9th March?)	Liquid scintillation	Study visit to PTB (or SCK)	5	SANAEM
03 Ionising Radiation Metrology	S03-13	*First half 2012*	Ion chambers + RN calibrators	One expert visit from PTB (may be before or after Study Visits S03-14_15).	3	TAEK
03 Ionising Radiation Metrology	S03-14_15	*First half 2012*	Ion chambers + RN calibrators	Study visit to PTB (4 participants)	5	SANAEM
03 Ionising Radiation Metrology	S03-26	*First half 2012*	Postal Thermoluminescence dosimetry comparison applications, calibration	Study visit to PTB and dosimetry lab in Berlin.	4	ÇNAEM
03 Ionising Radiation Metrology	S03-11	*First half 2012*	Liquid scintillation, 2 - Double energetic window method for Sr-90, Pb-210 analysis with LSC	Short term training (in IRMM)	10	ÇNAEM + SANAEM
02 Primary Methods of Measurement	S02-06	2012-05-22	Lectures in the field of Inorganic chemical/isotopic reference measurements	Seminar lectures, Trakya University (Edirne, 22 May) and Selcuk University (Konya, 24 May), Turkey, 40-50 participants.	2.5	Universities & other end-users.
03 Ionising Radiation Metrology	S03-24	28/05/2012 (week 22)	X ray energy qualities, KAP meter calibration, CT ion chamber calibration	Workshop /short term training at PTB (when LTT there)	4	ÇNAEM
04 Quality, metrology education and Training.	S04-15	2012-06-05	Workshop on "Setting up your QM system - who to train, on what, when and how?",	Akdeniz University, Antalya (Turkey). Participation is restricted to those involved in QM in research labs, control labs, industrial labs and university labs.	3	Universities & other end-users.
S05 GENERAL	S05-12	2012-06-08	Steering Committee Meeting (2 from IRMM)	SC-07 in TUBITAK UME, Gebze (Turkey).	1	Steering Committee members
S05 GENERAL	S05-15	2012-06-11	CONCLUDING CONFERENCE	One conference in Turkey (3 days)	3	Participants - 300
01 Reference Materials	S01 - 22	2012-06-18	LC-MS Course, Amoeba Sciences (Berlin, Germany).	Workshop provided by external body (1 trainee)	5	TÜBİTAK
02 Primary Methods of Measurement	S02-04(b)	2012-06-25	Conference participations for TUB staff : BERM 13, Vienna, 2012 (4 people)	Conference attendance	5	TÜBİTAK UME and TÜBİTAK MAM Experts
01 Reference Materials	S01-15(b,c)					
03 Ionising Radiation Metrology	S03-28 bc	2012-06-25	Conference participations for TAEK staff (BERM 13, Vienna, 2012, 2 people)	Conference attendance	5	TAEK
01 Reference Materials	S01-11 & -20	*June/July 2012*	Study Visit of TÜBİTAK UME staff for the investigation of their needs for the prep and cert of CRMs (incl info on tech req of CRM prod equip).	Study visit to IRMM (2 people)	5	TÜBİTAK UME and TÜBİTAK MAM Experts
01 Reference Materials	S01-14 & -19	*June/July 2012*	Short term training action - advise on the arrangement of laboratories and laboratory equipment - by LTT & IRMM expert (depends on Equipment supply IPA)	Technical/study visit to TUBITAK UME: 2 d	3	TÜBİTAK

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 KEY ASSUMPTIONS

The following key assumptions, as laid out in the initial administrative agreement, are:

- Increased demand for metrological services in the field of chemical metrology and ionizing radiation due to the implementation of EU regulations and directives
- Dedication to the objectives of competent ministries and stakeholders indirectly involved in the project;
- The project is supported by a separate follow-up project by which CRMs for country specific materials are produced
- Appropriate international comparisons will be timely organized
- EURAMET will timely process TÜBİTAK UME's CMC entries submitted for inclusion into the CIPM MRA database
- TURKAK will timely process TÜBİTAK UME's application for accreditation
- Supply of equipment project is accepted and implemented
- Appropriate international comparisons will be timely organized
- EURAMET will timely process TAEK institutes' CMC entries submitted for inclusion into the CIPM MRA database
- TURKAK will timely process TAEK institutes' application for accreditation
- Available and interested Turkish laboratories' experts
- Enough interested Turkish universities for the metrology education aspects.
- Key partnerships between existing institutions, laboratories and non-governmental organizations will be established
- Awareness events will be well attended
- Project teams of this and other EU financed projects in the fields of free movement of goods, food safety and environmental, health and consumer protection (if any) will cooperate and coordinate activities

Needless to say, the failure of any of these would affect (to some degree) the successful and timely implementation of the planned activities.

