

IAEA GENERAL CONFERENCE

Atoms for peace and development

In his opening statement to the International Atomic Energy Agency's 59th General Conference, held September 14–18 in Vienna, Director General Yukiya Amano referred to the United Nations summit that was to be held the following week in New York, where 17 new sustainable development goals were to be adopted. He said that the IAEA had actively participated in the process that led to the development of the goals, and he noted the clear links between the U.N.'s goals and the work of the IAEA. The areas covered by both include energy, food security, nutrition, human health, environmental protection, and water resource management.

"There is explicit recognition in the new development goals of the importance of science and technology in advancing development," Amano said. "The agency has so much to offer in this area that I often summarize our work as 'atoms for peace and development.'"

The IAEA's support for the development of individual member countries is carried out primarily through the Technical Cooperation Program. Numerous examples of advances achieved through the transfer of nuclear technology would be provided in this year's Scientific Forum, titled "Atoms in Industry," taking place later in the week. The areas to be covered, Amano said, ranged from the production of high-performance materials to the control of pollutants that cause disease. (A report on the Scientific Forum will appear in the De-

The IAEA's director general highlighted the role of nuclear science and technology in achieving the U.N.'s new sustainable development goals.



IAEA Director General Yukiya Amano addresses delegates at the agency's 59th General Conference in Vienna on September 14.

ember issue of *Nuclear News*.)

Amano offered the following examples of the IAEA's work to provide support to member countries:

■ Since the earthquake in Nepal in April, the agency has been helping the authorities test the safety of critical buildings, such as hospitals and schools, using nondestructive testing techniques, including radiography. As an example of cooperation promoted by the IAEA, Indonesia's National Nuclear Energy Agency, BATAN, provided safe, irradi-

ated food to Nepal. BATAN developed its food irradiation capacities through a Joint IAEA/U.N. Food and Agriculture Organization research project.

■ The IAEA provided equipment and diagnostic kits for the rapid identification of the Ebola virus following the outbreak in West Africa. "We have since worked with countries of the region to help them build or strengthen their capacity to respond to possible future outbreaks of Ebola and other deadly diseases which can be transmitted

U.S. Energy Secretary Ernest Moniz also spoke on September 14, the opening day of the 59th IAEA General Conference. The full text of his remarks begins on page 22 of this issue.

from animals to people,” Amano said.

■ The IAEA Program of Action for Cancer Therapy assists member states in integrating radiation medicine into comprehensive cancer control strategies. An innovative online learning tool, known as the Virtual University for Cancer Control, is being developed in Africa to provide high-quality training to health professionals.

Amano also noted that as part of its effort to encourage young people to study nuclear science and technology, the agency was hosting an event during the General Conference titled “Nuclear Olympiad: Developing a Youth Talent Pipeline,” where students were to present their research. This was the first event of its kind for the agency.

Among the highlights of the past year that Amano described are the following:

■ The IAEA’s assistance to countries that are considering, starting, or expanding nuclear power programs focuses on helping them prepare the necessary infrastructure. This year, two Integrated Nuclear Infrastructure Review missions, to Kenya and Nigeria, have already taken place, and a third mission was scheduled for Morocco in October, reflecting the growing interest in peaceful nuclear technology in Africa. The agency has also revised *Milestones in the Development of a National Infrastructure for Nuclear Power*, the key guidance document for countries preparing the needed infrastructure for a nuclear program, to reflect the experience of the past decade and feedback from member states.

■ In August, a host state agreement and related technical agreements were signed, establishing an IAEA low-enriched uranium (LEU) bank in Kazakhstan (NN, Oct. 2015, p. 38). The legal framework is now in place for full-scale implementation. The LEU bank will serve as a supply of last resort and will ensure that countries will be able to obtain LEU for nuclear power plant fuel in case of an unforeseen and otherwise unsolvable disruption to their uranium supply.

