

**Project Title**                      **Reinforcing and Further Developing a Quality Assurance/Quality Control Programme in Radiotherapy**

**Oracle Project Number**                      2060757

**Objectives**                      Reinforcement and further development of Quality Assurance/Quality Control Programme in radiotherapy in Croatia to improve quality and efficiency of radiation therapy and to avoid accidental exposure during therapeutic exposure. Since it is recognized as a long term objective graduated approach is followed: a) introduction of QA/QC systems in two major radiotherapy departments was done in the last TC cycle, but in light of major renewal of radiation therapy equipment in all radiotherapy departments in Croatia during last year there is need for further work b) awareness of QA/QC importance was recognized at national level and partially accomplished. Nevertheless, the work should be continued until complete expansion to the national level will be fulfilled.

**General Project Data**

**Field(s)**                              (29) Dosimetry and medical physics

**Project Achievements**

CRO6010 Closure Report  
Baseline of the current project, were the results of the CRO/6008 project. Procedures developed, described and implemented into two hospitals through the project CRO/6/008 were reviewed in light of new radiotherapy equipment purchased as well as advanced radiotherapy techniques implemented. Reinforcement and further development of Quality Assurance/Quality Control Programme in radiotherapy in Croatia to improve quality and efficiency of radiation therapy and to avoid accidental exposure during therapeutic exposure was the objective of the project.  
During the implementation of the project, the experts from Rijeka and Osijek disseminated reviewed procedures and protocols to other centres, since similar radiotherapy equipment was purchased for all radiotherapy departments in Croatia. The attendance of two responsible medical experts, one from Clinical Hospital Rijeka and one from University; Medical Faculty; University J.J. Strossmayer in Osijek at the conference on radiotherapy was very useful since at least two sessions per day were dedicated to the issues of QA/QC in medicine. One scientific visitor learned the design and a practical implementation of QA programme in advanced radiotherapy department, specifically in the transition from 2D to 3D CRT and implementation of IMRT. The primary objective of three practical on-the-job fellowship trainings to learn all about the introduction to a comprehensive quality assurance program in an advanced radiotherapy centre, to see how QA/QC processes should be organized which equipment to use for the purpose of QA/QC and the qualification of personnel working with that equipment. Treatments planning techniques and follow up of the patients that are on treatment were also included in the training.  
Output  
1. Radiotherapy teams from two major regional hospitals radiotherapy departments trained in advanced QA/QC procedures.  
2. Equipment QC protocols and procedures developed under CRO/6/008 were supplemented according to the new radiation therapy equipment installed.  
3. Proposed protocols were upgraded and further developed according to analyse of results of national audits performed.  
4. Radiation therapy QC procedures upgraded in two major regional hospitals according to new radiation therapy equipment installed. Upgraded equipment protocols were independently tested in pilot hospitals.  
5. National workshops organized in cooperation with relevant national professional societies and regulatory body on QA/QC in radiotherapy was already in process but postponed to later date, but partially substituted by conducting the off-site workshops by the national well trained experts, demonstrating the use of QC equipment measurements, procedures and possible benefits from implementing QA/QC systems at radiotherapy department.  
6. Internal audits were performed in order to share the experiences from the two hospitals with medical physicist and radiotherapy technologists engaged in QC in other hospitals in the country.  
7. Workgroups in front of medical physicist society were established to assist the regulatory body in implementation the radiation protection regulation related to QA/QC in radiotherapy.

8. Trained experts started to elaborate the regulatory framework in advanced QA/QC procedures for radiotherapy departments. New "Regulations about Conditions and Measures of Radiation Protection in Use of Electrical devices which Produce Ionising Radiation", demanding the implementation of QA/QC in radiotherapy were issued.

Outcome

1. QA/QC programmes in two major regional hospitals were upgraded and harmonized according to new radiation therapy equipment installed and reviewed.
2. Awareness of importance of QA/QC system for the radiation therapy treatment outcome and avoidance of accidental exposure in radiation therapy built on national level.
3. Expansion of renewed and upgraded QA/QC programme from two pilot hospitals to full national coverage using the help of professional societies and the regulatory body.