5.2 RECOMMENDATIONS ADDRESSING IDENTIFIED FIELDS FOR IMPROVEMENT

5.2.1 Recommendations from the Project Advisory Committee (PAC)

The Project Advisory Committee meetings have resulted in some useful advice. The main points from the most recent advisory committee meeting have been:

<u>PAC 05 (20.10.2011), Uludag university, Bursa.</u>

Followings presentations (by Mr. O. Cankur) on the EMIT project activities to date, the audience (representing universities, national control labs, hospital labs, various TÜBİTAK and TAEK institutes) were asked to contribute suggestions as to how even more EMIT (potential) beneficiaries can be reached, some of which are listed below. General feedback on the project to date was also provided.
The suggestions (loosely translated from the audience's own words) were:

- The PAC members should be invited to the future events to be held together with PAC meeting as in PAC4 in Adıyaman.
- If even only the travel expenses of PAC members are covered, it will probably result in an increase in the participation.

- Quality is important and getting more so in recent years. Quality means dissemination of knowledge. In this respect, invitation of TURKAK assessors to such events is a good opportunity to disseminate knowledge among them (O. Cankur replied for the next relevant event, personal invitation can be sent to people at TÜRKAK)
- The production of CRM should address the market but the activities should not overlap with other producers; Textile, Environment
- In Turkey there are many laboratories equipped with modern instruments. However, the problem is related to the efficient use of those instruments which is related to the training of those people. We should come together and use them efficiently.
- Participation to Chemistry Congress in Erzurum is very important and helpful in terms of increasing awareness and becoming a well known institute
- From the beginning of the project, the progress is becoming more evident as time goes by. The activities are found to be successful to some extent. However there is a need for the selection of people who will benefit from the project and consequently will take some action in metrology field
- TÜRKAK should be included in the project events more actively
- For the selection of subjects to be covered in the EMIT events, it should be useful to check the scopes of laboratories listed in TURKAK web page
- TAEK should show some activities in the national and international events relevant to its activities
- The central laboratories in the universities need quality management systems and there are not many laboratories dealing with quality issues
- TURKAK assessors need to be trained.

5.2.2 Recommendations from the Steering Committee

The Steering Committee meetings have resulted in some useful advice. The main points from the most recent meeting have been:

<u>EMIT SC6 (27.10.2011); TAEK-ÇNAEM, Kücükcekmece, İstanbul.</u>

Following the meeting's presentations and accompanying discussions (as listed in section 3.2) a number of actions spanning all agenda topics were agreed to be executed within three months of the meeting:

- Concluding event (EMIT S05-15) preparations: IRMM, TÜBİTAK UME, TAEK and EUD to investigate which VIPs will be available to attend (and/or speak) at the concluding conference in Istanbul (week 11-15 June, 3 days). EUD to help with the media arrangements. A list to be compiled by 31.01.2012.
- In terms of raising awareness of the EMIT project in Turkey two actions were decided upon:
    - An article for the semi-annual UDDER (Conformity Assessment Association of Turkey) journal was to be prepared by IRMM (J. McCourt). This was done and submitted on the 30.11.2011. Translation into Turkish was provided by the EUD (and scientific terms checked by TÜBİTAK UME).
    - EMIT's activities were to be presented at TURKLAB's Laboratory Quality Conference in Istanbul. This was done on the 13.12.2011.
- In terms of making sure that no (further) opportunities, under the EMIT project, would be lost, the remaining names of the scientists for the conferences BERM13 and EC2E2EN were agreed to be sent to IRMM asap. This has since been done.
- To ensure a smooth organisation of the EMIT conference session on primary methods of measurement (Hatay, Sep. 2012) TÜBİTAK UME to send the name of the single point of contact in the organising committee to IRMM. Communication has recently started.

6 ANNEXES

6.1 Annex 1: Updated Logical Framework

LOGFRAME PLANNING MATRIX For The Project Fiche		Programme name and number	**Improving chemical and ionizing radiation metrology**	**Status at the end of the Third Interim Period (30.06.2011).**
		Contracting period expires : FA + 2 years	Disbursement period expires: *3 years following the end date for contracting*	
		Total Budget: EUR € 3,930,000	**IPA Budget: € 3,930,000**	
Overall objective	**Objectively verifiable indicators**	**Sources of verifications**		
The overall objective is to contribute to the better functioning of the EU-Turkey Customs Union Agreement regarding the free movement of goods as well as to facilitate the implementation of *acquis communautaire* in quality of life related areas such as environmental, health and consumer protection and food safety	- Improved implementation of harmonized legislation in the field of free movement of goods, food safety and environmental, health and consumer protection - The number of measurements linked problems related to export of products to EU countries decreased to one third of that encountered now - The number of measurements related problems reported for the domestic market decreased by one half	- European Commission Country Progress Reports - Publications of Rapid Alert System for Food and Feed - Foreign Trade Secretariat Reports - Reports by both Governmental and Non-Governmental Organizations		
Project Purpose	**Objectively verifiable indicators**	**Sources of verifications**	**Assumptions**	
To enhance institutional and measurement capacity in chemical and ionizing radiation metrology to ensure that Turkish laboratories are able to produce traceable and comparable	- TÜBİTAK UME and TAEK metrological capabilities support the implementation of the acquis, are improved and internationally recognized	- CIPM MRA CMC database - EURAMET records - TURKAK records - Individual PT providers reports - Universities information and	- Increased demand for metrological services in the field of chemical metrology and ionizing radiation due to the implementation of EU regulations and directives	

measurement results	- Turkish laboratories in chemical measurements and ionizing radiation fields and end users of CRMs better cope with measurement issues - Improved opportunities for academic education in chemical and ionizing radiation metrology - Chemical metrology topics included in the curriculum program or in the analytical chemistry courses of at least 2 universities included - Available trainers for training people in chemical metrology - The number of laboratories accredited for the chemical analysis in the field of environmental, food safety and life quality doubled - Increased metrological activities and number of PT providers as well as number of test materials -	lecture notes	- Dedication to the objectives of competent ministries and stakeholders indirectly involved in the project; - The project is supported by a separate follow-up project by which CRMs for country specific materials are produced	

