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IAEA

INPRO issues action plan, vision statement

"Nuclear power must be safe in all aspects if it is to be a viable contributor to sustainable development," said Alexander Bychkov, project manager of the International Atomic Energy Agency–led International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO), in a written message to *Nuclear News*. He said that the March 2011 accident at Fukushima Daiichi will loom large in all safety discussions over the next several months as the world nuclear community—"not just Japan and not just the agency, but all of us"—focuses on lessons learned from the accident.

"We all have to consider what needs to be changed, and what does not, in operating nuclear power plants, as well as what needs to be designed into every new plant, so that any given nuclear power plant can cope with the maximum hazard it may meet," Bychkov said.

Speaking earlier as the IAEA's deputy director general for nuclear energy, Bychkov referred to the agency's Action Plan on Nuclear Safety, which was approved in September. "INPRO has a valuable role," he said, "in that one of the key aspects of long-term safety is the design and construction of plants that have built-in innovations to resolve safety issues. INPRO must ensure that operator-sensitive safety designs are deployed as nuclear energy expands its reach."

The INPRO methodology—the project's flagship tool for assessing the sustainability of a country's existing or planned nuclear energy system—is to be revised and enhanced over the next two years. INPRO group leader Randy Beatty said that the upgrade will be based mainly on feedback from member states that have applied the methodology in carrying out national nuclear energy system assessments.

At its latest meeting, held November 2–4, the INPRO Steering Committee adopted two key documents. One sets out an action plan for the current (2012–2013) biennium, and the other is a "development vision" covering the five-year period 2012–2017.

Key activities

Several new activities are planned for the current biennium, among them a project referred to as the Synergetic Nuclear Energy Regional Group Interactions Evaluated for Sustainability (SYNERGIES), which is to build on the analytical framework developed within the INPRO project called Global Architecture of Innovative Nuclear Energy Systems (GAINS). SYNERGIES plans to model and examine more specifically the various forms of collaboration among nuclear technology suppliers and users.

Proliferation Resistance and Safeguardability Assessment is another new activity in which INPRO and the Generation IV International Forum continue their close cooperation and collaboration by developing a set of tools and methodologies to assess the proliferation resistance and safeguardability of nuclear energy systems.

A project called Roadmaps aims to answer the question: What needs to be done, when and by whom, to achieve a collaborative transition to sustainable nuclear energy systems?

Another new project, Load-Following Capability in Innovative Designs, will be a collaborative activity focusing on design features of nuclear power plants that allow a load-following capability. It aims to assist countries in planning for the introduction or expansion of nuclear power in accordance with the demands of their electricity grids.

The November steering committee meeting, chaired by Robert Speranzini, of Canada, was attended by all 34 current members: Algeria, Argentina, Armenia, Belarus, Belgium, Brazil, Bulgaria, Canada, Chile, China, the Czech Republic, Egypt, France, Germany, India, Indonesia, Italy, Japan, Jordan, Kazakhstan, Korea, Morocco, the Netherlands, Pakistan, Poland, Russia, Slovakia, South Africa, Spain, Switzerland, Turkey, Ukraine, the United States, and the European Commission. Israel has decided to join the project, and it has since become the 35th member.

Setting up SYNERGIES

A group of 18 international experts met October 10–14 in Vienna to discuss the first steps toward launching the SYNERGIES project, as well as to define its overall structure and scope. An IAEA report says that the meeting, chaired by Geoffrey Edwards, of Atomic Energy of Canada Limited, included participants from Belgium, Canada, China, France, India, Indonesia, Romania, Russia, Spain, Ukraine, the United States, the EC's Joint Research Center, and the World Nuclear Association (WNA).

The report says that the meeting developed basic elements of an implementation plan, including task objectives and descriptions, and the interrelationships between the tasks of the project. The SYNERGIES objective, according to the report, is "to identify and evaluate mutually beneficial collaborative architectures, and also the driving forces and impediments for achieving globally sustainable nuclear energy systems."

It was also decided that the project will focus on short- and medium-term collaborative architectures capable of developing pathways to long-term sustainability. Following the approach established in GAINS, drivers of and impediments to collaboration among countries will be assessed using appropriately defined key indicators in economics, security of supply, resource constraints, national infrastructure requirements, aspirations of being a technology provider, and proliferation resistance, as well as other subject areas of INPRO.

According to SYNERGIES scientific secretary Vladimir Kuznetsov, 22 countries (Argentina, Armenia, Belgium, Belarus, Brazil, Canada, China, France, India, Indonesia, Israel, Italy, Jordan, Japan, Pakistan, Korea, Romania, Russia, Spain, Ukraine, the United States, and Vietnam) along with several international organizations (the EC, the International Science and Technology Center, the Nuclear Energy Agency, and WNA) have expressed interest in joining the project, which is to be completed in this biennium (2012–2013), with the final report produced in 2014.

The five-year vision

Beatty said that activities under the Development Vision program will be focused on four main areas:

- *National long-range nuclear energy strategies*—INPRO will help member states develop national strategies, with the help of the methodology and other tools, and support them in implementing long-range nuclear energy deployment decisions.
- *Global nuclear energy scenarios*—These will be built on the basis of scientific-technical analyses that lead to a global vision on sustainable nuclear energy development in the 21st century.
- *Technological and institutional innovations*—INPRO will investigate selected innovative nuclear energy technologies and related R&D, as well as innovative institutional arrangements, with the aim of supporting countries pursuing such innovations.
- *Policy and dialogue*—These will foster information exchange on key issues of mutual interest to nuclear technology users and technology holders, mainly through dialogue forums.

"The INPRO dialogue forum format," Beatty said, "brings together nuclear technology holders and users from interested members so they can freely discuss issues that concern them related to sustainable nuclear energy development and deployment."—*Gamini Seneviratne*