Dealing with nuclear waste

Managing nuclear waste safely is essential to the public acceptance of nuclear energy. MNB Editor Judith Perera asked Irena Mele, head of the IAEA’s Waste Technology Section, about the activities of her section.

**JP:** What is the work of your section?

**IM:** The Waste Technology Section is one of three sections in the IAEA Division of Nuclear Fuel Cycle and Waste Technology. We cover the back end of the fuel cycle – pre-disposal, disposal, decommissioning, remediation, disused sources management and legacy waste. We also maintain a radioactive waste database and information system. This is a wide spread of activities, and we have 26 people, including cost-free experts, organised into teams covering these topics.

**JP:** Can you describe your work on predisposal?

**IM:** We are trying to help member states deal with treatment, conditioning and storage of waste – making it ready for disposal. This includes waste characterisation where we define the type and concentration of radionuclides in waste. This is measured and recorded so we will know exactly what is being disposed of and we can make a proper assessment about the method of disposal. We help member states to design interim storage.

We are also running a number of networks as a way of better organising our assistance to member states by bringing together those who have competencies with those who are still developing and share experiences. In pre-disposal we have Labonet which focuses on waste characterisation and aims at harmonising the work of different laboratories to ensure consistent use of methodologies and tools so that results can be comparable.

**JP:** What about disposal?

**IM:** It is important to help member states to develop a consistent policy on waste disposal. Many member states are still lacking this. They need a national policy which outlines what they want to achieve and then they need to develop a strategy to achieve that. We help member states to develop disposal solutions including constructing repositories, optimising their operation and then closing them and providing ongoing surveillance and monitoring.

Different disposal solutions and facilities are applied for different types of waste - high level waste (HLW) and/or spent nuclear fuel (SNF), and intermediate and low level waste (ILW/LLW). These include near-surface and geological disposal solutions. We have two networks dealing with disposal: the Underground Research Facilities Network for geological disposal and Disponet for near-surface disposal. Our works are heavily involved in organising training for member states in this area, and partners from developed programmes often host training events. (IAEA Radioactive Waste Management Networks at http://www.iaea.org/OurWork/ST/NE/NEFW/WTS-Networks/overview.html)

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**Irena Mele** joined the IAEA in 2009 to head the Waste Technology Section in the Agency’s Department of Nuclear Energy where she is responsible for managing projects and activities in the areas of radioactive waste management, decommissioning and environmental remediation. Before her appointment to Vienna, she was Director of the National Agency for Radwaste Management (ARAO) in Ljubljana, Slovenia, and then a Member of ARAO’s Management Board. Earlier in her career, she worked as a researcher in the Reactor Physics Section of the Jožef Stefan Institute in Ljubljana where, amongst others, she was in charge of the reconstruction of the Institute’s research reactor. She has many years of experience in radioactive waste management and in nuclear research activities related to the operation of nuclear power plants and research reactors. She has been involved in many international activities, including research projects of the EU Framework Programme. She holds a Master’s Degree in nuclear engineering and an MBA and was awarded a PhD in reactor physics from the University of Ljubljana.
**JP: How do you help member states with decommissioning?**

**IM:** Decommissioning and environmental remediation are necessary when facilities come to the end of their life. There are many decommissioning strategies, and we help member states to develop plans for this. Today, new nuclear facilities are built with preliminary plans for decommissioning already in place when they are commissioned, but older facilities do not have this.

There are also different technologies for decommissioning, and new ones are still being developed. Once dismantled, a site needs to be remediated. Remediation is needed for sites with nuclear facilities, and also for former uranium mines and industries that produce NORM (naturally occurring radioactive material) waste such as phosphate production, oil and gas production, wastewater treatment, and others. The IAEA can offer help in these areas and many member states have asked for that help.

**JP: Is legacy waste a serious problem?**

**IM:** In terms of legacy waste, there is a huge amount of work that needs to be done. For example, in Russia, through the Contact Expert Group for which the IAEA is providing the Secretariat, 13 donor countries have provided financial and other support, in particular for dismantling submarines, safe removal of spent nuclear fuel and waste from former navy bases, and removing old RTGs (radioisotope thermoelectric generators) around the coast since 1996. This work will continue for a few more years with donor countries committed to provide support up to 2013.

**JP: How do you help with disused radioactive sources?**

**IM:** Disused sources are a problem. We have a specialised team which goes to countries to solve difficult situations. The focus is on high activity sources which can be a real hazard, such as those used for radioteletherapy and food and blood irradiation. Sometimes countries have no infrastructure to deal with these sources. We help countries to remove and store them if storage facilities are available or, if possible, to return them to the country of origin, or to recycle them. We have designed a special mobile hot cell which can be used in such operations in countries which cannot afford such a facility. It was designed in co-operation with South Africa and financed by the US. It can be dismantled and easily transported. It is a very innovative design and is being used in many different countries. The cell has double walls which can be filled with local sand to provide shielding when high activity sources are dismantled and packed in special containers.

**JP: How do you use your databases?**

**IM:** Our waste management databases and information systems are aimed at making information consistent. We are often asked about the global waste inventory. It is difficult to say how much waste there is in the world today because countries classify waste in different ways. However, we are trying to give at least a rough estimate of total waste. We are collecting data on waste generated by member states on a voluntary basis. Not all member states have provided data but most of the nuclear countries have done so. We are now compiling the data for 2010.

**JP: What about safety in all these activities?**

**IM:** Safety is important in all our activities. While our section is oriented towards the technology of waste management there is another group at the IAEA – the Waste and Environmental Section in the Department of Nuclear Safety and Security, which is oriented more towards safety standards. They provide the basic guidance and recommendations, and we then help member states to apply them in practice. There is a lot of work with countries now seeking to introduce nuclear power because we want to avoid a situation where programmes are launched without waste solutions. Countries should have plans in place for their nuclear waste management before they start a new nuclear programme.

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**Rosatom State Atomic Energy Corporation held the III International Forum of Nuclear Industry Suppliers ATOMEX 2011**


The objective of the Forum is to uphold suppliers’ cooperation and to provide a unique opportunity for them to demonstrate up-to-date specimens of their products and services directly to customers and specialists who are responsible for completeness and procurement in the nuclear industry. The Forum program included a walkaround of displays by representatives of customers, technical specialists, designers, operating personnel of major organizations of the industry, including nuclear power plants.

Traditionally, the Forum framed the exhibition and the conference. Director General of Rosatom Sergey Kirienko opened the Plenary session speaking on the most actual issues of the industry. Opening ceremony of the exhibition was headed by Deputy Director General, International Business and Development of Rosatom Kirill Kornorov. He kindly welcomed all the participants and noted with pleasure the tendency to Forum’s development. ATOMEX 2011 was attended by more than 650 representatives from more than 300 international companies and organizations.

Partner of the conference is SBERBANK of Russia.

For more detailed information please see http://www.atomeks.ru/en
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