Results	Objectively verifiable indicators	Sources of verifications	Assumptions	
Component 1: Institutional Capacity Building for TÜBİTAK UME: 1.1 New metrological capabilities/services in the field of chemical metrology developed and supported by documented and implemented strategies. 1.2 TÜBİTAK UME quality system integrated with a management system developed according to ISO Guides 30-35 1.3 TÜBİTAK UME chemistry laboratories prepared for accreditation as producer and supplier of CRMs to the PT providers 1.4 New calibration and measurement capabilities to support the implementation of the acquis are ready for submission to the CIPM MRA CMC database	- Validation of 5 new measurement methods developed in TÜBİTAK UME chemistry laboratories - Increased number of TÜBİTAK UME services and CMCs - New or revised quality management procedures - Submitted to EURAMET minimum 5 CMC entries for inclusion into the CIPM MRA CMC database - At least two candidate CRMs from the identified production scope released by UME - Submitted application for TÜBİTAK UME's accreditation according to ISO Guides 30-35	- TÜBİTAK UME strategy, quality management system, list of services and reports - TURKAK database - EURAMET information and the CIPM MRA CMC database	- Appropriate international comparisons will be timely organized - EURAMET will timely process TÜBİTAK UME's CMC entries submitted for inclusion into the CIPM MRA database - TURKAK will timely process TÜBİTAK UME's application for accreditation - Supply of equipment project is accepted and implemented	IRMM input - See section 3.1.1. and 3.2. TÜBİTAK UME: A draft strategic plan was sent to IRMM for review on the 5th March, 2012. Revisions (on the draft) were received from IRMM on the 13th March. IRMM: 6 LTTS at 100% completion of traineeship; 2 LTTs at 25% completion of traineeship. The completed events which supported the 62% completion rate wrt to IRMM's duty concerning this objective are S01-01, S01-13a,b, S01-02, S01-03, S02-01, S01-04, S01-10 and S01-05 The outstanding planned events which will complete IRMM's duty wrt to this objective are: S01-11, S01– 20, S01 – 19, S01-06, S01-12 and S02-02. TÜBİTAK UME: About 75% of the TÜBİTAK UME Quality Manual has been prepared. Construction of the clean labs to begin after the finalisation of the tendering procedure (Summer 2012). The most recent Technical Specification revisions were sent to the CFCU on the 23.02.2012. TÜBİTAK UME are currently awaiting a response.

Component 2: Institutional Capacity Building for TAEK: 2.1 New metrological capabilities/services in the field of ionizing radiation metrology developed and supported by documented and implemented plans and programmes 2.2 Secondary level standardisation procedures developed or improved 2.3 TAEK institutes quality management systems extended and cover the new metrological services 2.4 New calibration and measurement capabilities to support the implementation of the acquis are ready to submission to the CIPM MRA CMC database 2.5 Preparation on the development of primary standardisation available and foreseen in TAEK institutes' strategies.	– Validation of minimum two new radioactivity measurement methods at TAEK radioactivity measurement laboratories. – Validation of minimum two dosimetric measurement methods at TAEK SANAEM dosimetry laboratories – Developed/Increased number of TAEK radioactivity measurement services – Improving two radioactivity measurement methods to secondary standard level. – Improving two dosimetric measurement methods to secondary standard level – Submitted applications for the extension of accreditation of TAEK laboratories according to ISO 17025 – Submitted to EURAMET minimum 4 CMC entries for inclusion into the CIPM MRA CMC database	- TAEK institutes' strategies, quality management systems, lists of services and reports - TURKAK database - EURAMET information and the CIPM MRA CMC database	- Appropriate international comparisons will be timely organized - EURAMET will timely process TAEK institutes' CMC entries submitted for inclusion into the CIPM MRA database - TURKAK will timely process TAEK institutes' application for accreditation	Clear identification of the scope and targeted capabilities for secondary standardisation at TAEK institutes? TAEK-SANAEM: A documented draft strategic plan is complete. TAEK-ÇNAEM: - TURKAK surveillance assessment on “Air kerma calibration at Co-60 beam for Therapy level dosimeters” and “Calibration of absorbed dose to water at Co-60 beam for Therapy level dosimeters” was performed successfully on 19.12.2011 - TURKAK surveillance assessment on “Analysis of tritium in drinking water", "Cs-134 and Cs-137 analysis of foodstuff ", and "Radioactivity analysis of Ra-226, Th-232, K-40 and Cs-137 in the construction materials” will be probably held in June 2012 IRMM: 4.5 LTTs at 100% completion of traineeship. 3 LTTs at 30% of traineeship and 1 at 60%. The completed events which supported the 76% completion rate wrt to IRMM's duty concerning this objective are: S03-02, S03-06, S03-17, S03-29, S03-08, S03-16, S03-07, S03-10, S03-25, S03-27, S03-05 and S03-30. The outstanding planned events which will complete IRMM's duty wrt to this objective are S03-09, S03-13, S03-14_15, S03-20_23,

