IAEA International Atomic Energy Agency

# ALMERA Newsletter

Prepared by the IAEA laboratories in Seibersdorf
Issue No. 1, October 2009
ISSN 2076-491X

### *In This Issue*



## Message from the Deputy Director General

From modest beginnings on its establishment in 1995, the ALMERA (**A**nalytical **L**aboratories for the **M**easurement of **E**nvironmental **Ra**dioactivity) network has expanded to include 118 laboratories, representing 73 of our Member States.

ALMERA initially started as a platform for data comparison and analysis in the field of environmental radioactivity, coordinated by the International Atomic Energy Agency laboratories in Seibersdorf (Austria). ALMERA network members are nominated by their countries for their ability to provide reliable and timely analysis of environmental samples in the event of an accidental or intentional release of radioactivity. Today, network activities include annual coordination meetings and proficiency tests, as well as sample collection intercomparison exercises, and development of standard analytical procedures for network members.

The network is a voluntary and cooperative effort to achieve global standards and cohesive guidelines in issues related to environmental radioactivity. Among some of the network's objectives are: achieving comparable analytical results traceable to the SI system, preparing guidelines for sampling and analysis methods for use by laboratories worldwide, and being a source of reliable and consistent information and advice for government bodies in their services to the public.

This newsletter reflects your demand for news and information on this important topic. We look forward to your continued participation in our activities.

Werner Burkart
Deputy Director General
Department of Nuclear Sciences and Applications

# Background material on the ALMERA network

## Origin of ALMERA network

The participants to the second research coordination meeting (RCM) of the IAEA Co-ordinated research project (CRP) on '*Rapid instrumental & separation methods for monitoring radionuclides in food and environmental samples*', held in Vienna (Austria) from 12 to 16 August 1991, expressed a strong desire to maintain the network of monitoring laboratories which had been assembled in response to the IAEA's request for assistance with the International Chernobyl Project [1]. The participants discussed how to maintain this network of laboratories that could be called upon to assess the extent of radioactive contamination in both the environment and food in case of a radiological emergency, and recommended that a new IAEA CRP be established:

- to maintain a network of analytical laboratories with special skills and experience to provide assessments of radionuclide contamination in the environment in case of a radiological emergency;
- to conduct intercomparison and testing of technologies, employing standard reference materials and procedures, and field measurements at significantly contaminated areas; and
- to conduct training of Member State laboratory personnel through fellowships, special courses and workshops.

Based on these recommendations, in 1994 a new IAEA CRP on '*Development and selection of analytical techniques and procedures for measuring accidentally released radionuclides in the environment'* was established. The objectives of this CRP were to conduct research and development on applicable methodologies for responding to accidental releases, and to improve and maintain the capabilities of the network of laboratories and provide training of individuals within Member States. Thus, the CRP served as a vehicle to maintain contact within the network of laboratories, while developing and transferring analytical techniques and procedures for measuring accidentally released radioactivity. The participants at the first RCM, held in Abu Dhabi (U.A.E.), from 4 to 7 December 1994, made the following recommendations regarding the network of laboratories [2]:

- a network of monitoring laboratories should be established with a core set of laboratories. The laboratories represented at this RCM could form the required core. The core could be subsequently be expanded to cover gaps in the capabilities of the network;
- the network of laboratories should be coordinated through the IAEA.

Based on these recommendations, the IAEA established in 1995 the ALMERA network (**A**nalytical **L**aboratories for the **M**easurement of **E**nvironmental **R**adio**a**ctivity) [3] [4] [5].

The network has suffered in the past from an organizational point of view, as only limited funds are available to allow the network programme to proceed and in the long-term sustain itself. The main difficulty has been to improve contacts between a group of laboratories dispersed world-wide, as is also reflected by the fact that only one coordination meeting could be organized in the first decade (Vienna in 1997). That meeting was attended mainly by European members as members from North and Latin America and from the Asia-Pacific region were not able to attend the meeting due to the lack of financial support.

The IAEA Secretariat was aware of these difficulties, and initiated actions to further the network's activities. This included organization of a second coordination meeting of the ALMERA network, held at the International Centre for Theoretical Physics (ICTP), Trieste (Italy) on 15 November 2005, and a soil sampling exercise also held in Italy in November 2005 [4]. At the 2nd coordination meeting, possible future directions for ALMERA were discussed by the participants and the IAEA Secretariat. One suggestion made during the meeting was that ALMERA be subdivided into a number of regional groups, to facilitate the interactions between the laboratories, so that in the case of an event of international significance they will be ready and able to work together. Further suggestions included the holding of annual meetings in different regional areas on a rotational basis, and that for each region a focal point institution should be identified to assist the IAEA in coordination activities. These suggestions were included in the report of the

meeting [4], which was sent to all ALMERA members for comment.

At the 2nd coordination meeting, the IAEA Secretariat was requested to develop a proposal for the new structure of the network, ready for presentation and discussion at the third ALMERA coordination meeting, to be held at the Korea Institute of Nuclear Safety (KINS) in Daejeon, Republic of Korea, in November 2006. The IAEA prepared a proposal for the new structure of the network, mainly based on the recommendations made by the ALMERA participants [4] and the draft proposal was sent for comment to the ALMERA members in September 2006.

The new structure of the ALMERA network was discussed and approved during the third ALMERA coordination meeting, held at KINS [5]. Comments made by those ALMERA participants that did not attend the meeting in the Republic of Korea were also taken into account in the preparation of the new structure.

## Functions of ALMERA

The objective of the ALMERA network is to maintain a world-wide group of laboratories capable of the following:

- achievement of comparability of analytical results which should be traceable to the SI system;
- applying and developing reliable radio analytical methods;
- preparing guidelines for sampling and methods of analysis for use by Member State laboratories;
- providing reliable and timely analysis of environmental samples in the event of an accidental or intentional release of radioactivity in the environment;
- providing assistance to neighbouring regions or other Member States in the event of an accidental or intentional release of radioactivity in the environment; and
- being a source of reliable and consistent information and advice for government bodies.

## Membership in ALMERA

The nomination of laboratories for membership in ALMERA has to be made by their governments and the IAEA has to be informed about the nominations through the Permanent Missions of the Member States to the Agency. There is no deadline for such a nomination.

ALMERA currently (May 2009) consists of 118 laboratories representing 73 countries. The Agency's Seibersdorf laboratories in Austria and its marine environment laboratories in Monaco are additional members of the network. A full listing of the current ALMERA member laboratories is given in the back of this Newsletter.

## Central coordination of ALMERA

The Chemistry Unit of the Physics, Chemistry and Instrumentation (PCI) Laboratory at the Agency's Seibersdorf Laboratory in Austria is the central coordinator of the ALMERA network's activities.

The role of the PCI-Chemistry Unit, as central coordinator, is:

- to coordinate the global network and develop medium and long-term targets to help the network laboratories to improve their readiness in case of need;
- to evaluate the analytical performance of the ALMERA laboratories by organization of interlaboratory comparison exercises and support the laboratories to enhance the quality of their analytical measurement in radionuclide determination;
- to assure that the results produced by the laboratories are traceable to SI whenever possible thus enabling their comparability;
- to disseminate information of interest to ALMERA members, such as reports of meetings, guidelines for sampling design, sample collection and treatment, analytical methods, etc.;
- to convene and chair the annual ALMERA coordination meeting;
- to report the outcomes and recommendations of the annual coordination meetings.

## ALMERA regional groups

To facilitate interactions between the ALMERA laboratories, the network is subdivided into the following regional groups:

- Africa;
- Europe
- Middle East;
- Asia-Pacific;
- North and Latin America.

The groups were defined by the IAEA according to the geographical distribution of participating laboratories. Each ALMERA laboratory is requested to indicate the

group to which it wants to belong. In the case of no indication being given, the IAEA will assign the ALMERA laboratory to a regional group on the basis of its geographical location. If at any time a laboratory wishes to change to a different regional group for any reason it is allowed to do so. In the case of a country having two or more laboratories in ALMERA, it is possible for the different laboratories to belong to different regional groups.

It should be emphasized that assignment to one regional group does not preclude a laboratory from taking part in ALMERA activities of another regional group. Nevertheless, in order to simplify organization, each laboratory should formally belong to only one regional group.

