

Project Title	Radiation Processing Applications for Health and the Environment (RCA)
Oracle Project Number	
Objectives	To apply radiation processing to natural polymers for use in the health and environment sectors. To establish radiation processing technology for environmental purposes. To transfer radiation processing technology to end users and promote its use in the health and environment sectors.

General Project Data

Field(s)	(8H) Radiation Processing Facilities and Applications
APC Code(s)	(12) Radiation Technology for Industrial Applications and a Safer Environment
Project Achievements	<p>BACKGROUND</p> <p>Radiation technology that utilizes gamma ray or X ray sources and electron accelerators is one of the cleanest and most reliable processes, widely applied today, for material modification. Ionizing radiation is well known for its beneficial capacity to crosslink, degrade and generate free radicals, and reducing and oxidizing species in materials.</p> <p>It is the manipulation of these properties that has resulted in the development of radiation processing applications, which most of the RCA countries are familiar with. In the field of new materials development, it is foreseen that natural polymers, composites and nano materials will become major technologies in the near future, with radiation processing playing an important role. As well as being abundant in the Asia Pacific region, natural polymers are recyclable and can be used as raw material in health care products. The obvious advantages of their use include economics, efficacy, and environmental conservation. Past RCA projects have led to several applications involving the radiation processing of natural polymers related to agriculture, human health, and the environment. While some of these products are now fully developed and commercialized (hydrogel dressings, for example), several new commercially valuable products for health and the environment are still being developed. One problem that is becoming more and more important for the RCA region is environmental protection. While electron beam facilities for electron beam flue gas and wastewater treatment have been constructed in China and the Republic of Korea, and a gamma sludge irradiator is in operation in India, these technologies are far from having been exploited in all the Member States.</p> <p>OUTPUTS</p> <p>Three meetings were organized in the framework of the project, namely, a project planning meeting, a mid-term review meeting, and a regional executive management meeting for policy makers and entrepreneurs. The project also provided financial support to nine national experts to attend the Forum for Nuclear Cooperation in Asia (FNCA) Workshop on Radiation Processing of Natural Polymers held in Shanghai, China and Ho Chi Minh City, Vietnam. In addition, 66 participants attended the following three regional training courses (RTCs): i) RTC on the promotion of radiation technology utilization; ii) RTC on radiation processing for basic and medium level personnel; and iii) RTC on applications of nanotechnology.</p> <p>Participants of the RTCs acquired knowledge regarding the increasing role of radiation technology in health care applications, the production of value-added products from synthetic and natural polymers materials and they also learned about the technical, economic and social advantages of using radiation. Knowledge on the perspective of radiation processing to support the activities undertaken by the participating Member States in developing and commercializing new products from radiation processed natural polymers as applied to health and environment was also transferred during one of the RTCs. Participants also gained knowledge on the general concepts of nanotechnology, radiation technology (gamma, electron beam and X rays irradiators).</p> <p>The project planning meeting was organized to plan the implementation of the project and the meeting also reviewed the progress of the RCA project RAS/8/098, 'Radiation Technology for Development of Advanced Materials for Protection of Health and the Environment' (2005-2006), discussed means of collaboration between RCA and the FNCA in radiation processing and prepared the draft concept paper of the project proposal for the 2009-2011 TC cycle.</p>

The Regional Executive Management Meeting was attended by the project technical officer, 11 experts from Canada, Japan, Malaysia and the Republic of Korea, including 21 representatives from Bangladesh (2), China (1), India (1), Indonesia(2), Malaysia (2), Mongolia(1), Myanmar (2), Pakistan(1), Philippines (2), Republic of Korea (1), Sri Lanka (2), Thailand (2) and Vietnam (2) representing Research Institutions, Governmental authorities and private companies. The Meeting discussed the steps for promoting wider utilization of radiation technology for health and the environment with focus on technology transfer and commercialization and the approach to be taken with the policy makers and entrepreneurs.

OUTCOMES

Newly developed and price competitive novel products from the radiation processed natural polymers for health and environmental applications will become available and at least eight new price competitive products were developed within the five years.

