The 7th ALMERA coordination meeting took place in Addis-Ababa, Ethiopia, from 11 to 13 October 2010, organized by the Ethiopian Radiation Protection Authority and hosted by the Italian Cultural Institute in Addis-Ababa.

Welcome addresses to the ALMERA participants were delivered by Mr. Bruno Bellotto, Director of the Italian Cultural Institute in Addis-Ababa and by H.E. the Ambassador of Italy to the Federal Democratic Republic of Ethiopia, Mr. Renzo Rosso.

The meeting was officially opened Mr. Atnatiwos Zeleke Mesheha, Director General of the Ethiopian Radiation Protection Authority (ERPA).

The meeting was attended by the following 60 participants from 22 countries, representing 32 different institutions. Representatives of the Korea Institute of Nuclear Safety (KINS), as coordinating centre of the ALMERA Asia-Pacific regional group, representative of the Comissao Nacional de Energia Nuclear, Instituto de Radioprotecao e Dosimetria (CNEN-IRD, Brazil) as coordinating centre of the ALMERA North
and Latin America regional group, and representative of the Central Agricultural Office Food and Feed Safety Directorate of Hungary, as coordinating centre of the ALMERA Europe regional group, attended the meeting:

IAEA
- Chang Kyu Kim, IAEA, Terrestrial Environment Laboratory, Seibersdorf
- Umberto Sansone, IAEA, Terrestrial Environment Laboratory, Seibersdorf

Ethiopia
- Andwaleon Mengistu, Ethiopian Radiation Protection Authority (ERPA)
- Atnatiwos Zeleke, Ethiopian Radiation Protection Authority (ERPA)
- Getachew Alem, Ethiopian Radiation Protection Authority (ERPA)
- Abrha Mulu, Addis-Ababa University
- Alemaye Mamo, Addis-Ababa University
- Alemayeu Solomon, Addis-Ababa University
- Alemneu Geto, Addis-Ababa University
- Berhamu Tulu, Addis-Ababa University
- Eshetu Lemma, Addis-Ababa University
- Mekuria Gebru, Addis-Ababa University
- Mesay Getetu, Addis-Ababa University
- Shewangzaw Hamelo, Addis-Ababa University
- Tshom Legna, Addis-Ababa University
- Wordirod Aschegier, Addis-Ababa University
- Zelalem Abebe, Addis-Ababa University
- Zenebe Yirgu, Addis-Ababa University
- Abdulrejak Omar, EIPO
- Beletu Abate, ENA
- Beahaiu Ayalew, ETSE
- Alloatti Gabriella, Italian Cultural Institute
- Bellotto Bruno, Italian Cultural Institute
- Ferrando Carla, Italian Cultural Institute
- Le Piane Linda, Italian Cultural Institute
- Segreto Salvo, Italian Cultural Institute
- Soligno Desirèè, Italian Cultural Institute
- Teshome Ermias, Italian Cultural Institute
- Zegaye Fanta, Italian Cultural Institute
- Lelli Roxana, MAE
- Rebuzzi Daniele, MIUR
- Worku Woldie, QSAU
- Dereje Baym, St. Joseph School

Brazil
- de Melo Ferreira Ana, Brazilian Nuclear Energy Commission - CNEN

Bulgaria
- Avramov Valentin, Kozloduy Nuclear Power Plant

Egypt
- Ezz El-Din Mohamed, Egyptian Atomic Energy Authority
- Waleed M. Abdellah, Egyptian Atomic Energy Authority

Hungary
- Tarjan Sandor, Central Agricultural Office Food and Feed Safety
Objectives of the meeting

The overall aim of the meeting was:

- to establish an ALMERA regional group for Africa;
- to evaluate the current status of the ALMERA network;
- and to define the future activities of the ALMERA network.

Establishment of an ALMERA regional group for Africa

Currently the ALMERA network is subdivided into the following regional groups:

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

Each regional group is coordinated by an ALMERA regional coordinating centre. The regional coordinating centre should:

- cooperate and maintain close links with the central coordinator of ALMERA in order to promote and develop the ALMERA network in accordance with the priorities and targets established;
- assist in the organization of the annual coordination meeting, when it will take place in its region;
proactively encourage communications between network members, in particular for those of their regional group, and link up with the central coordinator of ALMERA;
organize regional meetings, in agreement with the central coordinator of ALMERA, on special issues of interest to the ALMERA network;
continually identify needs (training, reference materials, proficiency tests and intercomparison exercises, types of matrices and radionuclides, types of radio analytical methods, issues of concern, etc.) for the members of their regional group and identify existing gaps and suggest to the IAEA ways to address these needs;
participate in the annual coordination meeting, including when this will take place in other regions;
generally rotate every five years between members of the same regional group.