Each regional group is coordinated by an ALMERA regional coordinating centre. The coordinating centres should generally rotate every five years between members of the same regional group.

The current coordinating centres are the IAEA Laboratories Seibersdorf (Austria) for the Africa-Europe-Middle East regions, the Korea Institute of Nuclear Safety (KINS, Republic of Korea) for the Asia-Pacific region and, the Instituto de Radioprotecao e Dosimetria (IRD, Brazil) for the North and Latin America region.

## ALMERA annual coordination meetings

The annual coordination meeting with the ALMERA members should take place on rotation between the different regional groups. The objectives of the meetings are to improve communications, to evaluate the status of the laboratories, to improve their technical competence through standardization of sampling, monitoring and measurement protocols and through staff training.

To increase interaction between the laboratories, the IAEA should partially cover the expenses for the participation at the meeting of some of the laboratories belonging to the same regional group.

The minutes, outcomes and recommendations of the coordination meetings will be published in future issues of this newsletter.

## Analytical performance of the ALMERA members

Interlaboratory comparison exercises which are specifically organized for ALMERA on a regular basis by the Chemistry Unit of the PCI Laboratory at Seibersdorf [3],[6]. These exercises are designed to monitor and demonstrate the performance and analytical capabilities of the network members, and to identify gaps and problem areas where further development is needed. Continued membership has benefits in training and educational opportunities, enhanced mutual trust in results and methodology and objective evidence for accreditation purposes.

In recent years, at least one interlaboratory comparison exercise should be organised per year by the IAEA for the ALMERA network. In case of any special event it may be extended to additional exercises. The following matrices have been identified by ALMERA members as of primarily interest due to their importance both for routine monitoring and issues where the measurement results should be ready in a short time: soil, water, vegetation and air filters.

The performance evaluation results of the interlaboratory comparison exercises performed in the frame of the ALMERA network are not anonymous for those laboratories nominating to participate as ALMERA members.

Considering that the ALMERA network members may need to support radionuclide measurement in issues where the measurement results should be ready in a short time, the ALMERA interlaboratory comparison exercises generally include two reporting time frames: a rapid or short-term timeframe (usually 1 week or less) and a longer-term timeframe (usually 3 months). The approach for evaluation of the results for the short-term and longer-term reporting time may be carried out on a different basis. This is because it cannot be expected that the same trueness and precision would be reached for a rapid analysis as for a longer-term analysis.

A certificate of participation in the ALMERA interlaboratory comparison exercises is issued by the IAEA to the participating laboratory. The participation in and the results of the ALMERA interlaboratory comparison exercises are be published by the IAEA.

***References***

[1] Report of the second Research Coordination Meeting on the Coordinated Research Programme ‘Rapid instrumental and separation methods for monitoring radionuclides in food and environmental samples’, IAEA/AL/056, p. 38, August 2001.

[2] Report of the first Research Coordination Meeting on the Coordinated Research Programme ‘Development and selection of analytical techniques for measuring accidentally released radionuclides in

environment', IAEA/AL/082, p. 30, December 1994.

[3] A. Shakhashiro, Z. Radecki, A. Trinkl, U. Sansone and T. Benesch, 'Final Report on the Proficiency Test of the Analytical Laboratories for the Measurement of Environmental Radioactivity (ALMERA) Network', IAEA/AL/152, p.242, August 2005.

[4] Report on the Second ALMERA coordination meeting and the ALMERA soil sampling intercomparison exercise – IAEA/SIE/01, IAEA/AL/164, p.36, May 2006.

[5] Report on the ALMERA Meeting 2006 at the Korea Institute of Nuclear Safety (KINS), Daejon, Republic of Korea – IAEA/AL/177, p26, March 2007.

[6] Report on the IAEA-CU-2006-04 ALMERA Proficiency Test on the Determination of Gamma Emitting Radionuclides – IAEA/AL/170, May 2007.

# ALMERA regional and coordination meetings

## Vienna, Austria 1997: 1st ALMERA Coordination Meeting

The first ALMERA network coordination meeting took place in Vienna (Austria) on 17 November 1997 and was hosted by the International Centre for Theoretical Physics (ICTP).

38 participants from 15 countries attended the meeting. One of the purposes of the meeting was to provide the participants with an opportunity to review and discuss the results of the first intercomparison exercises carried out in 1995-1996. The second purpose of the meeting was to have the participants discuss and decide the future role and functions of the network.

## Trieste, Italy 2005: 2nd ALMERA Coordination Meeting

The second ALMERA network coordination meeting took place in Trieste (Italy) on 15 November 2005 and was hosted by the International Centre for Theoretical Physics (ICTP).

The overall aim of the meeting was to evaluate the current status of the ALMERA network laboratories and to help to improve their technical competence through harmonization of sampling, monitoring and measurement protocols and staff training. The meeting was also addressed to defining the structure of the ALMERA network and future proficiency tests and intercomparison trials to be organized by the IAEA to help the laboratories to maintain and improve the quality of their analytical measurements. 45 participants from 29 different institutions attended the meeting.

At the 2nd coordination meeting, the IAEA Secretariat was requested to develop a proposal for the new structure of the network, ready for presentation and discussion at the third ALMERA coordination meeting, to be held at the Korea Institute of Nuclear Safety (KINS) in Daejeon, Republic of Korea, in November 2006.

The meeting was chaired by Mr. Umberto Sansone, Head of the IAEA Chemistry Unit of the Physics, Chemistry and Instrumentation Laboratory in Seibersdorf (Austria) and by Mr. Claudio Tuniz, Special Adviser to the Director of the Abdus Salam International Centre for Theoretical Physics.

## Daejeon, Republic of Korea 2007: 3rd ALMERA Coordination Meeting

The third ALMERA network coordination meeting took place in Daejeon (Republic of Korea) from 13th to 16th November 2006 and was hosted by the Korea Institute of Nuclear Safety (KINS).

The meeting was chaired by Mr. Umberto Sansone, Head of the IAEA Chemistry Unit of the Physics, Chemistry and Instrumentation Laboratory in Seibersdorf (Austria) and by Mr. Claudio Tuniz, Special Adviser to the Director of the Abdus Salam International Centre for Theoretical Physics. The meeting was attended by 36 participants from 77 different countries.

The overall aim of the meeting was to evaluate the current status of the ALMERA network laboratories and to defining the structure of the ALMERA network. 45 participants from 29 different institutions attended the meeting.

During the meeting it was also agreed that for the period 2007-2009, the coordinating centres for the Africa-Europe-Middle East regions will be the IAEA central ALMERA coordinator, i.e. the Chemistry Unit of the IAEA Physics, Chemistry and Instrumentation

Laboratory (PCI) and the coordinating centre for the Asia-Pacific region will be the Korea Institute of Nuclear Safety (KINS).


*Participants to the third ALMERA coordination meeting Korea Institute of Nuclear Safety (KINS, Daejeon, Republic of Korea), 13-16 November 2006.*

## Trieste, Italy 2007: 4th ALMERA Coordination Meeting

The 4th ALMERA network coordination meeting and the Workshop on 'Understanding and Evaluating Radioanalytical Measurement Uncertainty' took place in Trieste, Italy, at the Abdus Salam International Centre for Theoretical Physics (ICTP), from 5th to 16th November 2007.

The Workshop on 'Understanding and Evaluating Radioanalytical Measurement Uncertainty' represented a possibility for scientists from ALMERA analytical laboratories to work on practical exercises, and to refresh and up-date their knowledge and skills in uncertainty calculations. The workshop involved the participants in group exercises through the process of evaluation of radioanalytical results including the assessment of uncertainty budget, supported by a combination of lectures, interactive exercises on selected study cases, and practical demonstrations in the ICTP laboratories.

*The Abdus Salam International Centre for Theoretical Physics (ICTP).*

*Practical demonstrations at the ICTP laboratories.*

The 4th ALMERA network coordination meeting and the Workshop on 'Understanding and Evaluating Radioanalytical Measurement Uncertainty' was attended by 61 participants from 34 different countries.