The following countries have developed new products: Bangladesh, China, India, Indonesia, Japan, Malaysia, Philippines, Pakistan, the Republic of Korea, Sri Lanka, Thailand, and Vietnam.

Bangladesh has developed a hydrogel wound dressing that can be used to treat a variety of clinical complications following burns. China has developed the technology of using irradiated oligo chitosans, a waste product, for fish feed. The product is being tested by the end-users for an anti virus test of fish and shrimp, before the commencement of commercial production. China has also developed polysaccharide based hydrogels for wound dressing and the technology is being transferred to a private company. Nano silver particles have been prepared by electron beam irradiation with a low melting point (128oC) compared to metallic silver (980oC). Discussions are in progress with a semiconductor factory to test the properties of the products.

Approximately 600 tons of irradiated, hygienised, enriched sludge were supplied to farmers in India for actual field trails under a programme to promote radiation technology in hygienizing sewage sludge and its utilization as useful manure. India also has developed a polyvinyl acetate (PVA) based hydrogel and the technology has been transferred to a private company.

A memorandum of understanding (MoU) has been signed between the National Nuclear Energy Agency of Indonesia (CAIR-BATAN) and a private industry (PT. Eracita Astamida) for the development and eventual commercialization of hydrogel for wound dressing. Indonesia was also engaged in the synthesis and characterization of Hydroxyapatite-polymers (HA) composites for bone substitute application for periodontal purposes.

Japan has developed a hydrogel from polysaccharides that can be used as Japanese traditional paper and as metal ion adsorbents. It is in the process of developing 2 new products and a third product was transferred to a private company (Wakayoshi Optical Industry Co.Ltd.)

The Republic of Korea has developed a hydrogel patch with natural herbal extracts (NHEB-02) using gamma irradiation as a remedy for atopic dermatitis (AD), which is a chronic inflammatory skin disease that affects a large number of children and adults in industrialized countries. This technology was transferred to a private company (Agabang Co.)

Malaysia has also developed hydrogels in sheets and paste from biomedical grade chitosan derivatives for wound dressing. These products have been evaluated through in vitro and in vivo animal models methods and were found to be non-toxic, biocompatible and efficacious in the treatment of wounds. Pre-commercial trials, which involved pilot scale production and market acceptance tests have been carried out.

Pakistan was also engaged in the modification of indigenously extracted chitin / chitosan using gamma radiation for medical and environmental applications. The hydrogel developed shows pH responsive behaviour and can be used as a drug delivery application. It also can be used as an adsorbent for the removal of toxic metals.

The PVP-carrageenan hydrogel for wound dressing developed in the Philippines has been patented by the Philippine Patent Office (Patent No. 1-2000-2471 issued on October 28, 2008 for 20 years.) and Sri Lanka has completed the development of a PVP based hydrogel wound dressing and has commenced clinical trials.

Thailand has developed a PVA/Thai silk fibroin hydrogel wound dressing, which is expected to be patented. Several other products are under development at research level.

Vietnam has produced a plant growth promoter named "T&D" and a plant protector "OLICIDE" which have been commercialized with a production capacity of 20 to 30 tons/ year. Twenty-eight tons of super water absorbents are being produced per year for domestic use and export. A graft copolymer has been prepared for the application in the enhancement of oil recovery. The techno-economic feasibility of application in oilfields has been completed. Pilot scale production of this product is planned in collaboration with a Joint Venture Company.

Another outcome of this project is a higher utilization of available radiation processing facilities for health and environmental control process, shown by an increase of the throughput of the irradiation facilities:

The through put of the irradiation facilities of almost all the countries have increased as a result of the development of new products.

There has also been increased investment in radiation technology, shown by the increase in the capital investment in radiation facilities. The following countries increased the capital investment in radiation facilities: Bangladesh, India, Indonesia, Malaysia, Philippines, Sri Lanka, Thailand, and Vietnam.

A multipurpose radiation facility of 350 kCi is being constructed under financial support of the Government of Bangladesh, which will also be used for the irradiation of Chitosan for hydrogel production. Pilot scale production of chitosan/chitin is being carried out in using indigenous prawn/shrimp shells.