**ACC Sector**  
**Original Funding**  
**Estimated Duration**

Core  
2 year(s)

**Project Status**  
**1st Year Of Approval**

Completed on 2014-08-28  
2012

**IAEA Personnel**

<b>Programme</b>	CHUPOV, Andrei	TCEU	Europe Section 2
<b>Management Officer</b>			
<b>Section Head</b>	SALMINS, Andrejs	TCEU	Europe Section 2
<b>Technical Officer(s)</b>	HEALY, Brendan James	NAHU	Dosimetry and Medical Radiation Physics Section

**Recipient Institutes and Counterpart(s)**

Croatia	University J.J. Strossmayer; University J.J. Strossmayer; Medical Faculty; Osijek (FAJ, Dario)
Croatia	University Hospital Osijek; Department of Oncology and Radiotherapy; Osijek (KASABASIC, Mladen)
Croatia	University Clinical Hospital Rijeka; Rijeka (JURKOVIC, Slaven )

**Current Year Financial Status**

Fund	Component	Current Year Disbursement	Current Year Unliquidated Obligation	Previous Year Disbursement	Previous Year Unliquidated Obligation	Current Year Implementation	Total Implementation	Total Disbursement
	<b>Grand Total</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

**Financial Approvals**

**Core Approvals**

Year	Experts	Meetings/Workshops	Fellowships	Scientific Visits	Training Courses	HR Total	Equipment	Subcontracts	Miscellaneous	PR Total	Total Approval
2012	0.00	0.00	0.00	16,000.00	0.00	16,000.00	32,300.00	0.00	0.00	32,300.00	48,300.00
2013	9,860.00	2,350.00	6,500.00	0.00	0.00	18,710.00	31,500.00	0.00	0.00	31,500.00	50,210.00

**Footnote Approvals**

Year	Experts	Meetings/Workshops	Fellowships	Scientific Visits	Training Courses	HR Total	Equipment	Subcontracts	Miscellaneous	PR Total	Total Approval
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**Experts**

Task	Task title/Participant Name	Nationality	Candidate approached	Submitted: Accepted:a	Withdrawn:w Rejected:r	Start Date	End Date	Duration (days)
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**Meetings/Workshops**

Task	Task title/Participant Name	Nationality	Candidate approached	Submitted: Accepted:a	Withdrawn:w Rejected:r	Start Date	End Date	Duration (days)
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<b>9001</b>	<b>IRPA 13 Congress, Glasgow, Scotland</b>								<b>Field: 6A</b>
	<b>Mission 01</b> JD Submitted: 2012-04-12								
	Duty Station : Elsewhere( UK )								
	FAJ, Dario	CRO				2012-05-14	2012-05-18	4	
	JURKOVIC, Slaven	CRO				2012-05-14	2012-05-18	4	

**Fellowships**

No	Name	Nominated	Awarded: Non-awarded: Withdrawn:	Host Country	Type	Proposed: Accepted: Rejected:	Anticipated Start Date	Start Date	End Date	Proposed Duration
<b>CRO13002</b>	<b>Ms. IVKOVIC, Ana</b>	<b>2012-11-06</b>	<b>2013-01-29 a</b>	<b>AUS</b>	<b>I</b>	<b>2013-03-11 a</b>	<b>2013-05-01</b>	<b>2013-05-01</b>	<b>2013-05-31</b>	<b>00/100</b>
TC Field:	Radiation Metrology and Dosimetry(6F)(CRO13002)									
Training:	The primary objective of fellowship is to see the design and practical implementation of QA programme in a advanced radiotherapy department. She want to see how QA/QC processes are organized which equipment is being used for the purpose of QA/QC and the qualification of personel working with that equipment. Also she is interested in treatment planning techniques and followup of the patients that are on treatment.									
	The training requested is related to the IAEA's TC project entitled: Reinforcing and Further Developing a Quality Assurance/Quality Control Programme in Radiotherapy (Oracle Project Number:2060757)(CRO6010).									
Host Institute(s):	Landeskrankenhaus Salzburg; Landeskrankenhaus Salzburg; University Hospital of the Paracelsus Private Medical University; Institut für Radiotherapie und Radio-Onkologie, Salzburg									