■ Preparations for the long-overdue ReNuAL project for the renovation of the IAEA nuclear applications laboratories in Seibersdorf, near Vienna, are well under way. Designs for two new laboratory buildings have been completed, and the site is being prepared for construction, with work on the new infrastructure to begin this year. The laboratories offer training to scientists, provide analytical services to national laboratories, and support research in human health, food, and other areas. Amano described the labs as “the engine” of much of the technical support that the agency provides to member states.

■ A report on the Fukushima Daiichi accident has been distributed, along with five technical volumes. “I believe that this IAEA report will provide a solid knowledge base for the future and will help to improve nuclear safety throughout the world,” Amano said. “I hope that govern-

ments, regulators, and nuclear power plant operators in all countries will continue to act on the lessons learned from the Fukushima Daiichi accident.”

Verification activities in Iran

Turning to the subject of Iran, Amano said that the IAEA Board of Governors has authorized him to undertake the verification and monitoring of Iran’s nuclear-related commitments under the Joint Comprehensive Plan of Action (JCPOA) agreed to by the P5+1 (the five permanent members of the U.N. Security Council—China, France, Russia, the United Kingdom, and the United States—plus Germany), along with the European Union and Iran, on July 14. As stated in the JCPOA, Iran will implement the Additional Protocol, which will give the agency greater access to information and to sites in Iran. “Implementation of the Additional Protocol is an essential prerequisite for the agency to be able to provide, in due course, credible assurance of the absence of undeclared nuclear material and activities in Iran,” Amano stated. “Iran has also agreed under the JCPOA to implement additional transparency measures, which will help the agency have a better understanding of Iran’s nuclear program.”

Also on July 14, Iran and the IAEA signed a road map for the clarification of past and present outstanding issues regarding Iran’s nuclear program. As agreed to in the road map, Iran has already provided the agency with explanations in writing for the clarification of the outstanding issues. The timeline provides for the road map process to be completed in December.

Security and safeguards

Regarding nuclear security concerns, Amano focused on the 2005 Amendment to the Convention on the Physical Protection of Nuclear Material, which has moved closer to entry into force, but still needs adherence by an additional 14 countries. Implementation of the CPPNM would reduce the likelihood of terrorists being able to detonate a dirty bomb in a major city, Amano said, and would also reduce the risk of a terrorist attack on a nuclear power plant that could result in a release of radioactivity. He then appealed to “all countries that have not yet done so to adhere to this important nuclear security instrument as a matter of urgency.”

Amano said that he was not able to report any progress in two areas of long-standing nuclear safeguards concerns, the potential threats from North Korea and from the Middle East. The IAEA remains unable to undertake verification activity in North Korea. “Our knowledge of the country’s nuclear program is limited,” he said.

Amano noted that his report, *Application of IAEA Safeguards in the Middle East*, shows that fundamental differences of view



Photo: Dean Calma/IAEA

Daniel Verwaerde (left), general administrator of France's CEA, and IAEA Director General Yukiya Amano hold plaques designating research centers in Saclay and Cadarache, in France, as international research hubs for use by institutions from IAEA member states.

remain on this issue among countries of the region. It has not been possible, therefore, to make further progress, Amano said, but he noted that he will continue consultations with the governments.

Amano also raised the issue of the growing demand for the application of agency safeguards. "More nuclear material and facilities are continually being brought under safeguards," he said, "and more complex facilities need to be safeguarded." The agency is also undertaking a major modernization of its safeguards information technology system. "However," Amano said, "our budget in recent years has not kept pace with developments." He asked for more financial assistance from member states so that the IAEA "can continue to offer high-quality scientific support to all countries." —*Dick Kovan*

CEA centers become first research hubs

Two French research centers have become the first to be designated an International Centre Based on Research Reactors (ICERR) under a program launched by the International Atomic Energy Agency last year. Daniel Verwaerde, general administrator of France's Commissariat à l'Énergie Atomique et aux Énergies Alternatives (CEA), announced on September 14 that the Saclay and Cadarache research centers will become international research hubs, and under the IAEA program will be available to institutions from IAEA member states for education, training, and joint research and development purposes.