India has increased the Co-60 sources activity of the irradiator used for the irradiation of natural polymers from 160 kCi to 375 kCi and the plant is being run on a round the clock basis. Daily, 2.5 tons of dry sludge is being hygeinized. India has also installed 3 new multipurpose irradiation facilities, which will be also used for irradiation of natural polymers. .

Indonesia also has invested in increasing the Co-60 sources activity and Malaysia has increased the investment in gamma and electron beam (EB) facilities and in the production of sago hydrogel.

A pilot plant has been installed in the Philippines for the production of hydrogel for wound dressing, which is to be marketed in collaboration with a Private Company (Biotecos). The Philippines has also upgraded the irradiation facility and increased the Co-60 source activity.

The Government of Sri Lanka has allocated funds to establish a Multipurpose Gamma Irradiation Facility that will be used for medical products sterilization, food irradiation and the large scale production of products such as hydrogels.

Thailand has installed a new gamma cell for R&D and one industrial gamma irradiation facility and Vietnam has increased the activity of Co-60 sources in the gamma

ACC Sector	irradiation facility and installed a new Electron Beam machine.	Project Status	Completed on 2010-02-12
Original Funding	Core	1st Year Of Approval	2007
Estimated Duration	2 year(s)		

IAEA Personnel

Programme Management Officer	SUKASAM, Kesrat	Asia and the Pacific Section 1
Section Head	MAKSOUDI, Mokdad	Asia and the Pacific Section 1
Technical Officer(s)	DE OLIVEIRA SAMPA, Maria Helena	Radioisotope Products and Radiation Technology Section

Recipient Institutes and Counterpart(s)

Bangladesh	Bangladesh Atomic Energy Commission (BAEC); Atomic Energy Research Establishment (AERE); (AKHTAR, Feroza)
China	Peking University; Institute of Applied Chemistry; (ZHAI, Maolin)
India	Department of Atomic Energy (DAE); Department of Atomic Energy (DAE); Bhabha Atomic Research Centre (BARC); Radiation Technology Division; Radiation Technology Development Section; (BHARDWAJ, Yatender Kumar)
Indonesia	National Nuclear Energy Agency -BATAN; Centre for Research and Development of Isotopes and Radiation Technology; (DARWIS, Darmawan)
Japan	Japan Atomic Energy Agency; Japan Atomic Energy Agency -JAEA-;Takasaki Radiation Chemistry; Research Establishment; Department of Material Development; Environmental Functional Materials Laboratory; (TAMADA, MASAO)
Malaysia	Ministry of Science, Technology and Innovation - Malaysia, Kajang; Ministry of Science, Technology and Innovation; Malaysian Nuclear Agency; Ministry of Science, Technology and Innovation; Malaysian Nuclear Agency; Division of Radiation Processing Technol; (MOHD DAHLAN, Khairul Zaman Bin HJ)
Mongolia	National University of Mongolia; Nuclear Research Center, National University of Mongolia; (PUREV, Zuzaan)
Myanmar	Ministry of Science and Technology; Division of Atomic Energy - Yangon, Myanmar; (YU, San San)
Philippines	Philippine Nuclear Research Institute (PNRI); (ABAD, Lucille Velez)
Sri Lanka	Atomic Energy Board of Sri Lanka; Radiation Processing Section; (KULATUNGE, Samantha Samalatha)
Thailand	Ministry of Science and Technology MOST, Bangkok; Office of Atoms for Peace (OAP); (KEWSUWAN, Prartana)
Viet Nam	Vietnam Atomic Energy Commission VAEI; (HOANG, Hoa Mai)
Viet Nam	Ministry of Science and Technology (MOST); Vietnam Atomic Energy Institute VINATOM; Nuclear Research Institute (NRI); (LE, Hai)

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
		Grand Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Financial Approvals

Core Approvals

Year	Experts	Meetings/Workshops	Fellowships	Scientific Visits	Training Courses	HR Total	Equipment	Subcontracts	Miscellaneous	PR Total	Total Approval
2007	33,860.00	32,500.00	0.00	0.00	114,000.00	180,360.00	0.00	0.00	0.00	0.00	180,360.00
2008	14,553.00	105,000.00	0.00	0.00	0.00	119,553.00	0.00	0.00	0.00	0.00	119,553.00