**Scientific Visits**

No	Name	Nominated	Awarded: Non-awarded: Withdrawn:w	Host Country	Type	Proposed: Accepted:a Rejected:r	Anticipated Start Date	Start Date	End Date	Proposed Duration
<b>CRO13001</b>	<b>Mr. KASABASIC, Mladen</b>	<b>2012-10-30</b>	<b>2012-11-20 a</b>	<b>GFR</b>	<b>I</b>	<b>2012-11-28 a</b>	<b>2013-04-08</b>	<b>2013-04-08</b>	<b>2013-04-12</b>	<b>00/7</b>
TC Field:	Radiation Metrology and Dosimetry(6F)(CRO13001)									
Training:	SV for a period of one week in order to see the design and a practical implementation of QA programme in advanced radiotherapy department. He is interested in the transition from 2D to 3D CRT and implementation of IMRT The training requested is related to the IAEA's TC project entitled: Reinforcing and Further Developing a Quality Assurance/Quality Control Programme in Radiotherapy (Oracle Project Number:2060757)(CRO6010).									
Host Institute(s):	Universitätsklinikum Tübingen; Radiologische Klink, Tübingen									
<b>CRO13018</b>	<b>Mr. FAJ, Dario</b>	<b>2013-03-11</b>	<b>2013-05-17 a</b>	<b>SWE</b>	<b>I</b>	<b>2013-07-17 a</b>	<b>2013-10-14</b>	<b>2013-10-14</b>	<b>2013-10-25</b>	<b>00/14</b>
TC Field:	Radiation Metrology and Dosimetry(6F)(CRO13018)									
Training:	Introduction to a comprehensive quality assurance program in an advanced radiotherapy centre. The training requested is related to the IAEA's TC project entitled: Reinforcing and Further Developing a Quality Assurance/Quality Control Programme in Radiotherapy (Oracle Project Number:2060757)(CRO6010).									
Host Institute(s):	Lund University; Skane University Hospital, Lund									
<b>CRO13019</b>	<b>Mr. JURKOVIC, Slaven</b>	<b>2013-03-11</b>	<b>2013-05-17 a</b>	<b>SWE</b>	<b>I</b>	<b>2013-07-17 a</b>	<b>2013-10-14</b>	<b>2013-10-14</b>	<b>2013-10-25</b>	<b>00/14</b>
TC Field:	Radiation Metrology and Dosimetry(6F)(CRO13019)									
Training:	Introduction to a comprehensive quality assurance program in an advanced radiotherapy centre. The training requested is related to the IAEA's TC project entitled: Reinforcing and Further Developing a Quality Assurance/Quality Control Programme in Radiotherapy (Oracle Project Number:2060757)(CRO6010).									
Host Institute(s):	Lund University; Skane University Hospital, Lund									

**Training Courses**

**Equipment**

WP	PO Num	Total Value	Order Date	Status	Vendor Name	Vendor Location
Item	Quantity	Unit	Item Description	Planned Shipping Date	Actual Shipping Date	
1	1	each	Dosimetry equipment as per attached offer.	2013/11/30	2013/11/19	

	201206503			2012/12/12	APPROVED	EBSCO GmbH		
1	1	each	ICRU Reports 62				2012/12/21	2013/04/22
2	1	each	ICRU Reports 64				2012/12/21	2013/04/22
3	1	each	ICRU Reports 85a				2012/12/21	2013/04/22
	201206502			2012/12/12	APPROVED	EBSCO GmbH		
1	1	each	Measurement Quality Assurance for Ionizing Radiation Dosimetry (ICRU Report 76)				2012/12/21	2013/04/22
2	1	each	Prescribing, Recording, and Reporting Intensity-Modulated Photon-Beam Therapy (IMRT)(ICRU Report 83)				2012/12/21	2013/04/22
	201304372			2013/08/22	APPROVED	CIRS - Computerized Imaging Reference Systems, Inc.		
1	0.927167	each	Dosimetry equipment as per attached offer .				2013/11/30	2013/11/12
1	0.072832	each	Dosimetry equipment as per attached offer .				2013/11/30	2013/11/12
	6							
	201300282			2013/01/21	APPROVED	Standard Imaging, Inc.		
1	1	lot	QC3 phantom and PIPS Pro software as per attached offer.				2013/03/15	2013/02/11
	201304623			2013/09/04	APPROVED	CANBERRA PACKARD Central Europe GmbH		
1	1	each	Dosimetry equipment as per attached offer.				2013/11/30	2013/11/19
	201305099			2013/09/26	APPROVED	CIRS - Computerized Imaging Reference Systems, Inc.		
1	1	each	Dosimetry equipment as per attached quotation .				2013/11/30	2013/10/21
	201300708			2013/02/12	APPROVED	CANBERRA PACKARD Central Europe GmbH		
1	1	each	UNIDOS weblin, Cat. T10022				2013/05/25	2013/05/28
2	1	each	QUICKCHECK weblin w/o docking station, Cat. L981975. Transport and Handling Euro 180.00 included in the item's price.				2013/05/25	2013/05/28
	201304626			2013/09/04	APPROVED	IBA DOSIMETRY GmbH		
1	1	each	Dosimetry equipment :				2013/10/30	2013/11/08
	201300415			2013/01/25	APPROVED	IBA DOSIMETRY GmbH		
1	1	lot	Set of phantoms as follows :				2013/03/25	2013/03/25
	201305082			2013/09/25	APPROVED	CNMC Company Inc.		
1	1	each	MINI CT QC PHANTOM				2013/11/30	2014/02/27
	201305097			2013/09/26	APPROVED	CNMC Company Inc.		
1	1	each	MINI CT QC PHANTOM , Model 76-430.				2013/11/30	2014/01/21