				S03-11, S03-03, S03-24, S03-26 Consultation on the development/improvement of secondary level standardisation procedures? TAEK-SANAEM: Establishment of a Secondary Standardisation Dosimetry Laboratory (SSDL) at SANAEM has been approved by TAEK Headquarters and the State Planning Office. It is in the phase of preparing the projects of the SSDL building and technical specifications of the instruments and devices to be purchased. TAEK-ÇNAEM : - Accreditation studies on "Cs-137 and x ray for protection-level dosimetry calibration" will be started in second period of 2012 - The X-ray laboratory of SSDL was not upgraded in 2011, but RQR and RQT energy series have been generated for diagnostic radiology. - Plans have been made to apply for accreditation for two new methods namely "Alpha Spectrometric Analysis of ^{234}U and ^{238}U Radioisotopes in Drinking Water" and "Gross Alpha-Beta Radioactivity Analysis In Drinking Water". IRMM: 4.5 LTTs at 100% completion of traineeship. 3 LTTs

				at 30% of traineeship and 1 at 60%. The completed events which supported the 79% completion rate wrt to IRMM's duty concerning this objective are: S03-02, S03-06, S03-12, S03-17, S03-18, S03-29, S03-08, S03-16, S03-07, S03-10, S03-25, S03-27 , S03-05, S03-30 and S03-32. The outstanding planned events which will complete IRMM's duty wrt to this objective are S03-09, S03-13, S03-14_15, S03-20_23, S03-11, S03-03, S03-24, and S03-26.
Component 3: Knowledge transfer and human resources development 3.1 TÜBİTAK UME and TAEK researchers familiar with functioning of metrology systems in EU member states with similar economic needs 3.2 TÜBİTAK UME and TAEK researchers skilled and ready to carry out the new metrological services 3.3 Turkish laboratories' experts knowledgeable how to consider metrological aspects in their activities 3.4 Turkish universities familiar with the alignment of EU university programmes in measurement science with Bologna requirements 3.5 Turkish universities interested	- 9 study visits to at least 2 EU Member States and prepared mission reports and presentations for each visit - 51 short-term trainings and consultations for TÜBİTAK UME and TAEK and for each training, a training feedback or mission reports prepared - 6 experts from TÜBİTAK UME and TAEK annually on a long-term training at JRC-IRMM and for dosimetry field, at an EU NMI - 18 seminars/workshops for the end-users and published proceedings - 10 workshops for the universities and published proceedings - Invitations to at least 20 universities on consultation of	- TÜBİTAK UME and TAEK reports and presentations - Reports from training providers - Workshop and seminar documents - TURKAK database - Universities' information database	- Available and interested Turkish laboratories' experts Interested Turkish universities	See section 3.1.3 and 3.2 Related training "events" received from IRMM: 10.5 LTTs at 100% of traineeship See entire "event" list in Annex 6.2.

in joining Euromaster Joint Degree Programme in measurement science conform to requirements	their curriculum programmes			
Component 4: Networking and Raising Awareness 4.1 European NMIs familiarized with the development of TÜBİTAK UME and TAEK's capabilities 4.2 Network of contacts in the field of metrology established, strengthened and operational 4.3 Network of contacts with universities established and strengthened 4.4 Chemical and ionizing radiation metrology topics discussed with national experts and stakeholders 4.5 International metrology community informed about TÜBİTAK UME and TAEK capabilities	- Information about the development of TÜBİTAK UME and TAEK's capabilities presented to EURAMET at TC meetings - 2 proposed joint research projects with partner organisations (other NMIs) in the field of chemical metrology - 8 coordination meetings with stakeholders in chemical and ionizing radiations metrology - Number of partner universities - 4 national conferences in chemical and ionizing radiations metrology organised - At least 10 participations of Turkish experts in international conferences and events	- EURAMET Technical Committees on Ionizing Radiations (TC-IR) and Metrology in Chemistry (TC-MC) - Minutes from the stakeholders' meetings - Minutes from meetings with universities - Conference materials - Symposiums and workshops	- Key partnerships between existing institutions, laboratories and non-governmental organizations will be established - Awareness events will be well attended - Project teams of this and other EU financed projects in the fields of free movement of goods, food safety and environmental, health and consumer protection (if any) will cooperate and coordinate activities	See section 3.1.4. and 3.2.