Footnote Approvals

Year	Experts	Meetings/Workshops	Fellowships	Scientific Visits	Training Courses	HR Total	Equipment	Subcontracts	Miscellaneous	PR Total	Total Approval
2007	0.00	0.00	0.00	0.00	57,000.00	57,000.00	0.00	0.00	0.00	0.00	57,000.00

Experts

Task	Task title/Participant Name	Nationality	Candidate approached	Submitted:s Accepted:a	Withdrawn:w Rejected:r	Start Date	End Date	Duration (days)	
01	Participation in the FNCA Workshop								Field: 8H
	Mission 01 JD Submitted: 2007-08-28								
	Duty Station : Ho Chi Minh City(VIE)								
	ABAD, Lucille Velez	PHI	2007-09-05	2007-09-28a		2007-10-22	2007-10-26	4	
	KULATUNGE, Samantha Samalatha	SRL		2007-09-28a		2007-10-22	2007-10-26	4	
	YASIN, Tariq	PAK		2007-09-28a		2007-10-22	2007-10-26	4	
	HEGAZY, El-Sayed Ahmed	EGY	2007-09-06	2007-09-28a		2007-10-22	2007-10-26	4	
	AbdElAziz FRANCIS, Sanju	IND		2007-09-28a		2007-10-22	2007-10-26	4	
02	Participation in the FNCA Workshop on "Radiation Processing of Natural Polymers"								Field: 8H
	Mission 01 JD Submitted: 2008-09-22								
	Duty Station : Shanghai(CPR)								
	YASIN, Tariq	PAK				2008-10-27	2008-10-31	4	
	KULATUNGE, Samantha Samalatha	SRL				2008-10-27	2008-10-31	4	
	ABAD, Lucille Velez	PHI	2008-09-30			2008-10-27	2008-10-31	4	

Task	Task title/Participant Name	Nationality	Candidate approached	Submitted:s Accepted:a	Withdrawn:w Rejected:r	Start Date	End Date	Duration (days)	
	RAMNANI, Satish Parsran	IND				2008-10-27	2008-10-31	4	
<u>Meetings/Workshops</u>									
Task	Task title/Participant Name	Nationality	Candidate approached	Submitted:s Accepted:a	Withdrawn:w Rejected:r	Start Date	End Date	Duration (days)	
9001	Project Planning Meeting of RAS/8/106 Mission 01 JD Submitted: 2007-03-13 Duty Station : Bangkok(THA)								Field: 8H
	ABAD, Lucille Velez	PHI	2007-03-19			2007-04-23	2007-04-27	4	
	AKHTAR, Feroza	BGD	2007-03-19			2007-04-23	2007-04-27	4	
	PONGPAT, Suchada	THA				2007-04-23	2007-04-27	4	
	PRASATSRISUPAB, Jariya	THA				2007-04-23	2007-04-27	4	
	BHARDWAJ, Yatender Kumar	IND	2007-03-19			2007-04-23	2007-04-27	4	
	DIAS, Mahendra Prinath	SRL				2007-04-23	2007-04-27	4	
	KULATUNGE, Samantha Samalatha	SRL	2007-03-19			2007-04-23	2007-04-27	4	
	MOHD DAHLAN, Khairul Zaman Bin HJ	MAL	2007-03-19			2007-04-23	2007-04-27	4	
	YASIN, Tariq	PAK	2007-03-19			2007-04-23	2007-04-27	4	
	MOE MIN HTWE, .	MYA	2007-03-19			2007-04-23	2007-04-27	4	
	ZHAI, Maolin	CPR	2007-03-19			2007-04-23	2007-04-27	4	
	KEWSUWAN, Prartana	THA				2007-04-23	2007-04-27	4	
	HOANG, Hoa Mai	VIE	2007-03-19			2007-04-23	2007-04-27	4	
	PAKKONG, Pannee	THA				2007-04-23	2007-04-27	4	
	DE OLIVEIRA SAMPA, Maria Helena	BRA				2007-04-23	2007-04-27	4	
9002	Mid-Term Progress Review Meeting Mission 01 JD Submitted: 2008-02-15 Duty Station : Quezon City(PHI)								Field: 8H
	DE OLIVEIRA SAMPA, Maria Helena	BRA				2008-04-07	2008-04-11	4	
	NHO, Young-Chang	ROK				2008-04-07	2008-04-11	4	
	LE, Hai	VIE				2008-04-07	2008-04-11	4	
	SARMA, Kuppa Sivasankara	IND				2008-04-07	2008-04-11	4	
	BIN HASHIM, Kamaruddin	MAL				2008-04-07	2008-04-11	4	
	KEWSUWAN, Prartana	THA				2008-04-07	2008-04-11	4	