## Daejeon, Republic of Korea 2007: Asia-Pacific Regional Meeting

The 2007 Asia-Pacific regional ALMERA network coordination meeting took place in Daejeon (the Republic of Korea) from 10th to 12th December 2007 and was hosted by the Korea Institute of Nuclear Safety (KINS).

The meeting was officially opened by Mr. Won Ky Shin, President of the Korea Institute of Nuclear Safety and was chaired by Mr. Paul Martin, Head of the Physics, Chemistry and Instrumentation Laboratory, Agency's laboratories, Seibersdorf (Austria) and by Mr. Sung Ho Na, Executive Director, the Korea Institute of Nuclear Safety. The meeting was attended by 20 participants from 7 different institutions.

The main aim of the meeting was to discuss and define the work plan for the development of rapid analysis method of Sr-90 in fresh milk.



*Participants to 2007 Asia-Pacific regional ALMERA network coordination meeting*
*Korea Institute of Nuclear Safety (KINS). Daejeon, Republic of Korea, 10-12 December 2007.*

# Minutes of the 5th ALMERA coordination meeting

The fifth ALMERA (Analytical Laboratories for the Measurement of Environmental Radioactivity) network coordination meeting took place in Rio de Janeiro, Brazil, from 27 to 29 October 2008 and was hosted by the Comissao Nacional de Energia Nuclear, Instituto de Radioprotecao e Dosimetria (CNEN-IRD).

The meeting was officially opened by Mr. Luiz Fernando Carvalho Conti, the Director of CNEN-IRD and by Mr. Umberto Sansone, Head of the the IAEA Chemistry Unit of the Physics, Chemistry and Instrumentation Laboratory in Seibersdorf (Austria). The meeting was chaired by Ms. Ana Cristina de Melo Ferreira, Head of the Service of Environmental Analysis (SEANA – Servico de Analisis Ambientais) of CNEN-IRD.

The meeting was attended by 27 participants from 17 countries, representing 21 different institutions. Representatives of the Korea Institute of Nuclear Safety (KINS), as coordinating centre of the ALMERA Asia-Pacific regional group, attended the meeting.

| | | |
|---|---|---|
| IAEA | Chang Kyu Kim | Seibersdorf Laboratories, Austria |
| | Umberto Sansone | Seibersdorf Laboratories, Austria |
| Brazil | Luiz Fernando Carvalho Conti | CNEN-IRD, Rio de Janeiro |
| | Ana Cristina de Melo Ferreira | CNEN-IRD, Rio de Janeiro |
| | Almir Clain | CNEN-IRD, Rio de Janeiro |
| | Maria Elizabeth C. M. Vianna | CNEN-IRD, Rio de Janeiro |
| | Maura Bragança | CNEN-IRD, Rio de Janeiro |
| | Maria Helena Tirollo Taddei | CNEN-Poços de Caldas |
| | Barbara Mazzilli | CNEN-IPEN, Sao Paulo |
| Republic of Korea | Ji Yon Lee | Korea Institute of Nuclear Safety |
| | Yongjae Kim | Korea Institute of Nuclear Safety |
| | Ju Yong Yun | Korea Institute of Nuclear Safety |
| Germany | Seigurd Mobius | FTU/FZK Research Center Karlsruhe |
| Hungary | Tarjan Sandor | Food and Feed Safety Directorate, Budapest |
| Spain | Fernando Legarda | University of the Basque Country, Bilbao |
| Slovenia | Jasmina Kozar-Logar | Josef Stefan Institute, Ljubljana |
| Poland | Izabela Chmielewska | Central Mining Institute, Katowice |
| Cuba | Isis Maria Fernàndez Gòmez | Center for Radiation Protection and Hygiene, Havana |
| Sweden | Lilian del Risco Norrlid | Swedish Radiation Safety Authority |
| Costa Rica | Luis Guillermo Loria | Universidada de Costa Rica |

| | | |
|---|---|---|
| Uruguay | Maria del Rosario Odino Moure | Direccion Nacional de Enrergia y Tecnologia Nuclear, Montevideo |
| Chile | Osvaldo Hernan Pinones Olmos | Chilean Commission of Nuclear Energy |
| Czech Republic | Petr Rulik | National Radiation Protection Institute (SÚRO) |
| Peru | Jose Osores Rebaza | Instituto Peruano de Energia Nuclear, Lima |
| Romania | Cristina Bucur | Nuclear Power Plant Cernavoda |
| Argentina | Flora Amanda Iglicki | Comision Nacional de Energia Atomica, Buenos Aires |
| Mexico | Ligia Ruiz | Comision Nacional de Seguridad Nuclear y Salvaguardias, Mexico City |

## Objectives of the meeting

The overall aim of the meeting was:

- to evaluate the current status of the ALMERA network;
- to discuss the implementation of the current activities of the ALMERA network;
- to define the future activities of the ALMERA network.

## Current status of the ALMERA network

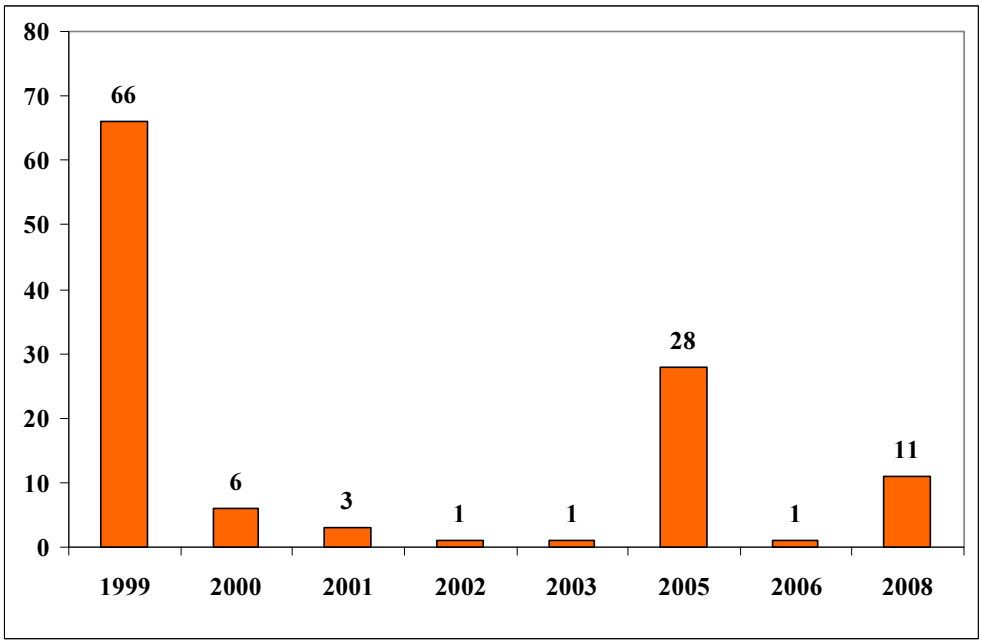
ALMERA currently consists of 117 laboratories representing 72 countries. The Agency's Seibersdorf Laboratory in Austria and its Marine Environment Laboratory in Monaco are additional members of the network.