The current ALMERA coordinating centers are:
- the Korea Institute of Nuclear Safety (KINS, Republic of Korea) for the Asia-Pacific region (2007-2011);
- the Instituto de Radioprotecao e Dosimetria (IRD, Brazil) for the North and Latin America region (2009-2013);
- the Hungarian Radio-analytical Reference Laboratory of the Central Agricultural Office, Food and Feed Safety Directorate for the Europe region (2010-2014);

The ALMERA participants proposed and agreed that for the period 2011-2015, the ALMERA coordinating centre for the Africa regional group will be the South African Nuclear Energy Corporation Ltd (NECSA).

The following picture reports the complete structure of the ALMERA network.
Current status of the ALMERA network

ALMERA currently (November 2010) consists of 124 laboratories representing 78 countries. The Agency's Terrestrial Environment Laboratory in Seibersdorf (Austria) and its Marine Environment Laboratory in the Principality of Monaco are additional members of the network.

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

The following figure shows the nominations of ALMERA laboratories in the different years from 1999 to 2010.
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.

<table>
<thead>
<tr>
<th>Year</th>
<th>Coordination meetings</th>
<th>Location</th>
<th>Participants</th>
<th>Member States</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>1st</td>
<td>IAEA, Vienna</td>
<td>24</td>
<td>15</td>
</tr>
<tr>
<td>2005</td>
<td>2nd</td>
<td>ICTP, Trieste, Italy</td>
<td>45</td>
<td>29</td>
</tr>
<tr>
<td>2006</td>
<td>3rd</td>
<td>KINS, Daejeon, Republic of Korea</td>
<td>36</td>
<td>14</td>
</tr>
<tr>
<td>2007</td>
<td>4th</td>
<td>ICTP, Trieste, Italy</td>
<td>62</td>
<td>26</td>
</tr>
<tr>
<td>2008</td>
<td>5th</td>
<td>CNEN-IRD Rio de Janeiro, Brazil</td>
<td>27</td>
<td>17</td>
</tr>
<tr>
<td>2009</td>
<td>6th</td>
<td>Food &amp; Feed Safety Directorate, Budapest, Hungary</td>
<td>51</td>
<td>22</td>
</tr>
<tr>
<td>2010</td>
<td>7th</td>
<td>ERPA, Addis-Ababa, Ethiopia</td>
<td>60</td>
<td>22</td>
</tr>
</tbody>
</table>

A primary requirement of the ALMERA members is participation in the IAEA interlaboratory comparison exercises which are specifically organized for ALMERA on a regular basis. 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. At least one interlaboratory comparison exercise was organised per year by the IAEA for the ALMERA network as reported in the following table.

**Proficiency test of the Analytical Laboratories for the Measurement of Environmental Radioactivity (ALMERA)**

- **2004-2005** 53 Institutions, 37 Member States  

**Soil sampling intercomparison exercise**

- **2005** 10 Institutions, 10 Member States  

**Determination of gamma emitting radionuclides**

- **2006-2007** 38 Institutions, 29 Member States  

**Determination of $^{210}$Po in water (IAEA-CU-2007-09)**

- **2007** 36 Institutions, 30 Member States  

**Determination of radionuclides in spinach, soil & water (IAEA-CU-2007-04)**

- **2007-2008** 58 Institutions, 46 Member States  

**Determination of naturally occurring radionuclides in phosphogypsum & water (IAEA-CU-2008-04)**

- **2008-2009** 49 Institutions, 40 Member States  

**Determination of gamma emitting radionuclides in simulated air filters (IAEA-CU-2009-04)**

- **2009** 69 Institutions, 46 Member States  

In the following are reported the most recent publications of the ALMERA’s activities related to the provision of reference products and laboratory performance support.