Task	Task title/Participant Name	Nationality	Candidate approached	Submitted:s Accepted:a	Withdrawn:w Rejected:r	Start Date	End Date	Duration (days)		
9003	YASIN, Tariq	PAK				2008-04-07	2008-04-11	4	Field: 8H	
	NAGASAWA, Naotsugu	JPN				2008-04-07	2008-04-11	4		
	DARWIS, Darmawan	INS				2008-04-07	2008-04-11	4		
	KULATUNGE, Samantha	SRL				2008-04-07	2008-04-11	4		
	Samalatha									
	XU, Gang	CPR				2008-04-07	2008-04-11	4		
	OO, ZAW LIN	MYA				2008-04-07	2008-04-11	4		
	AKHTAR, Feroza	BGD				2008-04-07	2008-04-11	4		
	ABAD, Lucille Velez	PHI				2008-04-07	2008-04-11	4		
	Regional Executive Management Meeting for Policy Makers and Entrepreneurs									
	Mission 01 JD Submitted: 2008-07-04									
	Duty Station : Takasaki(JPN)									
	ABIDIN, Zainal	INS	2008-07-21				2008-12-08	2008-12-12		4
	CALIX, Virginia-Soriano	PHI	2008-07-21				2008-12-08	2008-12-12		4
	SHAH, Mahesh	IND	2008-07-21				2008-12-08	2008-12-12		4
	WIENS, Richard A.	CAN			2008-10-15w					
	LING, Chee Hiang	MAL	2008-07-21				2008-12-08	2008-12-12		4
	JUNHASAVASDIKUL, Banja	THA	2008-07-21		2008-10-10w					
	WICKRAMATHILAKE, E.R.	SRL	2008-07-21				2008-12-08	2008-12-12		4
	Chamari Sisitha									
	KIM, Jin-Hyung	ROK			2008-10-15w		2008-12-08	2008-12-12		4
	SUMARDI SUHENDRA, Edhie	INS	2008-07-21				2008-12-08	2008-12-12		4
	CEBUMA, Arturo	PHI	2008-07-21				2008-12-08	2008-12-12		4
	BEERS, Eric	CAN					2008-12-09	2008-12-10		1
	SILPSRIKUL, Orawee	THA					2008-12-08	2008-12-12		4
	KATSUMURA, Yosuke	JPN					2008-12-08	2008-12-08		0
	WILSON WIJERATNAM, Romola Shanthi	SRL	2008-07-21				2008-12-08	2008-12-12		4
	XU, Ling	CPR	2008-07-21				2008-12-08	2008-12-12		4
	MOHD DAHLAN, Khairul Zaman Bin HJ	MAL	2008-07-28				2008-12-08	2008-12-12		4
	DAMDINSUREN, Tseren	MON	2008-07-21				2008-12-08	2008-12-12		4
	MALIK, Ghazanfar Sadiq	PAK	2008-07-21				2008-12-08	2008-12-12		4
	PARK, Sung-Hyun	ROK	2008-07-21				2008-12-08	2008-12-12		4
	HAN, Bum Soo	ROK	2008-07-28				2008-12-08	2008-12-12		4
	KUME, Tamikazu	JPN					2008-12-09	2008-12-09		0
BIN HASHIM, Kamaruddin	MAL	2008-07-21				2008-12-08	2008-12-12	4		