In 2008 the following eleven laboratories joined the ALMERA network:

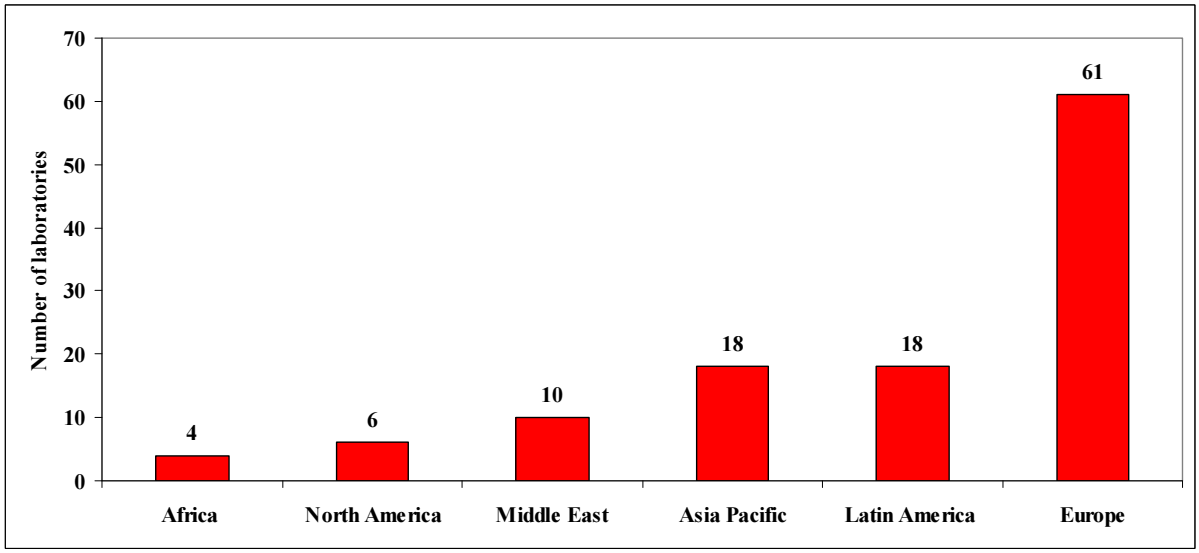
- Comision Nacional de Energia Atomica (Argentina);
- Brazilian National Commission for Nuclear Energy (CNEN-IPEN) (Brazil);
- National Radiation Protection Institute (Czech Republic);
- ARPA-Lombardia (Italy);
- Japan Chemical Analysis Center (Japan);
- Instituto Peruano de Energia Nuclear (Peru);
- Laboratory of Radiometry of the Central Mining Institute (Poland);
- Universidad del Pais Vasco (Spain);
- Dirección Nacional de Energia y Tecnologia Nuclear (Uruguay);
- Ministerio del Poder Popular para la Energia y Petróleo (Venezuela);
- Centro de Estudios Ambientales de Cienfuegos (Cuba).

During the 5th ALMERA coordination meeting, the representatives of the countries which joined the network in 2008 presented papers about their institutions and work.

The following figure shows the nominations of ALMERA laboratories in the different years from 1999 to 2008.



The following figure shows the current distribution of ALMERA laboratories by region.




From 2005 the annual coordination meetings with the ALMERA members took place each year on rotation between the different regional groups as reported in the following table.

| | | | | |
|---|---|---|---|---|
| 1999 | : | 1st coordination meeting | IAEA, Vienna (Austria) | 38 participants (15 countries) |
| 2005 | : | 2nd coordination meeting | ICTP, Trieste (Italy) | 45 participants (29 countries) |
| 2006 | : | 3rd coordination meeting | KINS, Daejeon (Republic of Korea) | 36 participants (17 countries) |
| 2007 | : | 4th coordination meeting | ICTP, Trieste (Italy) | 63 participants (35 countries) |
| 2008 | : | 5th coordination meeting | CNEN-IRD, Rio de Janeiro (Brazil) | 27 participants (17 countries) |

In addition, in 2007 an Asia-Pacific regional meeting was held at KINS, Daejeon (Republic of Korea) with 20 participants from 5 countries.

The meetings permitted improved communications between network members, assessment of the status of the laboratories and improvement in the collaborations between members of the same regional group. To increase interaction between the laboratories, the IAEA has partially covered the expenses for the participation at the meeting of some of the laboratories belonging to the same regional group.

## Current activities of the ALMERA network

The results of 2006 and 2007 proficiency tests specifically organized by the IAEA for ALMERA members were discussed during the meeting (IAEA-CU-2006-04 on the determination of gamma emitters in soil, water, grass samples (IAEA/AL/170), IAEA-CU-2007-04 on the determination of gamma emitters in soil, water and spinach samples) and IAEA-CU-2007-09 ALMERA and world wide open proficiency test on the determination of Po-210 in water. Considering that a large number of participants from Latin America joined the ALMERA network in the period 2007-2008, the participants suggested that it will be extremely useful to organize training courses for the Latin American participants to work on practical exercises, and to refresh and up-date knowledge and skills in radioanalytical techniques. It was suggested that the first course should be on gamma spectrometry. It was recommended that all the ALMERA Latin America participate in the proficiency tests that will be organized in 2009 for the ALMERA members.

The ALMERA members suggested that the 'Not acceptable' results obtained by the members in the ALMERA proficiency tests should be discussed in one session of each annual coordination meeting in order to identify gaps and areas where further development is needed.

During the discussion it was pointed out that at the moment another radioanalytical network is currently in force in the Latin America region, the RILARA network (Ibero-American Laboratories Network of Radioactivity Analysis in Food). RILARA is a thematic

network that was established during 2007 with the financial support of the Ibero-American Program of Science and Technology for Development (CYTED). The network, coordinated by CIEMAT, Spain, brings together laboratories from Argentina, Brazil, Cuba, Ecuador, Spain, Mexico, Peru and Venezuela. The main objective of thematic networks is the transfer of knowledge among the research groups and to foster cooperation as a working method. Their mission is to create a collaboration framework that allows in the future developing new common actions.

Considering that ALMERA and RILARA networks have some links, the participants of the 5th ALMERA coordination meeting suggested that it would be useful to harmonize the analytical techniques used by both networks. Considering that CIEMAT (Spain) is the coordinator of RILARA, the participants to the 5th coordination meeting suggested IAEA contact CIEMAT and verify the possibility to jointly organize the 2009 training course on gamma spectrometry.

Concerning the development of recommended procedures, the Korea Institute of Nuclear Safety (KINS), as focal point of the ALMERA Asia-Pacific regional group, presented the implementation of the activities performed in the period 2007-2008. The development of rapid analysis method for $^{90}$Sr in milk was the main outcome achieved by the group. Milk is one of most important pathways for the ingestion dose of $^{90}$Sr and a rapid analytical method for $^{90}$Sr, to be used in case of radiological emergency situation, will be extremely useful for the ALMERA network. KINS is also currently a member of the IAEA multi-institutional Advisory Group on the production and characterization of reference materials of terrestrial origin.

In the framework of development of recommended procedures the participants in the 2008 ALMERA coordination meeting suggested that the IAEA should provide to the active ALMERA members, the IAEA reference materials free of charge and within limited amount, where they are used for method validations and method development in the frame of ALMERA.

## Future activities of the ALMERA network

The IAEA presented a draft proposal for the determination of $^{226}$Ra in drinking water using gamma-spectrometry, alpha-spectrometry, liquid scintillation counting and ICP-MS. On the basis of a literature review, the IAEA will select one or two candidate recommended procedures for the determination of $^{226}$Ra in drinking water using gamma-spectrometry, alpha-spectrometry and liquid scintillation counting. The ALMERA member laboratories, interested to participate in the validation of the methods in terms of trueness, repeatability and reproducibility will be contacted and involved in the activities. This activity will be implemented on voluntary basis.

As mentioned above, the ALMERA Asia-Pacific regional group, coordinated by the Korea Institute of Nuclear Safety (KINS), is developing a rapid analysis method for $^{90}$Sr in milk to be used in case of radiological emergency situation. The method will be validated in 2009 through an interlaboratory comparison study using spiked milk powder. The IAEA intercomparison study will be organized in cooperation between the IAEA, the KINS and the Hungarian Food and Feed Safety Directorate.

As was recommended during the 4th ALMERA coordination in Trieste, Italy, also the participants to the 5th coordination meeting pointed out the need to organize a proficiency test on gamma emitting radionuclides in air filters. It was suggested to organise this proficiency test in 2009 in collaboration with ENEA, Italy, that has a long experience in this field.

The Abdus Salam International Centre for Theoretical Physics (ICTP) in Trieste, Italy, together with the IAEA will organize a training course on *in-situ* X-ray Fluorescence and Gamma Ray Spectrometry from 26 to 30 October 2009.

The 6th ALMERA coordination meeting will be organized in the 4th quarter 2009 in Europe. The date and location are not at the moment defined.

A regional meeting for the Asia-Pacific region took place in the Republic of Korea in April 2009 combined with a seminar on uptake of radionuclides into staple crops in the Asian region.

As an additional information, the IAEA announced that IAEA/WMO jointly organized the technical meeting on 'Sources and measurements of radon and radon progeny applied to climate and air quality studies', 22-24 June 2009 IAEA Headquarters, Vienna, Austria, co-sponsored by World Meteorological Organization (WMO).