	Preconditions
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6.2 Annex 2: EMIT Event List

Subject	Ref. in Gantt chart	Date	Precise topic	Event type (workshop with practicals/seminar lectures/visit....)	Duration (days)	Participant origin
03 Ionising Radiation Metrology	S03-01	2009-11-25	Primary standardisation techniques in RN metrology	Workshop in Turkey	1	TAEK & from universities
03 Ionising Radiation Metrology	S03-02	2009-11-25	Gamma-ray spectrometry	Workshop in Turkey	1	TAEK & from universities
03 Ionising Radiation Metrology	S03-06	2009-11-25	Liquid scintillation	Workshop in Turkey	1	TAEK & from universities
03 Ionising Radiation Metrology	S03-12	2009-11-25	Ion chambers + RN calibrators	Workshop in Turkey	1	TAEK & from universities
03 Ionising Radiation Metrology	S03-28a	2010-01-20	Conference participations for TAEK staff (max 3); a) **Proficiency Testing Workshop**, NPL, London, U.K.	Meant for Turkish scientists (3 x 1 person at each conf.)	1	TAEK
03 Ionising Radiation Metrology	S03-28b	2010-03-08	Conference participations for TAEK staff (max 3) b) **IM2010**, Athens, Greece.	Meant for Turkish scientists (3 x 1 person at each conf.)	5	TAEK
04 Quality, metrology education and Training.	S04-01	01/04/2010 and 02/04/2010	Visit to estbalish contact with university co-ordinator of the "out-reach to universities" part of EMIT.	Visit	2	TUBITAK UME & university
01 Reference Materials	S01-01	2010-05-04	Use of certified reference materials	Workshop in Turkey (by L. Majoros, ...)	2	TÜBİTAK - 7; TAEK -9; National control labs - 8; universities -11, industry -4
01 Reference Materials	S01-07	2010-05-06	Use of certified reference materials	1 day training visit to Marmara university and Yeditepe university	2	Professors, lecturers and students: 59 at Marmara university and 22 at Yeditepe university
03 Ionising Radiation Metrology	S03-17	2010-05-10	Radiochemical lab practice (in IJS labs)	Short term training on practical lab techniques	10	TAEK & from universities (8 partic)
03 Ionising Radiation Metrology	S03-18	2010-05-20	Therapy level dosimetry	Workshop on IAEA dose protocols,	3	Medical physicists from radiotherapy centers
01 Reference Materials	S01-13	2010-06-09	Technical advise (Study Visit) of IRMM expert to TÜBİTAK UME for the investigation of their needs for the preparation and certification of CRMs (including info on technical requirements of CRM production equipment).	Training visit by IRMM expert TUBITAK UME by H. Emteborg	2	TÜBİTAK UME and TÜBİTAK MAM Experts
04 Quality, metrology education and Training.	S04-18a	2010-06-22	University outreach meeting -2/20 (Erzurum University)	Visit	3	TÜBİTAK UME & 51 Turkish universities represented (74 Turkish scientists personally addressed)
03 Ionising Radiation Metrology	S03-08	2010-09-13	Liquid scintillation	Study visit to IRMM (1 participant)	3	SANAEM
03 Ionising Radiation Metrology	S03-16	2010-09-13	Alpha-spectrometry + DSA counting	Study visit to IRMM (1 participant)	10	SANAEM
02 Primary Methods of Measurement	S02-07	2010-09-20	Advise on ToR for the clean rooms	Training visit by 2 IRMM (IM) experts to TUBITAK UME.	3	TÜBİTAK
01 Reference Materials	S01 - 21	2010-09-27	GC MS Course, Liverpool, U.K.	Workshop provided by external body (Amoeba Sciences) (1 trainee)	5	TÜBİTAK
01 Reference Materials	S01-02	2010-10-05	Processing of certified reference materials	Workshop in TUBITAK UME	2	Mostly TÜBİTAK participants expected (due to topic) but open places also available.
S05 GENERAL	S05-05	2010-10-05	PAC Seminar - EMIT Project status and FSQ talk.	PAC-03 Seminar in Yeditepe University, Istanbul. (2 IRMM experts)	1	Mostly PAC and university participants.
04 Quality, metrology education and Training.	S04-19	2010-10-06	Visit to Ataturk University, Erzurum (to prepare S04-12 Conference session).	Visit	1	Conference organising committee
S05 GENERAL	S05-06	2010-10-19	Steering Committee Meeting (2 from IRMM)	SC-04 in Ankara (TAEK-SANAEM premises).	1	Steering Committee members
04 Quality, metrology education and Training.	S04-03	2010-10-20	Roadmap for facilitating educational innovations in Metrology in Chemistry and Ionising Radiation	Workshop in Turkey (1 day)	1	2/3 places will be open for free registration (for any relevant institution or university in Turkey)
04 Quality, metrology education and Training.	S04-20	2010-10-21	IRMM participation in Turkish TrainMic (2 from IRMM)	Turkish TrainMic event	2	TUBITAK UME (71 participants - not counted in EMIT as this was organised by the National TrainMic team)
01 Reference Materials	S01-18	2010-11-23	"The Future of Reference Materials - Science & Innovation" **IRMM Symposium** participations for TUB & TAEK staff.	Seminars (F) or Workshop (E) (11 EMIT participants)	3	TÜBİTAK and TAEK scientists.

