



## **ALMERA**

*Analytical Laboratories for the Measurement of Environmental Radioactivity*

### **Minutes of the 4<sup>th</sup> coordination meeting**

*Abdus Salam International Centre for Theoretical Physics  
(ICTP, Trieste, Italy)  
5<sup>th</sup>-16<sup>th</sup> November 2007*

The 4<sup>th</sup> annual coordination meeting of the IAEA ALMERA (Analytical Laboratories for Measuring Environmental Radioactivity) network and the Workshop on “Understanding and Evaluating Radioanalytical Measurement Uncertainty”, took place at the Abdus Salam International Centre for Theoretical Physics (ICTP, Trieste, Italy) from 5<sup>th</sup> to 16<sup>th</sup> November 2007.

In recent years, the subject of the evaluation of measurement uncertainty in analytical laboratories has generated a significant level of interest and discussion. Although several guides have been published, analytical scientists frequently regard the estimation of uncertainty as too theoretical and not suitable for the estimation of uncertainties of complex chemical techniques. This is because identifying and quantifying all sources of uncertainty is difficult and laborious, for procedures consisting of numerous steps, many of which are not clearly distinguishable, whether they arise from the analytical techniques or the field sampling. The workshop held at the Abdus Salam International Centre for Theoretical Physics in Trieste represented a real possibility for scientists from analytical laboratories of the IAEA ALMERA network and from those belonging to laboratories of Members States, to work on practical exercises, and to refresh and up-date their knowledge and skills in uncertainty calculations. The achievement of reliable results requires the use of statistical techniques and the application of policies and procedures for the estimation, use and reporting of uncertainties of measurement for any nuclear analytical techniques. Sources of measurement uncertainty have to be identified, in addition to sampling uncertainty. Analytical laboratories must use reference materials and proper statistical tools in order to validate their analytical methods. The workshop aimed to provide delegates with an appreciation of the concept of uncertainty of measurement and sampling in environmental nuclear analysis. The workshop involved the participants in group exercises through the process of computation of uncertainties supported by a combination of lectures and interactive exercises and practical demonstrations and presentations.



*The Abdus Salam International Centre for Theoretical Physics, Trieste, Italy*

The 4<sup>th</sup> annual coordination meeting of the IAEA ALMERA network and the Workshop on “Understanding and Evaluating Radioanalytical Measurement Uncertainty” were attended by 62 participants as reported in following table.

Country	Name	Institution
IAEA	Kim Chang Kyu	International Atomic Energy Agency IAEA Agency's Laboratories Seibersdorf A-2444 Seibersdorf, Austria
	Kis-Benedek Gyula	International Atomic Energy Agency IAEA Agency's Laboratories Seibersdorf A-2444 Seibersdorf, Austria
	Martin Paul	International Atomic Energy Agency IAEA Agency's Laboratories Seibersdorf A-2444 Seibersdorf, Austria
	Pham Mai Khanh	International Atomic Energy Agency Marine Environment Laboratory 4 Quai Antoine 1 <sup>er</sup> 98012 Monaco Monaco Cedex, Monaco
	Sansone Umberto	International Atomic Energy Agency IAEA Agency's Laboratories Seibersdorf A-2444 Seibersdorf, Austria
	Shakhashiro Abdulghani	International Atomic Energy Agency IAEA Agency's Laboratories Seibersdorf A-2444 Seibersdorf, Austria
	Will Karin	International Atomic Energy Agency IAEA Agency's Laboratories Seibersdorf A-2444 Seibersdorf, Austria
ICTP	Sauleek Doreen	Abdus Salam International Centre for Theoretical Physics Strada Costiera 11 34014 Trieste, Italy
	Tuniz Claudio	Abdus Salam International Centre for Theoretical Physics Strada Costiera 11 34014 Trieste, Italy
Ethiopia	Kebede Worku Wodaje	Ethiopian Radiation Protection Authority ERPA P.O. Box 20486 Addis Ababa 1000, Ethiopia
France	Ratel Guy	Bureau International des Poids et Mesures BIPM Pavilion de Breteuil F-92312 Cedex Sevres, France
Greece	Karfopoulos Konstantinos	Nuclear Engineering Department School of Mechanical Engineering National Technical University of Athens 15780 Athens, Greece