Task	Task title/Participant Name	Nationality	Candidate approached	Submitted:s Accepted:a	Withdrawn:w Rejected:r	Start Date	End Date	Duration (days)
	OO, Daw Mar Mar		2008-07-21			2008-12-08	2008-12-12	4
	MEHMOOD, Mazhar	PAK	2008-07-21		2008-11-19w			
	OO, Lei Lei	MYA	2008-07-21			2008-12-08	2008-12-12	4
	NGUYEN NGOC, Khang	VIE	2008-07-21			2008-12-08	2008-12-12	4
	LAOHAROJANAPHAND, Sirinart	THA	2008-07-21			2008-12-08	2008-12-12	4
	HOANG, Hoa Mai	VIE	2008-07-21		2008-10-28w			
	HOSSAIN, Dr. Sanwar	BGD	2008-07-21			2008-12-08	2008-12-12	4
	LE, Hai	VIE				2008-12-08	2008-12-12	4
	DAS, Kamalesh Kumar	BGD	2008-07-21			2008-12-08	2008-12-12	4
	DE OLIVEIRA SAMPA, Maria Helena	BRA				2008-12-08	2008-12-12	4

Fellowships

No	Name	Nominated	Awarded:a Non-awarded:n Withdrawn:w	Host Country	Type	Proposed:p Accepted:a Rejected:r	Anticipated Start Date	Start Date	End Date	Proposed Duration
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Scientific Visits

No	Name	Nominated	Awarded:a Non-awarded:n Withdrawn:w	Host Country	Type	Proposed:p Accepted:a Rejected:r	Anticipated Start Date	Start Date	End Date	Proposed Duration
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Training Courses**TC #001 IAEA/RCA Regional Training Course on the Promotion of Radiation Technology Utilization**

Objective: To inform the participants of the increasing role of radiation technology in health-care applications, production of value-added products from synthetic and natural polymers materials and to provide awareness on the technical, economic and social advantages of using radiation for its wider promotion.

Start Date: 2007-07-09 End Date: 2007-07-13

Course Type: Regional

Field: 8H Radiation Processing Facilities and Applications

APC Code: I2 Radiation Technology for Industrial Applications and a Safer Environment

Language: ENGLISH

Estimated participants: 20

Number of Participants: 25

No of selected candidates: 23

Number of lecturers: 2

Implementation Officer MAALOUF, Claudette

Course Director ABAD, Lucille Velez

Host Country Information

Host country	Host institute	Start Date	End Date
Philippines	Philippine Nuclear Research Institute (PNRI)	2007/07/09	2007/07/13

Lecturers

Name	Nationality	Sponsor	Start Date	End Date	Travel Free	Salary Free	Perdiem Free
GHAZALI, Zulkafli Bin	MAL		2007/07/09	2007/07/13			
HAN, Bum Soo	ROK		2007/07/09	2007/07/13			

Regular Participants

Nomination country	Name	Nationality	Sex	Sponsor	Start Date	End Date	Travel Free	Stipend Free
Bangladesh	HAQUE, Md. Emdadul	BGD	M		2007/07/09	2007/07/13		
China	JIAO, Zheng	CPR	M		2007/07/09	2007/07/13		
China	XU, Ling	CPR	F		2007/07/09	2007/07/13		
India	BISWAL, Jayashree	IND	F		2007/07/09	2007/07/13		
Indonesia	ABBAS, Basril	INS	M		2007/07/09	2007/07/13		
Indonesia	DARWIS, Darmawan	INS	M		2007/07/09	2007/07/13		
Malaysia	MANAF, Ishak	MAL	M		2007/07/09	2007/07/13		
Mongolia	BATBAYAR, Ooluun	MON	F		2007/07/09	2007/07/13		