## Recommendations

The participants of the 5th ALMERA coordination meeting recommended that the focal points of each ALMERA regional focal point should rotate every five years between members of the same regional group. On this basis the participants agreed that the focal point for the Asia-Pacific region should be extended until the end of 2011.

The ALMERA participants agreed to nominate the Institute of Radiation Protection Dosimetry of the Brazilian National Commission of Nuclear Energy (CNEN-IRD), as coordinating centre for the North and Latin America region, for the period 2009-2013.

The ALMERA participants requested the IAEA to issue an official certificate mentioning the designation of the laboratory as ALMERA member and as coordinating centre of the ALMERA network.

Each ALMERA meeting should be combined with a workshop and/or training course related to environmental radioactivity measurement techniques.

The ALMERA participants recommended that the Korea Institute of Nuclear Safety (KINS), as ALMERA coordinating centre for the Asia-Pacific region, should continue to organize annually the regional meetings, to facilitate the interactions between the ALMERA laboratories of the same area. On this basis, the KINS proposed to organize the meeting in April 2009 in the Republic of Korea. The meeting will be combined with a seminar on uptake of radionuclides into staple crops in the Asian region.

The ALMERA participants highly recommended organizing training courses for the Latin American participants to work on practical exercises, and to refresh and up-date knowledge and skills in radioanalytical techniques. The first course should be on gamma spectrometry and possibly organized in 2009 jointly in collaboration with the RILARA network (Ibero-American Laboratories Network of Radioactivity Analysis in Food), coordinated by CIEMAT, Spain.

The ALMERA participants suggested that the IAEA should provide to the active ALMERA members, the IAEA reference materials free of charge and within limited amount, where they are used for method validations and method development in the frame of ALMERA.

Considering that a large number of participants from Latin America joined the ALMERA network in the period 2007-2008, the ALMERA participants highly recommended that all the ALMERA Latin America members participate in the proficiency tests that will be organized in 2009 for the ALMERA members.

The ALMERA participants requested that during each ALMERA meeting one session should be devoted to discuss the 'Not acceptable' results obtained by the members in the ALMERA proficiency tests, in order to identify gaps and areas where further development are needed.

*Participants to the fifth ALMERA coordination meeting*
*Comissao Nacional de Energia Nuclear, Instituto de Radioprotecao e Dosimetria (CNEN-IRD)*
*Rio de Janeiro (Brazil), 27-29 October 2008.*

# ALMERA interlaboratory comparison exercises

## ALMERA Soil Sampling Inter-comparison Exercise (IAEA/SIE/01)

The soil sampling intercomparison exercise took place from 14 to 18 November 2005 in an agricultural area qualified as a 'reference site' in the frame of the SOILSAMP international project, funded and coordinated by the Italian Environmental Protection Agency (ISPRA) and aimed at assessing the uncertainty associated with soil sampling in agricultural, semi-natural, urban and contaminated environments. The 'reference site' is located in the North Eastern part of Italy (Pozzuolo del Friuli, Udine), in the research centre belonging to the Agenzia Regionale per lo Sviluppo Rurale del Friuli Venezia Giulia (ERSA). The 'reference site' is characterised in terms of spatial/temporal variability of trace elements. The trace elements present at the reference site are of natural and anthropogenic origins.

Soil is the final receptor of trace elements, including radionuclides and organic pollutants dispersed in the environment. In the long term after deposition, the behaviour of long-lived radionuclides in soil can be expected to be similar to that of some stable trace elements and the distribution of these trace elements in soil can simulate the distribution of radionuclides. In addition, soil sampling procedures for radionuclides derive from techniques used in agriculture and engineering. For all these reasons, the 'reference site' characterized in term of trace elements can be used to compare the soil sampling strategies developed for radionuclide investigations by the ALMERA laboratories.

Due to the limited extent of the reference sampling area and considering that collaborative field studies require considerable organisational efforts, for the current year exercise only 10 ALMERA Institutions were selected to participate in the sampling exercise. Experts from IAEA, ISPRA and ERSA provided the assistance during the sampling exercise.

*Participants to the ALMERA Soil Sampling Intercomparison Exercise*
*Agenzia Regionale per lo Sviluppo Rurale del Friuli Venezia Giulia (ERSA)*
*Pozzuolo del Friuli, Udine (Italy), 14-18 November 2005.*

# Other news

## International Cooperation: Specialists Meeting of two CCQM Working Groups hosted by the IAEA

Cooperation with relevant organizations and bodies is one of very important factors enabling the IAEA to deliver up to date services and products to its Member States. In the area of metrology, the IAEA cooperation with the International Bureau of Weights and Measures (BIPM) has a very long tradition. The IAEA is also a signatory of the Mutual Recognition Arrangement (MRA), which has been drawn up by the International Committee of Weights and Measures (CIPM) in 1999 under the authority given to it in the Metre Convention. The objectives of this MRA are to establish degree of equivalence of national measurement standards maintained by the National Metrology Institutes (NMIs), to provide for the mutual recognition of calibration and measurement certificates issued by NMIs and to provide governments and other parties with a secure technical foundation for wider arrangements related to international trade, commerce and regulatory affairs. The IAEA is the keeper of the international measurement standards, namely VSMOW 2 (Vienna Standard Mean Ocean Water 2) and SLAP 2 (Standard Light Antarctic Precipitation 2), which provide the basis for stable isotope ratio measurements of oxygen and hydrogen. On the other hand, the term measurement standard encompasses reference materials as well. Over more than 40 years, the IAEA has been the major producer of matrix reference materials of

terrestrial and marine environment origin characterized for radionuclides. On the list of the IAEA reference materials produced so far there are also numerous reference materials characterized for trace and major elements, chemical compounds and organic pollutants. In strengthening its metrological position in the area of reference materials the IAEA has in the last years intensified its cooperation with the BIPM and NMIs.


*Opening remarks of DDG-NA Mr. Werner Burkart at the meeting of the Inorganic (IAWG) and Electrochemical (ECWG) Working Group of the Consultative Committee for Amount of Substance — Metrology in Chemistry – IAEA, Vienna (Austria) 8 October 2008.*

In this line the IAEA has hosted a meeting of the Inorganic (IAWG) and Electrochemical (ECWG) Working Group of the Consultative Committee for Amount of Substance — Metrology in Chemistry. The meeting took place on 8 and 10 October 2008 at the IAEA Headquarters in Vienna. As an integral part a one day workshop on *Technical Challenges Related to the Production of Standards and Matrix CRMs* was held at the Agency's Laboratories in Seibersdorf on 9 October.


*Participants to the meeting of the Inorganic (IAWG) and Electrochemical (ECWG) Working Group of the Consultative Committee for Amount of Substance — Metrology in Chemistry Vienna and Seibersdorf (Austria) 8-10 October 2008.*

More than 50 participants from 23 NMIs and the IAEA discussed the current and future work of both working groups. The major activity of CCQM and its WGs is organization of pilot studies and key-comparisons, which represent the practical underpinning of MRA. The IAEA is actively involved in these comparisons as participant and as a coordinator. Experience gained at this top metrological level is well used by the IAEA in organization and evaluation of intercomparison studies, including those organized in the frame of ALMERA.

## Development of a recommended procedure for determination of Po-210 in water

The results of a proficiency test organized by the IAEA in 2007 demonstrated that a number of laboratories are experiencing difficulties in obtaining reliable results for $^{210}$Po determination in water samples. This is most likely due in part to the limited number of methods available for its determination, the most commonly used being alpha-particle spectrometry.

As a part of its activities to support its Member State laboratories, the IAEA is developing recommended procedures for determination of selected radionuclides in environmental samples. In the case of $^{210}$Po, this started with the collection and review of about 130 papers from the scientific literature. Based on this review, two candidate methods for determination of $^{210}$Po in water samples were selected for testing, refinement and validation. The two Po separation procedures are based on DDTC solvent extraction (DDTC-SE) and extraction chromatography using Sr-resin (Sr-EC). Reports in the literature indicate that both methods have been successfully used for determination of $^{210}$Po in a variety of sample matrices. The method validation of both methods was carried out in terms of trueness, repeatability and reproducibility with tap water spiked with a known amount of $^{210}$Po.