Country	Name	Insitution
Hungary	Tarjan Sandor	Hungarian Agricultural Authority Food and Feed Safety Directorate Central Radioanalytical Laboratory P.O. Box 1740 H-1465 Budapest, Hungary
India	Shunmugavelu Chinnaesakki	Environmental Assessment Division Bhabha Atomic Research Centre Trombay Mumbai 400085, India
	Singhal Rakesh Kumar	Environmental Assessment Division Bhabha Atomic Research Centre Trombay Mumbai 400085, India
Indonesia	Iskandar Dadong	Center for Technology of Radiation Safety & Metrology National Nuclear Energy Agency Jl. Cinere Pasar Jumat P.O. Box 7043 JKSKL Jakarta Selatan, Jakarta 12070, Indonesia
Islamic Republic of Iran	Jafari Jamshid	Atomic Enery Organization of Iran Nuclear Waste Management Department P.O. Box 11365-8486 Northern Kargar Street Tehran, Islamic Republic of Iran
Italy	Giovani Concettina	Agenzia Regionale per la Protezione dell'Ambiente Dipartimento di Udine Sezione di Fisica Ambientale Via Colugna 42 Udine 33100, Italy
	Barbizzi Sabrina	APAT Agenzia per la Protezione dell'Ambiente e per i Servizi Tecnici Servizio Metrologia Ambientale Via Castel Romano 100 00128 Roma, Italy
	Belli Maria	APAT Agenzia per la Protezione dell'Ambiente e per i Servizi Tecnici Servizio Metrologia Ambientale Via Castel Romano 100 00128 Roma, Italy
	De Zorzi Paolo	APAT Agenzia per la Protezione dell'Ambiente e per i Servizi Tecnici Servizio Metrologia Ambientale Via Castel Romano 100 00128 Roma, Italy

Country	Name	Insitution
	Zeppa Paolo	APAT Agenzia per la Protezione dell'Ambiente e per i Servizi Tecnici Via Vitaliano Brancati 48 00144 Roma, italy
	Cozella Maria Letizia	ENEA Centro Ricerche Enea della Casaccia ENE Fori Unit Via Anguillarese 301 S. Maria di Galeria 00060 Roma, Italy
	Zicari Salvatore	ENEA Istituto di Radioprotezione Laboratorio Trisaia Strada Statale Ionica 106 km. 419,5 Rotondella (MT) I-75026 Matera, Italy
	De Felice Pierino	ENEA Istituto Nazionale di Metrologia delle Radiazioni Ionizzanti Centro Ricerche Casaccia Via Anguillarese, 301 - S.M. GaleriaI 00060 Roma C.P. 2400 00100 A.D. Roma ITALY
	Manes Daniela	Sogin SpA Radioprotection Unit Via Torino 6 00184 Roma, italy
Kuwait	Alzaqqah Muntaha Ali Saleh	Environmental Radiation Protection Division Radiation Protection Department Ministry of Health State of Kuwait Al-Awqaf Complex Tower 12, Flat 5 Safat, Kuwait
Latvia	Kisite Indra	Radiation Safety Centre 165 Maskavas Str LV 1019 Riga, Latvia
Malaysia	Norfaizal Bin Mohamed Muhammad	Radiochemistry and Environment Group Malaysian Nuclear Agency Bangi, Kajang 43000 Selangor, Malaysia
Moldova	Robu Elena	National Scientific Applied Center for Preventive Medicine Center for Radiation Protection and Radiation Hygiene Gh. Asachi str. no. 67 A Chisinau MD-2028, Moldova

Country	Name	Insitution
Nigeria	Ajayi Isaac Rotimi	Adekunle Ajasin University Department of Physics and Electronics P.M.B. 01 Ondo State Akungba Akoko, Nigeria
	Isinkaye Matthew Omoniyi	University of Ado Ekiti Department of Physics P.M.B. 5363 Ado Ekiti, Nigeria
	Busari Mutiu Abolante	University of Agriculture Dept. of Soil Science and Land Management P.M.B. 2240 Ogun State, Abeokuta 110001, Nigeria
Norway	Sidhu Rajdeep	Institute for Energy Technology Environmental Monitoring Section Health and Safety Department P.O. Box 40 N-2027 Kjeller, Norway
Pakistan	Jabbar Abdul	Health Physics Division Pakistan Institute of Nuclear Science and Technology PINSTECH P.O. Nilore, Islamabad, Pakistan
People's Republic of China	Li Junjie	Institute of Environmnet and Sustainable Development in Agriculture Chinese Academy of Agricultural Sciences CAAS No. 12 Zhongguancun South Street 100081 Beijing, People's Republic of China
Poland	Chmielewska Izabela	Central Mining Institute Pl. Gwarkow 1 40-166 Katowice, Poland
Portugal	Madruga Maria Jose	Nuclear and Technological Institute Department of Radiological Protection and Nuclear Safety E.N. 10, Apartado 21 2686-953 Sacavem, Portugal
Republic of Korea	Kim Yong Jae	Korea Institute of Nuclear Safety KINS 19 Guseong Yusong Daejeon, Republic of Korea
	Yun Ju Yong	Korea Institute of Nuclear Safety KINS 19 Guseong Yusong Daejeon, Republic of Korea A
Romania	Dulama Cristian Nicolae	Institute for Nuclear Research 1 Campului Str. 115400 Mioveni, Romania