Mongolia	NOROV, Enkhbat	MON	M	2007/07/09	2007/07/13
Myanmar	AUNG, Myat Soe	MYA	M	2007/07/09	2007/07/13
Myanmar	SOE NAN WAI	MYA	F	2007/07/09	2007/07/13
Pakistan	AHMAD, Mirza Jamil	PAK	M	2007/07/09	2007/07/13
Pakistan	HUSSAIN, Naveed	PAK	M	2007/07/09	2007/07/13
Sri Lanka	MOTHA, Srilal	SRL	M	2007/07/09	2007/07/13
Sri Lanka	SENEVIRATNE, Justin	SRL	M	2007/07/09	2007/07/13
Thailand	KEWSUWAN, Prartana	THA	F	2007/07/09	2007/07/13
Thailand	TANBOON, Nawabhorn	THA		2007/07/09	2007/07/13
Viet Nam	LE THI, Dinh	VIE	F	2007/07/09	2007/07/13
Viet Nam	NGUYEN DUY, Hang	VIE	M	2007/07/09	2007/07/13

Local Participants

Name	Nationality	Sex	Start Date	End Date
CERBOLLES, Justina	PHI	F	2007/07/09	2007/07/13
MEDINA, Victoria Fe	PHI	F	2007/07/09	2007/07/13
RAMIRO, Maria Celerina Medrano	PHI	F	2007/07/09	2007/07/13
SOLOMON, Haydee Marbas	PHI	F	2007/07/09	2007/07/13

TC #002 **IAEA/RCA Regional Training Course on Radiation Processing for Basic and Medium Level Personnel**

Objective: The purpose of the Training Course is to transfer knowledge regarding perspectives of radiation processing to support the activities undertaken by the participating Member States in developing and commercializing new products from radiation processed natural polymers as applied to health and environment.

Start Date: 2007-08-06 End Date: 2007-08-10

Course Type: Regional

Field: 8H Radiation Processing Facilities and Applications

APC Code: I2 Radiation Technology for Industrial Applications and a Safer Environment

Language: ENGLISH

Estimated participants: 17 Number of Participants: 24

No of selected candidates: 21 Number of lecturers: 2

Course Director: MOHD DAHLAN, Khairul Zaman Bin HJ

Host Country Information

Host country	Host institute	Start Date	End Date
Malaysia	Ministry of Science, Technology and Innovation; Malaysian Nuclear Agency	2007/08/06	2007/08/10

Lecturers

Name	Nationality	Sponsor	Start Date	End Date	Travel Free	Salary Free	Perdiem Free
ABAD, Lucille Velez	PHI		2007/08/06	2007/08/10			
MOHD DAHLAN, Khairul Zaman Bin HJ	MAL		Blank	Blank			

Regular Participants

Nomination country	Name	Nationality	Sex	Sponsor	Start Date	End Date	Travel Free	Stipend Free
Bangladesh	MOSHIUL ALAM, A. K. M.	BGD	M		2007/08/06	2007/08/10		
China	CHEN, Shimou	CPR	M		2007/08/06	2007/08/10		
India	CHAUDHARI, Chandrashekhar Vasudeo	IND	M		2007/08/06	2007/08/10		
India	SHAIK, Abdul Khader	IND	M		2007/08/06	2007/08/10		
Indonesia	HARDININGSIH, Lely	INS	F		2007/08/06	2007/08/10		
Indonesia	NURLIDAR, Farah	INS	F		2007/08/06	2007/08/10		
Mongolia	DAMDINSUREN, Bolortuya	MON	F		2007/08/06	2007/08/10		
Myanmar	HTUN, Zay Latt Htun	MYA	M		2007/08/06	2007/08/10		
Myanmar	THEIN THAN TOE	MYA	M		2007/08/06	2007/08/10		
Philippines	MESTIZO, Ma. Llorina Rañada	PHI	F		2007/08/06	2007/08/10		
Philippines	TABBADA, RHETT SIMON DELA CRUZ	PHI			2007/08/06	2007/08/10		
Sri Lanka	DE SILVA, Dinayadura Awanthi	SRL	F		2007/08/06	2007/08/10		
Sri Lanka	DE SILVA, Kumarawadu Ruwan Chandima	SRL	M		2007/08/06	2007/08/10		
Thailand	LAOBUTHEE, Apirat	THA	M		2007/08/06	2007/08/10		
Thailand	SRINUTTRAKUL, Wannee	THA	F		2007/08/06	2007/08/10		
Viet Nam	TRAN, Hong Thu	VIE	F		2007/08/06	2007/08/10		
Viet Nam	VO, Thi Kim Lang	VIE	F		2007/08/06	2007/08/10		