**2006**  Comparison of different approaches to evaluate proficiency test data  

**2007**  Implementation of proficiency testing schemes for a limited number of participants. *Accred Qual Assur (2007) 12;391–398*


**2008**  Estimation of uncertainty arising from different soil sampling devices: The use of variogram parameters *Chemosphere 70 (2008) 745–752*

**2009**  Results of an IAEA intercomparison exercise to assess $^{137}$Cs and total $^{210}$Pb analytical performance in soil. *Applied Radiation and Isotopes, 67, 139 - 146 (2009).*


**2010**  The new IAEA reference material: IAEA-434 technologically enhanced naturally occuring radioactive materials (TENORM) in Phosphogypsum  

**2010**  Reference Material IAEA 434: Naturally Occurring Radionuclides in Phosphogypsum  
*IAEA Analytical Quality in Nuclear Applications Series No. 17. http://nucleus.iaea.org/rpst*

One of the most frequent requests which Member State laboratories make to the IAEA Terrestrial Environment Laboratory in Seibersdorf is that for recommended analytical procedures. Laboratories would like to have procedures available that are used at a large number of laboratories and therefore could be regarded as having been widely tested. Therefore, since 2004 the IAEA’s programme related to ALMERA has included activities aimed towards the development of a set of procedures for determination of radionuclides in environmental samples. It is intended that as these are developed, they will be made available to users, for example by publication in IAEA series and/or by placing them on the IAEA website. The latter option would allow those who are interested in a reliable source of procedures to search for them according to their requirements e.g. by analyte and/or sample type. It is not intended that the analytical procedures included should be regarded as “recommended” or “endorsed” by the IAEA for any particular purpose, nevertheless it is expected that the information will be a useful resource and starting point for analysts.

In the following are reported the most recent outcome of the ALMERA’s activities aimed towards the development of a set of procedures for determination of radionuclides in environmental samples.
The ALMERA participants proposed and agreed that for the period 2011-2015, the ALMERA coordinating centre for the Africa regional group will be the South African Nuclear Energy Corporation Ltd (NECSA).

The ALMERA participants agreed to have the 8th ALMERA coordination meeting in Damascus (Syria), in the 2nd Quarter 2011, hosted by the Syrian Atomic Energy Commission (AECS). The ALMERA participants recommended allocating time during each annual ALMERA coordination meetings, to have separate meetings of the different regional groups.
The ALMERA participants agreed to have the 9th ALMERA coordination meeting in Ankara (Turkey), in the 2nd Quarter 2012, hosted by Sarayköy Nuclear Research and Training Centre.

The South African Nuclear Energy Corporation Ltd (NECSA) proposed to host the 2014 ALMERA coordination meeting. The issue will be discussed during the next ALMERA coordination meeting in Damascus (Syria).

The Africa regional group proposed to organize in South Africa (NECSA), in October 2011 a workshop for the ALMERA regional group of Africa, on alpha spectrometry (basic principles) and radiochemical techniques (determination of uranium nuclides in water) – duration 2 weeks (1 week theory, 1 week practical).

The Africa regional group pointed out the need to enhance communication and encourage non-active members and non-members in Africa to become involved in ALMERA (through personal contacts and official channels).

The Africa regional group suggested IAEA to organize during 2012 a regional proficiency test for the Africa group on gamma spectrometry - food certification, using available IAEA reference material to conduct the exercise.

Mr. Umberto Sansone, current coordinator of the ALMERA network, will be leaving at the end of 2010 his current position at the IAEA. From the 1st January 2011, Ms. Iolanda Osvath, from the IAEA Environment Laboratories in the Principality of Monaco, will take over the central coordination of the network.

The ALMERA participants requested the IAEA to organize during 2011, in the Agency’s Terrestrial Environment Laboratory in Seibersdorf, or in the Radiometrics Laboratory of Monaco, a technical visit to discuss measurement of natural radionuclides and NORMs in environmental samples by gamma spectrometry: experimental difficulties and methodologies.

The ALMERA participants requested the IAEA to organize during 2011 a proficiency test on selected natural and artificial radionuclides in water and soil.

The Asia-Pacific and Europe regional groups proposed the re-characterization of ash sample, a candidate reference material, which was proposed already by Japan Chemical Analysis Centre (JCAC) during the 2009 ALMERA coordination meeting. The objectives is:

- to check if the candidate reference material (ash) prepared by JCAC can be used as IAEA reference material;
- to test the reliability of own procedure of $^{90}$Sr the Asia-Pacific regional group, Brazil and Iran laboratories have been used
- to prepare a harmonized procedure of $^{90}$Sr in ash sample between Asia-Pacific regional group.

The following work plan was proposed.