The final report on the method is currently in preparation and further details will be reported in the next ALMERA Newsletter.

## Proceedings of the 2007 IAEA conference on Environmental Radioactivity

Understanding the behaviour of radioactive materials in the environment and regulating environmental practices involving radioactive materials are multi-facetted activities. They involve specialists from a wide range of disciplines, including those involved in taking samples and making measurements; those interpreting data; those making operational decisions based on such data; and those drafting and supervising the application of regulatory legislation, standards, guides and procedures.

In order to foster information exchange between professionals working in these disciplines, the IAEA organized an international conference on *Environmental Radioactivity: From Measurements and Assessments to Regulation*, from 23-27 April 2007 in Vienna, Austria. The conference provided a forum at which current methodologies, trends and developments and practical compliance issues were reviewed and discussed. It was attended by 256 participants from 56 countries.

The conference was organized jointly by the IAEA's Department of Nuclear Sciences and Applications, and the Department of Nuclear Safety and Security. Several organizations cooperated with the IAEA in organizing the conference; these were the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), the South Pacific Environmental Radioactivity Association (SPERA), and two IAEA Collaborating Centres, the National Food Investigation Institute of Hungary (NFII) and the Belgian Nuclear Research Centre (SCK•CEN).

The papers submitted by authors of oral presentations at the conference and accepted for publication following peer review have been published in Volume 66, Issue 11 of November 2008 of the Journal *Applied Radiation and Isotopes*. An additional IAEA publication is expected to be published soon as a CD-ROM containing other papers and material from the conference.

## Abdus Salam International Centre for Theoretical Physics (ICTP) course

The Abdus Salam International Centre for Theoretical Physics (ICTP) in Trieste, Italy, together with the IAEA will organize a training course on *in-situ* X-ray Fluorescence and Gamma Ray Spectrometry from 26 to 30 October 2009. The training course will present the recent advances in this area as well as the benefits or applying these techniques. X-ray fluorescence (XRF) and gamma ray spectrometry techniques have successfully been applied in the field and in industrial environments for *in-situ* analysis which cover the analysis of artefacts and materials that have not been moved from their original place of deposition/storage, soil screening for metals, indoor and outdoor air pollution monitoring, screening of contaminated areas in emergency situations, mapping of large seabed area to estimate the levels and distribution of natural and/or anthropogenic radionuclides, radioactive mapping of terrestrial environment, monitoring of airborne materials and building materials, investigation of the radiation field in the vicinity of sunken objects, decontamination assessment etc.

Further information is available from: http://agenda.ictp.it/smr.php?2064.

# Publications of potential interest to ALMERA members

*Final Report on the Proficiency Test of the Analytical Laboratories for the Measurement of Environmental Radioactivity (ALMERA) Network - IAEA / AL / 152*
http://www.iaea.org/programmes/aqcs/icpt/almera_final_report.pdf

*The IAEA-CU-2006-04 ALMERA Proficiency Test on the Determination of Gamma Emitting Radionuclides* - IAEA / AL /170
http://www.iaea.org/programmes/aqcs/icpt/icpt_almera06.pdf

*The IAEA-CU-2007-04 ALMERA Proficiency Test on the Determination of Radionuclides in Water, Soil and Spinach*
http://www.iaea.org/programmes/aqcs/icpt/almera%20_rn_2007_draft_report.pdf

*The ALMERA SOIL SAMPLING INTERCOMPARISON EXERCISE IAEA/SIE/01, Trieste, Italy, November 2005* - IAEA/AL/164 http://www.iaea.org/programmes/aqcs/icpt/almera_sie_01_draft.pdf

# ALMERA Network Laboratories

**Argentina**

Comisión Naciónal de Energia Atómica
Laboratorio de Metrologia de Radioisótopos
Centro Atómico Ezeiza
Presbítero Juan González Y Aragon Nro 15
CP B1802AYA Partido de Ezeiza
Provincia de Buenos Aires (Argentina)

**Australia**

Australian Radiation Protection & Nuclear Safety Agency (ARPANSA)
Lower Plenty Road 619
Yallambie, Victoria 3085 (Australia)

Australian Nuclear Science and Technology Organization (ANSTO)
New Illawarra Rd
2234, Lucas Heights
Menai N.S.W. (Australia)

**Austria**

Atominstitut der Österreichischen
Universitäten
Schüttelstrasse 115
1020, Vienna (Austria)

Universität Wien
Währingerstrasse 42
1090, Vienna (Austria)

**Belarus**

Belarussian State Institute of Metrology
Research Department of Radiative Metrology (RDRM)
Starovilenski Trakt 93
220053, Minsk (Belarus)

**Belgium**

Studiecentrum Voor Kernenergie
Centre d'etude de l'Energie Nucleaire
Boeretang 200
B-2400, Mol (Belgium)

**Brazil**

Brazilian National Commission for Nuclear Energy (CNEN)
Caixa Postal 913
Br-37701-970, Pocos De Caldas (Brazil)

Brazilian National Commission for Nuclear Energy (CNEN)
Instituto de Radioprotecao e Dosimetria (IRD)
Avda Salvador Allende S/N - Jacarepagua
Cep - 22780-160
Rio De Janeiro, RJ (Brazil)

Brazilian National Commission for Nuclear Energy (CNEN)
Laboratório de Radiometria Ambiental
Instituto de Pesquisas Energéticas e Nucleares
Av. Prof. Lineu Prestes, 2242
Cidade Universitária - CEP 05508 000
São Paulo, (Brazil)

| | |
|---|---|
| **Bulgaria** | Executive Environment Agency<br>Ministry Of Environment & Water<br>136 Tzar Boris Iii, Blvd.<br>P.O. Box 251<br>Bg-1618, Sofia (Bulgaria)<br><br>Kozloduy Nuclear Power Plant<br>Kozloduy, 3321 (Bulgaria) |
| **Canada** | Canadian Nuclear Safety Commission (CNSC)<br>Environmental Compliance & Laboratory Services Division<br>280 Slater Street<br>P. O. Box 1046, Station B<br>Ottawa, Ontario – KIP 5S9 (Canada) |
| **Chile** | Comision Chilena de Energia Nuclear<br>Amunategui 95<br>Casilla 188-D<br>Santiago De Chile (Chile) |
| **China** | China Institute for Radiation Protection<br>270 Xuefu Street<br>P.O. Box 120<br>Taiyuan, 030 006<br>Shanxi Province (China)<br><br>Chinese Academy of Agricultural Sciences (CAAS)<br>Institute of Agro-Environment and Sustainable Development<br>ALMERA of CAAS<br>No. 12 Zhongguancun South Street<br>100081 Beijing (China)<br><br>China Institute of Atomic Energy<br>P.O.Box 275-24<br>Beijing, 102413 (China) |
| **Costa Rica** | Universidad de Costa Rica<br>Ciudad Universitaria R. Facio<br>San Jose (Costa Rica) |
| **Cuba** | Centro de Proteccion e Higiene<br>De Las Radiaciones<br>Calle 20 Entre 41 Y 47<br>Apartado Postal 6791<br>Havana, 11300 (Cuba)<br><br>Centro de Isotopos<br>Carretera la Rada Km 3<br>Guanabacoa, Apto 22<br>Havana (Cuba)<br><br>Centro de Estudios Ambientales de Cienfuegos<br>Carretera a Castillo de Jagua, km 1.5<br>Apartado Postal 5<br>Código Postal 59350<br>Ciudad Nuclear<br>Cienfuegos (Cuba) |