Local Participants

Name	Nationality	Sex	Start Date	End Date
APPADU, Sivanesan	MAL	M	2007/08/06	2007/08/10
RAJA HEDAR, Raja Jamal	MAL		2007/08/06	2007/08/10
TALIB, Marina	MAL	F	2007/08/06	2007/08/10
TALIP, Norhashidah	MAL	F	2007/08/06	2007/08/10

TC #003

Objective:	The purpose of the course is to introduce the participants to the general concepts of nanotechnology, radiation technology (gamma, electron beam and X-rays irradiators), their application in nanotechnology and review the present status of the art on radiation technology in this field		
Start Date:	2007-10-29	End Date:	2007-11-02
Course Type:	Regional		
Field:	8H Radiation Processing Facilities and Applications		
APC Code:	I2 Radiation Technology for Industrial Applications and a Safer Environment		
Language:	ENGLISH		
Estimated participants:	2	Number of Participants:	29
No of selected candidates:	22	Number of lecturers:	2
Implementation Officer	MAALOUF, Claudette	Course Director	MEHMOOD, Mazhar

Host Country Information

Host country	Host institute	Start Date	End Date
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PakistanPakistan Atomic Energy Commission -PAEC- Pakistan Institute of Engineering and Applied Sciences2007/10/292007/11/02

Lecturers

Name	Nationality	Sponsor	Start Date	End Date	Travel Free	Salary Free	Perdiem Free
BERTINO, Massimo	ITA		2007/10/29	2007/11/02			
ULANSKI, Piotr Krzysztof	POL		2007/10/29	2007/10/31			

Regular Participants

Nomination country	Name	Nationality	Sex	Sponsor	Start Date	End Date	Travel Free	Stipend Free
Bangladesh	DAFADER, Nirmal Chandra	BGD	M		2007/10/29	2007/11/02		
China	CHEN, Qingde	CPR	M		2007/10/29	2007/11/02		
China	XU, Gang	CPR	M		2007/10/29	2007/11/02		
Indonesia	SUDARYANTO	INS	M		2007/10/29	2007/11/02		
Indonesia	WARASTUTI, Yessy	INS	F		2007/10/29	2007/11/02		
Malaysia	APPADU, Sivanesan	MAL	M		2007/10/29	2007/11/02		
Malaysia	HARUN, Mohd Hamzah bin	MAL	M		2007/10/29	2007/11/02		
Mongolia	GALSAN, Sevjidsuren	MON	F		2007/10/29	2007/11/02		
Mongolia	KHISHIGBADRAKH, Balt-Erdene	MON	M		2007/10/29	2007/11/02		
Philippines	RELLEVE, Lorna	PHI	F		2007/10/29	2007/11/02		
Philippines	SAMSON, Vallerie Ann Innis	PHI	F		2007/10/29	2007/11/02		
Sri Lanka	LIYANAGE, Don Chaminda Nayanajith	SRL	M		2007/10/29	2007/11/02		
Sri Lanka	WICKRAMARACHCHI, Suranga	SRL	F		2007/10/29	2007/11/02		
Thailand	ANGKAEW, Suppalak	THA	M		2007/10/29	2007/11/02		
Thailand	KEWSUWAN, Prartana	THA	F		2007/10/29	2007/11/02		
Viet Nam	HOANG, Hoa Mai	VIE	M		2007/10/29	2007/11/02		
Viet Nam	LE, Hai	VIE	M		2007/10/29	2007/11/02		

Local Participants

Name	Nationality	Sex	Start Date	End Date
AFZAL, Asma	PAK	F	2007/10/29	2007/11/02
AHMAD, Mirza Jamil	PAK	M	2007/10/29	2007/11/02
HUSSAIN, Irshad	PAK	M	2007/10/29	2007/11/02
NADEEM, Muhammad	PAK	M	2007/10/29	2007/11/02
SAEED, Shaukat	PAK	M	2007/10/29	2007/11/02

Equipment

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

Sub-contracts

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

Training Courses

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

Others

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