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
<th>Responsible Party</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 2010</td>
<td>Send the IAEA requirement for candidate reference material</td>
<td>IAEA</td>
</tr>
<tr>
<td>December 2010</td>
<td>Check if the candidate reference material which was prepared byJCAC(Japan Chemical Analysis Centre) fulfils the IAEA requirement</td>
<td>JCAC</td>
</tr>
<tr>
<td>March 2011</td>
<td>Send the candidate reference material (about 10 kg) to Hungary for re-homogenization</td>
<td>JCAC</td>
</tr>
<tr>
<td>May 2011</td>
<td>Re-homogenizing the candidate reference material and Send the homogenized candidate reference material to IAEA</td>
<td>Hungary</td>
</tr>
</tbody>
</table>
### Timeline and Actions

<table>
<thead>
<tr>
<th>Date</th>
<th>Action Description</th>
<th>Responsible Party</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 2011</td>
<td>Distribute the candidate reference material to Asia-Pacific regional group, Brazil and Iran. Send reporting form, questionnaire on $^{90}$Sr analytical method being used in each laboratory.</td>
<td>IAEA</td>
</tr>
<tr>
<td>October 2011</td>
<td>Report analysis results to IAEA</td>
<td>All participants</td>
</tr>
<tr>
<td>December 2011</td>
<td>Data evaluation, Prepare final report</td>
<td>IAEA</td>
</tr>
<tr>
<td>2012</td>
<td>Presentation of the analytical results during the 2012 ALMERA coordination meeting</td>
<td>All participants</td>
</tr>
</tbody>
</table>

The Europe regional group proposed to organize in 2013 an in situ training and exercise on a reference site in Hungary. The training and exercise will be organized by the Central Agricultural Office Food and Feed Safety Directorate of Hungary. The training and the exercise will focus on the basic tasks of the mobile units which should be applied in case of the nuclear or radiation incident, accident and nuclear terror attack.

The Europe and Asia-Pacific regional groups proposed a joint work to establish IAEA procedure for determination of $^{226}$Ra/$^{228}$Ra in fresh water and produce IAEA freshwater reference material with the following objectives:

- to produce an IAEA freshwater reference material for $^{226}$Ra and $^{228}$Ra;
- to exchange several techniques for the determination of $^{226}$Ra and $^{228}$Ra;
- to specify experimentally advantage and disadvantage of each technique;
- to prepare accurate and precise procedure for the determination of $^{226}$Ra and $^{228}$Ra in freshwater for routine monitoring and environment studies.

The candidate measurement techniques to be considered are in the following reported:

- Alpha-spectrometry;
- Gamma-spectrometry;
- Liquid scintillation counter;
- ICP-MS.

The following work plan was proposed:

<table>
<thead>
<tr>
<th>Date</th>
<th>Action Description</th>
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<tr>
<td>March 2012</td>
<td>Questionnaire survey to be sent to ALMERA members to verify the intention to participate in the project</td>
<td>IAEA</td>
</tr>
<tr>
<td>June 2012</td>
<td>Preparation of a candidate reference material, freshwater.</td>
<td>Hungary/IAEA</td>
</tr>
<tr>
<td></td>
<td>• Sample volume: 500 L</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Activity level</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Ra-226: about 0.5-1.0 Bq/L</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Ra-228: about 0.1-0.5 Bq/L</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• U: about 10 – 20 ppb</td>
<td></td>
</tr>
<tr>
<td>July 2012</td>
<td>Distribution of the samples to Europe and Asia-Pacific regional groups, Brazil and Iran for characterization of the sample. Distribution of the reporting form, questionnaire on analytical method</td>
<td>IAEA</td>
</tr>
</tbody>
</table>
A new internet ALMERA portal is going to be implemented to cover all relevant aspects of information and communications for the ALMERA network. It shall function as a public information site to inform about the network, the purpose and the activities. The second aspect is to provide the ALMERA members with a communication platform in a closed environment (using the IAEA WebSSO to identify access-rights). The platform shall work as a central hub to manage user profiles, lead to proficiency test reporting applications, provide with ALMERA internal reports and documents but also give a possibility to establish communication and share information among the member laboratories. The structure of the internal platform will be oriented strongly on the regional concept of the ALMERA organisational structure.

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<td>Reporting results to IAEA</td>
<td>All participants</td>
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<td>2012</td>
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<td>Preparation of the final report</td>
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