Subject	Ref. in Gantt chart	Date	Precise topic	Event type (workshop with practicals/seminar lectures/visit....)	Duration (days)	Participant origin
04 Quality, metrology education and Training.	S04-04_09	22/02/2011 - 24/02/2011	Sampling, Metrology in Chemistry, Internal QC, Applied Statistics, Method optimisation, Sel. & Use of RMs, Inter Lab comparisons….	Workshop in Karadeniz University, Trabzon, Turkey (2.5 days for 40 participants)	2.5	2/3 places will be open for free registration (for any relevant institution or university in Turkey).
01 Reference Materials	S01-03	2011-03-01	CERTIFICATION of reference materials (Trainers L. Majoros, R. Koeber, A. Lamberty).	Workshop in Turkey in TÜBİTAK UME premises	2	2/3 places will be open for free registration (for any relevant institution or university in Turkey)
01 Reference Materials	S01-08	2011-03-03	Lectures on "Certification of reference materials".	İstanbul Üniversitesi & İstanbul Teknik Üniversitesi, Turkey.	1	Open
02 Primary Methods of Measurement	S02-01	2011-03-15	PMM topics - Uncertainty, Method validation (IDMS perspective), Prim. Meth. Meas (e.g. ICP-ID-MS), Accreditation (flexible scope), Innovations in ICP-MS….	Workshop in TUBITAK UME, Gebze,Turkey	2.5	2/3 places will be open for free registration (for any relevant institution or university in Turkey)
01 Reference Materials	S01-16	2011-04-07	Lectures on "Use and certification of reference materials". (L. Majoros and E. Engin).	Seminars (F); Bursa Uludağ University on 7th and 2 seminars in İzmir Teknology Institute on 8th.	3	Universities & other end-users.
04 Quality, metrology education and Training.	S04-14	2011-04-04	Workshop on "Safety of food & feed – requirements of an analytical laboratory"	Workshop, Adiyaman University.	2	Universities & other end-users.
S05 GENERAL	S05-07	2011-04-06	PAC Seminar - Host speakers	PAC-04 Seminar in Adiyaman University, Adiyaman	1	Mostly PAC and university participants.34 at seminar lectures and 17 at PAC meeting restricted attendance).
04 Quality, metrology education and Training.	S04-13	2011-05-24	Workshop on "Metrology in Nanotechnology" (Gazi University)	Workshop	1.5	Universities & other end-users.
03 Ionising Radiation Metrology	S03-10	2011-06-06	Sample preparation and Instrument efficiency calibration in LSC	Workshop at SANAEM	3	ÇNAEM + SANAEM (restricted participation).
03 Ionising Radiation Metrology	S03-25	2011-06-07	Contamination survey meter calibration	Short term training at PTB (when LTT there) - 3 CNAEM staff	4	ÇNAEM
03 Ionising Radiation Metrology	S03-27	2011-06-17	QA/QC for therapy and diagnostic irradiation systems	Workshop /short term training	2	ÇNAEM, QA, QC responsibles from hospitals
03 Ionising Radiation Metrology	S03-05	2011-06-20	Advanced Gamma-ray spectrometry, 1 - True/Chance coincidence correction methods	Short term training (at TAEK-SANAEM)	4	ÇNAEM + SANAEM (restricted participation to 15).
02 Primary Methods of Measurement	S02-05	2011-06-21	Lectures in the field of Inorganic chemical/isotopic reference measurements. C. Quetel, S. Can, B. Ari.	Seminar lectures, Ankara, Izmir,Turkey. 40-50 participants.	2.5	Universities & other end-users.
04 Quality, metrology education and Training.	S04-12	2011-06-29	Conference (0.5 d session at the 25th National Chemistry Congress, Erzurum, Turkey)	Experts from EU and Turkey will lecture at a special session of the 25th National Chemistry Congress, Erzurum.	3	Universities, other end-users & Turkish institutes
03 Ionising Radiation Metrology	S03-30	2011-07-07	Dosimetry	Study visit to PTB (1 participant)	1	CNAEM
04 Quality, metrology education and Training.	S04-21	2011-07-10	Euromaster in Measurement Science Summer school.	Summer school, Poznan, Poland.	10	Post-graduate students from a Turkish university.
01 Reference Materials	S01-23	2011-08-21	Dioxin 2011, Brussels, Belgium (1 person)	Study visit (in Belgium).	5	LTT from TÜBİTAK UME (B. Binici)
01 Reference Materials	S01-04	2011-09-05	USE of certified reference materials (Trainers LM, TL, GA)	Workshop in Turkey	2	TÜBİTAK UME and TÜBİTAK MAM Experts (20-30 people)
02 Primary Methods of Measurement	S02-04(a)	2011-09-08	Conference participations for TUB staff : CEST 11, Rhodes, Greece. (1 person).	Conference attendance	3	TÜBİTAK UME and TÜBİTAK MAM Experts
01 Reference Materials	S01-10	2011-09-20	Planning, Preparation and Certification of reference materials.	Workshop at IRMM (21 participants)	3	TÜBİTAK UME and TÜBİTAK MAM Experts.
01 Reference Materials	S01-05	2011-10-04	PREPARATION of reference materials (PHE, JCG, LM)	Workshop in Turkey	2	TÜBİTAK UME and TÜBİTAK MAM Experts (20-30 people)
01 Reference Materials	S01-09	2011-10-06	Lectures on "Use and certification of reference materials".	3 x 1 day training visits to different places in (***Samsun***) Turkey (by L. Majoros, IRMM expert) **Seq. 3 of 3**	1	TÜBİTAK UME and TÜBİTAK MAM Experts, Universities and End Users
04 Quality, metrology education and Training.	S04-02	2011-10-18	Integrated Quality Systems: an interpretation for universities	Workshop in Uludag University, Bursa.	3	UME, MAM, universities & TAEK
S05 GENERAL	S05-09	2011-10-20	PAC Seminar - Host speakers	PAC-05 Seminar in Uludag University, Bursa.	1	Mostly PAC and university participants.
S05 GENERAL	S05-10	2011-10-27	Steering Committee Meeting (2 from IRMM)	SC-06 in TAEK-CNAEM, Istanbul.	1	Steering Committee members
03 Ionising Radiation Metrology	S03-19	2011-11-17	Conference (session) - Therapy level dosimetry	2 NMI and 2 TAEK will lecture in National Medical Physics Congress in Izmir (17-19 Nov., 2011)	5	Medical physicists from radiotherapy centers (including staff/students from universities, other end-users & Turkish institutes)