| | |
|---|---|
| **Cyprus** | State General Laboratory<br>Ministry of Health<br>44 Kimonos Street, Acropolis<br>1451, Nicosia (Cyprus) |
| **Czech Republic** | National Radiation Protection Institute<br>Bartoškova 28<br>140 00 Praha 4 (Czech Republic) |
| **Denmark** | Risoe National Laboratory<br>P.O. Box 49<br>Dk-4000, Roskilde (Denmark) |
| **Egypt** | National Center for Nuclear Safety & Radiation Control<br>Atomic Energy Authority<br>3 Ahmed El-Zomor Street<br>P.O. Box 7551, Nasr City<br>Cairo, 11762 (Egypt) |
| **Estonia** | Estonian Radiation Protection Centre<br>Kopli 76<br>Tallinn, Ee-10416 (Estonia) |
| **Ethiopia** | National Radiation Protection Authority<br>P.O.Box 20486<br>Code 1000, Addis Ababa (Ethiopia) |
| **Finland** | Radiation & Nuclear Safety Authority (STUK)<br>P.O. Box 14<br>Fin-00881, Helsinki (Finland) |
| **France** | IPSN/DPRE/SERNAT<br>F-91191, Gif-Sur-Yvette (France) |
| **Germany** | FTU/FZK Research Center Karlsruhe<br>P.O. Box 3640<br>D-76021, Karlsruhe (Germany)<br><br>Physikalisch-Technische Bundesanstalt<br>P.O. Box 3345<br>D-38023, Braunschweig (Germany) |
| **Greece** | National Technical University of Athens<br>9 Iroon Polytechniou Street<br>Polytechnioupoli<br>Gr-157 73, Athens (Greece)<br><br>Aristotelian University of Thessaloniki<br>Gr-54124, Thessaloniki (Greece) |
| **Hungary** | Hungarian Academy of Sciences<br>KFKI Atomic Energy Research Institute<br>P.O. Box 49<br>H-1525, Budapest (Hungary)<br><br>Hungarian Agricultural Authority<br>Food & Feed Safety Directorate<br>Central Radioanalitycal Laboratory<br>P. O. Box 1740<br>H-1465, Budapest, 94 (Hungary) |

| | |
|---|---|
| **Iceland** | Gelslavarnir Rikisins<br>National Institute of Radiation Protection<br>Laugavegur 118d<br>Is-150, Reykjavik (Iceland) |
| **India** | Madras Atomic Power Station<br>Kalpakkam, 603 102<br>Tamilnadu State (India)<br><br>Tarapur Atomic Power Station<br>OIC/Environmental Survey Laboratory<br>Via Boisar<br>TAPS Colony, TAPP(post) 401 504<br>Tarapur, Maharashtra (India)<br><br>Bhabha Atomic Research Centre<br>Radiation Standards Section<br>Mumbai, 400085 (India) |
| **Indonesia** | National Nuclear Energy Agency<br>P.O. Box 7043 JKSKL<br>Jakarta, 12070 (Indonesia) |
| **Islamic Republic of Iran** | Atomic Energy Organization of Iran (AEOI)<br>North Karegar Street<br>P.O. Box 14155-4494<br>14374, Tehran (Islamic Republic of Iran) |
| **Iraq** | Iraqi Atomic Energy Commission<br>P.O. Box 765, Tuwaitha<br>Baghdad (Iraq) |
| **Israel** | Nuclear Research Center Negev (NCRN)<br>Negev (Israel) |
| **Italy** | Centrale Elettronucleare di Caorso<br>So.G.I.N Laboratories<br>29012, Caorso, Piacenza (Italy)<br><br>Centrale Elettronucleare di Trino<br>So.G.I.N Laboratories<br>Strade Statale 31 Bis<br>13039, Vercelli (Italy)<br><br>ENEA<br>Istituto di Radioprotezione<br>Laboratorio Casaccia<br>Via Anguillarese 301<br>I-00060, Santa Maria Di Galeria - Rome (Italy)<br><br>ENEA<br>Istituto di Radioprotezione<br>Laboratorio Trisaia<br>Strada Statale Ionica 106, Km 419,5<br>I-75026, Rotondella - Matera (Italy)<br><br>ENEA<br>Research Centre<br>Strada per Crescentino<br>I-13040, Saluggia - Vercelli (Italy) |

| | |
|---|---|
| | Istituto Superiore per la Protezione e la Ricerca Ambientale (ISPRA)<br>Via di Castel Romano 100<br>I-00128, Rome (Italy) |
| | ARPA Lombardia<br>Agenzia Regionale per la Protezione dell'Ambiente della Lombardia<br>Via Juvara, 22<br>20129 Milan (Italy) |
| **Jamaica** | University of the West Indies<br>Mona Campus<br>Kingston, 7 (Jamaica) |
| **Japan** | Japan Chemical Analysis Center<br>Office of Planning and Coordination<br>295-3, Sanno-Cho, Inage-ku<br>Chiba-shi, 263-002 (Japan) |
| **Jordan** | Jordan Atomic Energy Commission<br>P.O. Box 70<br>Amman, 11934 (Jordan) |
| **Kazakhstan** | National Nuclear Center<br>Ibragimov Str. 1<br>480082, Almaty (Kazakhstan) |
| **Republic of Korea** | Korea Institute of Nuclear Safety<br>P.O. Box 114, Yusung<br>Daejeon, 305-600 (Republic of Korea) |
| | Korea Atomic Energy Research Institute<br>150 Duckjin-Dong, Yusung-Ku<br>Daejeon, 305-353 (Republic of Korea) |
| **Kuwait** | Kuwait Institute for Scientific Research<br>P.O. Box 24885<br>Safat, 13109 (Kuwait) |
| **Latvia** | Radiation Safety Centre<br>Maskavas 165<br>Riga, Lv-1019 (Latvia) |
| **Lebanon** | Lebanese Atomic Energy Commission<br>P.O. Box 11-8281<br>Beirut (Lebanon) |
| **Lithuania** | Environment Protection Agency<br>Ministry of Environment<br>A. Juozapaviciaus 9<br>Lt-9311, Vilnius (Lithuania) |
| | National Veterinary Laboratory<br>J. Kairiukscio 10<br>Lt-08409, Vilnius (Lithuania) |
| | Radiation Protection Centre<br>Kalvariju 153<br>Lt-08221, Vilnius (Lithuania) |

| | |
|---|---|
| **Luxembourg** | Division de la Radioprotection<br>Ministère de la Santé<br>Villa Louvigny<br>Allée Marconi<br>L-2120 Luxembourg |
| **Malaysia** | Malaysian Nuclear Agency (Nuclear Malaysia)<br>Bangi, 43000, Kajang, Selangor D.E. (Malaysia) |
| **Mexico** | Instituto Nacional de Investigaciones Nucleares (ININ)<br>Km 36,5 Carretera Mexico Toluca<br>Edo.De Mexico, C.P. 52045<br>Salazar (Mexico)<br><br>Comision Federal de Electricidad<br>Km 182 de la Carretera Federal 180,<br>Tramo Poza Rica<br>Puerto De Veracruz, C.P. 91490<br>Farallon, Veracruz (Mexico)<br><br>Comision Nacional de Seguridad Nuclear y Salvaguardias (CNSNS)<br>Dr. Jose Ma. Barragan # 779<br>Col. V. Narvarte, Del. B. Juarez<br>Mex-03020, Mexico City (Mexico) |
| **Montenegro** | Center for Ecotoxicological Researches of Montenegro<br>Put Radomira Ivanovica 2<br>Yu-81000, Podgorica (Montenegro) |
| **Myanmar** | Myanmar Atomic Energy Committee<br>No. 6 Kaba Aye Pagoda Road<br>Yangon (Myanmar) |
| **Netherlands** | National Institute of Public Health & Environment<br>Antonie Van Leeuwenhoeklaan 9<br>NL-3720 BA, Bilthoven (Netherlands)<br><br>NRG<br>Westerduinweg 3<br>P.O. Box 25<br>1755 ZG Petten (Netherlands) |
| **New Zealand** | National Radiation Laboratory<br>108 Victoria St.<br>P.O. Box 25099<br>Christchurch (New Zealand) |
| **Norway** | Norwegian Radiation Protection Authority<br>P.O. Box 55<br>N-1345, Oesteraas (Norway)<br><br>Institute for Energy Technology<br>Instituttveien 18<br>P.O. Box 40<br>N-2027, Kjeller (Norway) |
| **Pakistan** | Pakistan Institute of Nuclear Science & Technology (PINSTECH)<br>Mnsr Lab. Naa Acg<br>P.O.Box 1482- Nilore<br>92/051, Islamabad (Pakistan) |