"Such centers will enable researchers from IAEA member states, especially developing states, to gain access to research re-

actor capabilities and develop human resources efficiently, effectively, and, probably, at a lower cost," said IAEA Director General Yukiya Amano, during a ceremony at IAEA headquarters in Vienna, where the designation was announced. "The ICERR scheme will also contribute to enhanced utilization of existing research reactor facilities, and by fostering cooperation, to the development and deployment of innovative nuclear technologies," he added.

The designation was the result of a rigor-

ous process that included the review of the application and support documentation and an audit mission performed at the CEA sites. Also, a comprehensive evaluation was conducted and a recommendation made by an international selection committee made up of representatives from the global research reactor community and IAEA staff, explained Andrea Borio di Tigliole, head of the IAEA's Research Reactor Section.

The goal of the program is to help IAEA member states, mainly those without research reactors, to gain timely access to research reactor infrastructure to carry out research and development and to build capacity among their scientists.

According to Verwaerde, the CEA plans to welcome 15 to 20 researchers at its centers each year.

Talent rewarded at youth-focused event

Young people took center stage on September 17 during the General Conference at a double event—the Nuclear Olympiad and Developing a Youth Talent Pipeline—at which students presented their research about the peaceful uses of nuclear science and technology. This first-of-a-kind event for the agency featured two award ceremonies for high school and university students who were honored for their participation in International Atomic Energy Agency-supported youth initiatives and education competitions aimed at cultivating their potential in science, technology, engineering, and math.

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Photo: Dean Calma/IAEA

Alice Cunha da Silva (center front) took first place in the Nuclear Olympiad competition. Alexander Lazarev (in back, at center, left) and Timon Kroell (in back, at right) won first place in the IAEA-Vienna International School initiative. At far left is Aldo Malavasi, deputy director general and head of the Department of Nuclear Sciences and Applications, and at right is Janice Dunn Lee, deputy director general and head of the Department of Management, both of the IAEA.

In a press release on the event, Nicole Jawerth, of the IAEA's Office of Public Information and Communication, noted: "From a heart-warming story demonstrating the life-saving capabilities of medical radioisotopes, to fresh perspectives on nuclear technology for sustainable energy, students' presentations inspired the audience at the IAEA's 59th General Conference."

The first half of the morning event focused on the Nuclear Olympiad, which challenged university students from around the world to use their imaginations to create 60-second videos illustrating nuclear techniques for global development. The competition was organized by the World Nuclear University (WNU), with support from the IAEA, the World Nuclear Association, the OECD Nuclear Energy Agency, and the World Association of Nuclear Operators.

"The Olympiad helps raise students' awareness of nuclear areas, and to open them to future career opportunities," said Patricia Wieland, head of WNU. "It is a unique opportunity for students to showcase their creativity, knowledge, and communication skills. We appreciate the fresh, young, new perspectives the students brought to nuclear technologies with their videos."

The video that eventually won first prize, by nuclear engineering student Alice Cunha da Silva, of Rio de Janeiro Uni-

versity in Brazil, has already attracted tens of thousands of views on YouTube. Her video explored medical radioisotopes and how their use in nuclear medicine saves lives.

Following the Olympiad presentations, five groups of high school students presented projects created during an IAEA-Vienna International School (VIS) pilot initiative held from April to August 2015. Their presentations explored the introduction of cancer treatment in Ethiopia, fast reactors and the hybrid loop-pool design, fusion confinement methods, the use of nuclear medicine in the diagnosis of Alzheimer's disease, and thorium as an alternative to uranium for sustainable energy.

Twenty-five students in grades 10 to 12 took part in the pilot initiative, which brought them together with experts from IAEA headquarters and the agency's laboratories. These experts mentored the students on scientific and technological applications. The students' final projects reflected their interests in science, technology, engineering, and math, as well as the skills they gained in project development and management over the course of the initiative.