Subject	Ref. in Gantt chart	Date	Precise topic	Event type	Duration (days)	Participant origin
01 Reference Materials	S01-06	2012-01-31	CERTIFICATION of reference materials	Workshop in Turkey (by L. Majoros, ...)	3.5	TÜBİTAK UME and TÜBİTAK MAM Experts, universities and other endusers (30-40 people)
01 Reference Materials	S01-12	2012-02-02	Assignment of the reference value for the CRM (statistical aspects)			TÜBİTAK UME and TÜBİTAK MAM Experts
01 Reference Materials	S01-17	2012-02-21	Lectures on dissemination of knowledge in the field of analytical methods for the production of reference materials in organic matrices	Seminar lectures, Çukurova University (Adana) and Mersin University (Mersin), Turkey, 40-50 participants.	2	Universities & other end-users.
03 Ionising Radiation Metrology	S03-20_23	2012-03-01	Protection level dosimetry	Lecture on portable survey meters at ÇNAEM	2	Industrial radiography workers, medical workers, TAEK staff.
03 Ionising Radiation Metrology	S03-03	2012-03-12	Workshop on Advanced Gamma-ray spectrometry	One workshop with practicals (TAEK-SANAEM labs)	5	Universities
04 Quality, metrology education and Training.	S04-16	2012-03-20	Workshop on "Auditing of integrated management systems",	Dokuz Eylul University, İzmir (Turkey), 3 days, 25 participants.	3	Practitioners from accredited/certified labs are the target audience.
S05 GENERAL	S05-11	2012-03-22	PAC Seminar - Host speakers	PAC-06 Seminar in Dokuz Eylul University, İzmir (Turkey).	1	Mostly PAC, control lab, industry and university participants.
02 Primary Methods of Measurement	S02-02	2012-03-28	Workshop on Isotopic methodology and metrology in chemistry to inorganic reference measurements	Erciyes University (Kayseri), Turkey, 2.5 days, 40-50 participants.	3	Practitioners from control labs, industrial labs and university labs (incl TÜBİTAK UME & TÜBİTAK MAM) are the target audience.
04 Quality, metrology education and Training.	S04-17(a,b)	2012-04-25	Conference participations for Turkish univ. profs (a&b=max 2); Prof. M. Demir and Prof.Dr. Timur Dogu. EC2E2N (ACE 2012), Milan.	Meant for Turkish univ. profs	4	Conf. participants.
03 Ionising Radiation Metrology	S03-09	First half 2012 (5-9th March?)	Liquid scintillation	Study visit to PTB (or SCK)	5	SANAEM
03 Ionising Radiation Metrology	S03-13	*First half 2012*	Ion chambers + RN calibrators	One expert visit from PTB (may be before or after Study Visits S03-14_15).	3	TAEK
03 Ionising Radiation Metrology	S03-14_15	*First half 2012*	Ion chambers + RN calibrators	Study visit to PTB (4 participants)	5	SANAEM
03 Ionising Radiation Metrology	S03-26	*First half 2012*	Postal Thermoluminescence dosimetry comparison applications, calibration	Study visit to PTB and dosimetry lab in Berlin.	4	ÇNAEM
03 Ionising Radiation Metrology	S03-11	*First half 2012*	Liquid scintillation, 2 - Double energetic window method for Sr-90, Pb-210 analysis with LSC	Short term training (in IRMM)	10	ÇNAEM + SANAEM
02 Primary Methods of Measurement	S02-06	2012-05-22	Lectures in the field of Inorganic chemical/isotopic reference measurements	Seminar lectures, Trakya University (Edirne, 22 May) and Selcuk University (Konya, 24 May), Turkey, 40-50 participants.	2.5	Universities & other end-users.
03 Ionising Radiation Metrology	S03-24	28/05/2012 (week 22)	X ray energy qualities, KAP meter calibration, CT ion chamber calibration	Workshop /short term training at PTB (when LTT there)	4	ÇNAEM
04 Quality, metrology education and Training.	S04-15	2012-06-05	Workshop on "Setting up your QM system - who to train, on what, when and how?",	Akdeniz University, Antalya (Turkey). Participation is restricted to those involved in QM in research labs, control labs, industrial labs and university labs.	3	Universities & other end-users.
S05 GENERAL	S05-12	2012-06-08	Steering Committee Meeting (2 from IRMM)	SC-07 in TUBITAK UME, Gebze (Turkey).	1	Steering Committee members
S05 GENERAL	S05-15	2012-06-11	CONCLUDING CONFERENCE	One conference in Turkey (3 days)	3	Participants - 300
01 Reference Materials	S01 - 22	2012-06-18	LC-MS Course, Amoeba Sciences (Berlin, Germany).	Workshop provided by external body (1 trainee)	5	TÜBİTAK
02 Primary Methods of Measurement	S02-04(b)	2012-06-25	Conference participations for TUB staff : BERM 13, Vienna, 2012 (4 people)	Conference attendance	5	TÜBİTAK UME and TÜBİTAK MAM Experts
01 Reference Materials	S01-15(b,c)					
03 Ionising Radiation Metrology	S03-28 bc	2012-06-25	Conference participations for TAEK staff (BERM 13, Vienna, 2012, 2 people)	Conference attendance	5	TAEK
01 Reference Materials	S01-11 & -20	*June/July 2012*	Study Visit of TÜBİTAK UME staff for the investigation of their needs for the prep and cert of CRMs (incl info on tech req of CRM prod equip).	Study visit to IRMM (2 people)	5	TÜBİTAK UME and TÜBİTAK MAM Experts
01 Reference Materials	S01-14 & -19	*June/July 2012*	Short term training action - advise on the arrangement of laboratories and laboratory equipment - by LTT & IRMM expert (depends on Equipment supply IPA)	Technical/study visit to TUBITAK UME: 2 d	3	TÜBİTAK
04 Quality, metrology education and Training.	S04-11	2012-07-03	Statistics; Uncertainty Determination and Budget for radionuclide metrology applications *(+ expert Benedik....)*	One workshop in Turkey with practicals	3	Universities & TAEK
04 Quality, metrology education and Training.	S04-22	2012-07-12	Euromaster in Measurement Science Summer school.	3 x Study visit - Summer school, Fatima, Portugal.	10	Post-graduate students from a Turkish university.
02 Primary Methods of Measurement	S02-03	06 or 07/09/2012	Conference (0.5 d session *at* 6th National Congress of Analytical Chemistry, Turkey).	Experts from EU (NMI and/or IRMM) and UME will lecture in 6th National Congress of Analytical Chemistry, Mustafa Kemal University, Hatay, Turkey	5	Universities, other end-user labs & Turkish institutes
S05 GENERAL	S05-13	2012-09-07	PAC Seminar - Host speakers	PAC-07 Seminar in Mustafa Kemal University, Hatay, Turkey (from IRMM & UME)	1	Mostly PAC and university participants.
04 Quality, metrology education and Training.	S04-10	2012-09-10	Workshop on Proficiency testing and statistical evaluation	TÜBİTAK Butal, Bursa, Turkey, 2 days, 40-50 participants.	2	Practitioners from control labs, industrial labs and university labs (incl TÜBİTAK UME & TÜBİTAK MAM) are the target audience.
S05 GENERAL	S05-14	2012-09-18	Steering Committee Meeting (2 from IRMM)	SC-08 in TAEK-SANAEM.	1	Steering Committee members