**Sub-contracts**

WP	PO Num	Unit	Total Value	Order Date	Status	Vendor Name	Vendor Location	
Item	Quantity	Unit	Item Description				Planned Shipping Date	Actual Shipping Date

**Training Courses**

WP	PO Num	Unit	Total Value	Order Date	Status	Vendor Name	Vendor Location	
Item	Quantity	Unit	Item Description				Planned Shipping Date	Actual Shipping Date

**Others**

WP	PO Num	Unit	Total Value	Order Date	Status	Vendor Name	Vendor Location	
Item	Quantity	Unit	Item Description				Planned Shipping Date	Actual Shipping Date

1	FTS-35573	1000	each	2014/01/28	APPROVED	Region Skane		
						SupplierNumber:31485 FAJ, MR.. Dario  Non Staff		
1	FTS-23238	650	each	2013/02/04	APPROVED	GIZ - Deutsche Gesellschaft fuer Internationale		
						1064238 KASABASIC, Mr. Mladen Staff Placement Fee		
1	FTS-32353	1000	each	2013/10/23	APPROVED	Lund University; Skane University Hospital- Department		
						SupplierNumber:31485 FAJ, MR.. Dario  Non Staff		
1	A1306578-1525EUR	761.87	each	2013/04/04	APPROVED	American Express Services Europe Limited,		
						13FT06578 576135 IVKOVIC, MS. ANA Osijek (CRO) - Salzburg (AUS) - Osijek		
1	A1311953-1525EUR	395.86	each	2013/09/11	APPROVED	American Express Services Europe Limited,		
						13ST11953 40628 FAJ, MR. DARIO Zagreb (CRO) - Lund (SWE) - Zagreb (CR		
1	FTS-23237	1924	each	2013/02/04	APPROVED	United Nations Development Program		
						1064238 KASABASIC, Mr. Mladen Staff DSA: GFR(Tübingen), 8 - 12 Apr 2013, 6 nights @ \$304=\$1824 Contingency, 1 country, \$100		
1	A1311954-1525EUR	395.86	each	2013/09/11	APPROVED	American Express Services Europe Limited,		
						13ST11954 19102 JURKOVIC, MR. SLAVEN Zagreb (CRO) - Lund (SWE) - Zagreb (CR		
1	EMS-14163	2981	each	2012/05/02	APPROVED	FAJ, Mr Dario		
						510703 FAJ, Mr. Dario  Staff FAJ, Dario (Duty Travel Non Staff for TC Projects)		

FTS-30402					2013/09/10	APPROVED	JURKOVIC, Mr Slaven
1	3504	each	SupplierNumber:17636	JURKOVIC, . Slaven	Non Staff		
2	665	each	SupplierNumber:17636	JURKOVIC, . Slaven	Non Staff		
FTS-30400					2013/09/10	APPROVED	FAJ, Mr Dario
1	4169	each	SupplierNumber:31485	FAJ, Dario	Non Staff		
FTS-32352					2013/10/23	APPROVED	Lund University; Skane University Hospital- Department
1	1000	each	SupplierNumber:17636	JURKOVIC, MR.. Slaven	Non Staff		
A1301006-1525EUR					2013/02/05	APPROVED	American Express Services Europe Limited,
1	813.62	each	13ST01006	580117 KASABASIC, MR. MLADEN Osijek (CRO) -Tuebingen (GFR) - Osijek (			
FTS-24997					2013/04/04	APPROVED	United Nations Development Program
1	3831	each	SupplierNumber:47651	IVKOVIC, Ana	Non Staff		
FTS-35575					2014/01/28	APPROVED	Region Skane
1	1000	each	SupplierNumber:17636	JURKOVIC, MR.. Slaven	Non Staff		
EMS-14164					2012/05/02	APPROVED	JURKOVIC, Mr Slaven
1	2981	each	71984	JURKOVIC, Mr. Slaven Staff JURKOVIC, (Duty Travel Non Staff for TC Projects)			