| | |
|---|---|
| **Panama** | Centro de Investigacion con Tecnicas Nucleares<br>Fac. De Cienc. Natur. y Exactas<br>25 Universidad de Panama<br>Ciudad Univ. O. Mendez Pereira<br>Ciudad De Panama (Panama) |
| **Peru** | Instituto Peruano de Energía Nuclear (IPEN)<br>Av. Canadá 1470<br>San Borja<br>Lima 41 (Peru) |
| **Philippines** | Philippine Nuclear Research Institute<br>Commonwealth Avenue<br>Diliman, Quezon City, 1101 (Philippines) |
| **Poland** | Central Laboratory for Radiological Protection<br>Ul. Konwaliowa 7<br>Pl-03-194, Warsaw (Poland) |
| | Institute of Oceanology<br>Polish Academy of Sciences<br>Powstancow Warszawy 55<br>P.O. Box 197<br>Pl-81-712, Sopot (Poland) |
| | Laboratory of Radiometry of the Central Mining Institute<br>Plac Gwarkow 1<br>P.B. 3672<br>PL-40-166 Katowice (Poland) |
| **Portugal** | Instituto Tecnologico e Nuclear<br>Estrada Nacional 10<br>P-2686-953, Sacavem (Portugal) |
| **Romania** | Institute for Nuclear Research<br>P.O. Box 78, Colibasi<br>R-0300, Pitesti (Romania) |
| | Nuclear Power Plant Cernavoda<br>Stada Medgidiei, 1<br>C.P. 42<br>8625, Cernavoda<br>Jud. Constanta (Romania) |
| | Institute of Physics & Nuclear Engineering<br>P.O. Box Mg-6<br>R-76900, Bucharest<br>Sector 5 (Romania) |
| **Russian Federation** | SIA ‘Radon’<br>7th Rostovsky Ln., 2/14<br>119121, Moscow (Russian Federation) |
| | Russian Institute of Agricultural Radiology & Agroecology<br>249020, Obninsk<br>Kaluzhskaya Oblast (Russian Federation) |

| | |
|---|---|
| **Saudi Arabia** | Institute of Atomic Energy Research<br>King Abdulaziz City for Science & Technology<br>P.O. Box 6086<br>Riyadh, 11442 (Saudi Arabia) |
| **Serbia** | Institute of Occupational & Radiological Health<br>Deligradska 29<br>Yu-11000, Belgrade (Serbia) |
| **Slovakia** | Nuclear Power Plant Bohunice<br>Sk-919 31, Jaslovske Bohunice (Slovakia)<br><br>Nuclear Power Plant Mochovce<br>Komenskeho 3<br>Sk-935 39, Levice (Slovakia)<br><br>Institute of Preventive & Clinical Medicine<br>Limbova 14<br>Sk-833 01, Bratislava (Slovakia) |
| **Slovenia** | Institute Jozef Stefan<br>Jamova 39<br>P.P.3000<br>Si-1001, Ljubljana (Slovenia) |
| **South Africa** | South African Nuclear Energy Corporation<br>P.O. Box 582<br>Pretoria, 0001 (South Africa) |
| **Spain** | C I E M A T<br>Ed-7, Avda Complutense 22<br>E-28040, Madrid (Spain)<br><br>Escuela Técnica Superior de Ingeniería<br>Departamento de Ingeniería Nuclear y Mecánica de Fluidos<br>Laboratorio de Medidas de Baja Actividad<br>Alameda de Urquijo s/n<br>48013 Bilbao (Spain) |
| **Sweden** | Swedish Radiation Protection Institute<br>Solna Strandväg 96<br>S-171 16, Stockholm (Sweden) |
| **Switzerland** | Federal Office of Public Health<br>3, Chemin Du Musee<br>Ch-1700, Fribourg (Switzerland) |
| **Syrian Arab Republic** | Atomic Energy Commission of Syria<br>P.O. Box 6091<br>Damascus (Syrian Arab Republic) |
| **Thailand** | Office of Atomic Energy for Peace<br>16 Vibhavadi Rangsit<br>Chatuchak<br>Bangkok, 10900 (Thailand) |
| **Tunisia** | Centre National des Sciences et Technologies Nucleaires<br>Pole Technologique<br>Sidi Thabet, 2020 (Tunisia) |

| | |
|---|---|
| **Ukraine** | Ukrainian Hydrometeorological Institute<br>Prospect Nauki 37<br>Kiev-28, 03028 (Ukraine) |
| **United Arab Emirates** | Central Food Control Laboratory<br>Sharjah Municipality<br>Sultan Ben Saqr El Qassimi<br>P.O.Box 22<br>Sharjah (United Arab Emirates) |
| **United Kingdom of Great Britain and Northern Ireland** | Imperial College at Silwood Park<br>Buckhurst Road<br>Ascot, Sl5 7te<br>Berkshire (United Kingdom)<br><br>Veterinary Laboratories Agency<br>Woodham Lane, New Haw<br>Addlestone, Surrey Kt15 3nb (United Kingdom)<br><br>National Physical Laboratory<br>Radioactivity Metrology Group<br>F7-A7, Hamptom Road<br>Middlesex, TW11 OLW (United Kingdom)<br><br>Centre for Environment, Fisheries & Aquaculture Science<br>Pakefield Road<br>Lowestoft, Nr33 0HT<br>Suffolk (United Kingdom)<br><br>LGC Limited<br>Queens Road<br>Teddington,<br>Middlesex, TW11 0LY (United Kingdom) |
| **United States of America** | Los Alamos National Laboratory<br>P.O. Box 1663<br>Los Alamos, NM 87545 (United States of America)<br><br>U.S. Department of Energy (DOE)<br>Analytical Chemistry Division<br>Environmental Measurements Laboratory<br>376, Hudson Street<br>New Your, NY 100014-3621 (United States of America)<br><br>U.S. Department of Energy (DOE)<br>850 Energy Drive<br>Idaho Falls, ID 83402 (United States of America)<br><br>Purdue University<br>1396 Physics Building<br>West Lafayette, IN 47907-1396 (United States of America)<br><br>University of California<br>Lawrence Livermore National Laboratory<br>7000 East Avenue<br>P.O. Box 5001<br>Livermore, CA 94551 (United States of America) |

Savannah River Technology Center
Westinghouse Savannah River Co.
Building 773-A
P.O. Box 616
Aiken, SC 29802 (United States of America)

**Uruguay**

Dirección Nacional de Energia y Tecnologia Nuclear (DNETN)
Ministerio de Industria, Energia y Minoraría (MIEM)
Laboratorios del Departamento de Tecnogestión
Mercedes n1041, 2do. Piso
11.100 Montevideo (Uruguay)

**Venezuela**

Instituto Venezolano de Investigaciones Cientificas (IVIC)
Apartado Postal 21827
Caracas, 1020-A (Venezuela)

Ministerio del Poder Popular para Energía y Petróleo de Venezuela
Dirección General de Energías Alternativas
Laboratorio de Dosimetría y Medición de la Radiación de Bajo Fondo
Av. Libertador cruce con calle el Empalme
Edificio MENPET-PDVSA, Torre Oeste, piso 5
Caracas (Venezuela)

**Zambia**

National Council For Scientific Research
P.O. Box 310158
Lusaka, 15302 (Zambia)

**IAEA**

Department of Nuclear Sciences and Applications
Physics, Chemistry and Instrumentation Laboratory
Chemistry Unit
Agency's Laboratories Seibersdorf
A-2444 Seibersdorf (Austria)

Department of Nuclear Sciences and Applications
Marine Environment Laboratories
4, Quai Antoine Premier
MC980000 Monaco (Principality of Monaco)

IAEA International Atomic Energy Agency

ALMERA Newsletter No. 1
No. 1, October 2009

The ALMERA Newsletter is prepared twice per year by the IAEA laboratories in Seibersdorf.
Correspondence and materials to be considered for publishing should be sent to:

Umberto Sansone
IAEA Laboratories Seibersdorf
2444 Seibersdorf, Austria

Fax: (+43 1) 2600-28222 or (+43 1) 26007
E-mail: ALMERA@iaea.org

International Atomic Energy Agency
Vienna International Centre, PO Box 100,
1400 Vienna, Austria

Printed by the IAEA in Austria, October 2009.

09-33291