European Commission
EUR 25337 EN – Joint Research Centre – Institute for Reference Materials and Measurements

Title: **Programme of pre-accession assistance "Improving Chemical and Ionising Radiation Metrology" in Turkey – Fourth Interim Report**

Author: Josephine McCourt

Luxembourg: Publications Office of the European Union

2012 – 76 pp. – 21.0 x 29.7 cm

EUR – Scientific and Technical Research series – ISSN 1018-5593

ISBN 978-92-79-24987-7

doi:10.2787/6068

Abstract

The overall objective of the Europe and Metrology in Turkey (EMIT) project is to contribute to the better functioning of the EU-Turkey Customs Union Agreement regarding the free movement of goods as well as to facilitate the implementation of the acquis communautaire in quality of life related areas such as environmental, health and consumer protection and food safety.

To achieve this goal the project consists of an inception phase (complete since 31.12.2009) and 4 components, which are associated with certain interventions, during the implementation phase (01.01.2010 to 30.06.2012) with the project being consolidated during the final phase (01.07.2012 to 30.09.2012).

This fourth interim report provides the overview on the project's progress for the duration of the fourth six month period of the implementation. It also offers a plan for the activities to be conducted within the fifth reporting period.

LA-NA-25337-EN-C

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Publications Office

ISBN 978-92-79-24987-7