Country	Name	Insitution
	Toma Alexandru	Institute for Nuclear Research 1 Campului Str. 115400 Mioveni, Romania
	Cristache Carmen Ileana	National Institute for Physics and Nuclear Engineering Horia Hulubei Radioactive Waste Management Department 407 Atomistilor Street P.O. Box MG-6 Bucharest 077125, Romania
	Margineanu Romul Mircea	National Institute for Physics and Nuclear Engineering Horia Hulubei Radioactive Waste Management Department 407 Atomistilor Street P.O. Box MG-6 Bucharest 077125, Romania
	Apostu Ana-Maria	National Institute of R & D for Physics and Nuclear Engineering Department of Life and Environmental Physics "Horia Hulubei", 407 Atomistilor Street, PO Box MG-6, jud. Ilfov RO-077125 Magurele, Romania
	Bucur Cristina	Nuclear Power Plant Environmental Laboratory Str. Medgidiei Nr. 1 Cernavoda 905200, Romania
	Popoaca Simona	Nuclear Power Plant Environmental Laboratory Str. Medgidiei Nr. 1 Cernavoda 905200, Romania
Slovenia	Kozar Logar Jasmina	Institute Jozef Stefan D. Environmental Sciences Jamova 39 1000 Ljubljana, Slovenia
Sweden	Norrlid Lilian	Swedish Radiation Protection Authority SSI Solna Strandvag 96 171 96 Stockholm, Sweden
Syrian Arab Republic	Hasan Mohammad	Atomic Energy Commission Dept. of Radiation Protection P.O.Box 6091 Damascus, Syrian Arab Republic
The Netherlands	Knetsch Gert-Jan	National Institute of Public Health and the Environment Antoine van Leeuwenhoehlaan 3721 MA Bilthoven, The Netherlands

Country	Name	Insitution
	Moet Frits Peter	Nuclear Research Group Measurements and Health Effect Section Product Group Radiation and Environment P.O. Box 25 Petten 1755 ZG, The Netherlands
United Kingdom	Harms Arend Victor	National Physical Laboratory Hampton Road Teddington TW11 0LW London, United Kingdom
United Republic of Tanzania	Mlwilo Nolasco Anton	Tanzania Atomic Energy Commission P.O.Box 743, Arusha, United Republic of Tanzania



*Practical demonstrations in the ICTP laboratories*

#### ***Main Recommendations from the 4<sup>th</sup> Annual Coordination Meeting of the ALMERA Network***

A regional meeting for the Asia-Pacific Region will take place at the Korea Institute of Nuclear Safety (KINS) from 10 to 13 December 2007. The aim of the Asia-Pacific ALMERA coordination meeting is to discuss the development of a rapid analysis method for Sr-90 in fresh milk. .

The fifth ALMERA coordination meeting will take place at the Brazilian National Commission for Nuclear Energy (CNEN), Instituto de Radioprotecao e Dosimetria, Rio De Janeiro, Brazil, from 27 to

29 October 2008. The IAEA should try to cover partially the attendance costs for some of the ALMERA laboratories.

The ALMERA participants recommended to organize in 2008 the following inter laboratory comparison exercise:

1. Gamma emitting radionuclides in soil, water and vegetation;
2. NORM in phosphogypsum;
3. Air filter with gamma emitting radionuclides

It was agreed that a feasibility study to identify a reference site for in-situ gamma spectrometry in the Asia-Pacific Region will be started by the Korea Institute of Nuclear Safety (KINS). The activities will be then addressed to the characterization of the selected site and in the organization of an intercomparison exercise. KINS requested the collaboration of the ALMERA members in phase of characterization. The Italian Environmental Protection Agency (APAT) will support KINS in the identification and characterization of the site.

The following reports and papers will be completed in 2008:

- 2007 Proficiency Test on Po-210 in water
- 2007 Proficiency Test on gamma emitting radionuclides
- Soil sampling exercise
- Review paper on Ra-226 determination in water
- Review paper on Pu by alpha spectrometry
- Recommended procedure on Pu rapid methods



*Participants to 2007 ALMERA network coordination meeting  
Abdus Salam International Centre for Theoretical Physics  
(ICTP, Trieste, Italy) - 5<sup>th</sup>-16<sup>th</sup> November 2007*