Alexander Lazarev and Timon Kroell, both 17, who made a presentation on fast reactors and the hybrid loop-pool design, were selected as the winning group of the IAEA-VIS initiative.

A nuclear emergency self-assessment tool

The International Atomic Energy Agency launched an Emergency Preparedness and Response Information Management System (EPRIMS) at a September 16 side event that was held during the General Conference and where delegates were also shown how to use it. The new Web-based tool enables member states to assess their preparedness for nuclear and radiological emergencies and share their information with other countries. Besides providing a comprehensive analysis of countries' emergency preparedness arrangements, EPRIMS identifies areas for improvement. All features have been tested with the assistance of some member states during a pilot phase.

"Without preparedness, there can be no effective response in the case of an emergency," said Elena Buglova, head of the IAEA's Incident and Emergency Center. "This new self-assessment tool will make an important contribution to preparedness levels in member states."

Assessing arrangements for emergency preparedness and response on a national level is a complex task, explained Patrick Meschenmoser, of the Incident and Emergency Center. Every emergency response system involves a broad range of stakeholders, from policy makers to fire fighters.

EPRIMS enables member states to merge all of the information on stakeholders' capabilities in a single system. It analyzes the data and is able to identify where the response arrangements are consistent with IAEA safety standards and where further improvement is necessary. Multiple users in a country can work simultaneously with EPRIMS and enter their data, speeding up the self-assessment process.

EPRIMS also offers member states the option to share the results of their self-assessment with officials in other countries. Another advantage of EPRIMS is that it provides an additional basis for harmonizing responses to transboundary emergencies within a region.

Accurate technical information on nuclear power reactors is vital, both for the IAEA and its member states, to respond effectively to an emergency. This kind of information is also necessary for the agency to perform post-Fukushima mandated assessments and make prognoses during an emergency. EPRIMS includes a database of detailed technical information on nuclear power reactors and the option to share the data with other member states, thereby facilitating international cooperation. The reactor technical information in EPRIMS complements the IAEA Power Reactor Information System database with which it is linked. "To aggregate this essential data

is the second feature that makes EPRIMS unique and a truly international knowledge database," Buglova said.

Preparations started for new IAEA labs

Preparations have now begun for the construction of new International Atomic Energy Agency nuclear laboratories near the Austrian town of Seibersdorf under the Renovation of the Nuclear Applications Laboratories (ReNuAL) project. Director General Yukiya Amano made the announcement on September 14, the opening day of the General Conference. He also spoke at the ReNuAL Exhibit, held during the General Conference, which included a model of the new facilities.

IAEA laboratories have operated at the Seibersdorf site since 1962, providing training and responding to global challenges in food and agriculture, human health, the environment, and the development and use of advanced scientific instruments. According to the agency, the laboratories have been crucial in many areas of study, including the global eradication of rinderpest, a highly contagious viral disease afflicting cattle, and in developing drought-resistant plant varieties to help countries adapt to changing climate conditions.

The first nuclear applications laboratory

building scheduled for construction is the Insect Pest Control Laboratory, which will focus on the implementation of environmentally friendly and sustainable methods, using nuclear techniques, to control insect pests to protect crops and livestock. The new lab is to be operational in late 2017.

According to the announcement, the ReNuAL project is now seeking to raise an additional €10 million (about \$11.3 million) for the second laboratory building, the Flexible Modular Laboratory (FML), which is designed to house laboratories with similar activities to allow for the sharing of equipment and certain types of laboratory space. For this reason, the FML will house the Food and Environmental Protection Laboratory, the Soil, Water Management and Crop Nutrition Laboratory, and the Terrestrial Environment Laboratory.

The laboratories are key in providing IAEA assistance to member states, especially developing countries, said Tebogo Joseph Sekolo, South Africa's ambassador to the IAEA and co-chair of the Friends of ReNuAL Group, a group of member states supporting the project. The progress made so far would not have been possible without the generous support of member states, but, Sekolo stressed, "Having provided critical services for 50 years, these labs require a facelift. There is no time for complacency. We need more funding."

Section continued