



## Russia-Japan Partnership Gathers Momentum

**Rosatom discussed Fukushima Daiichi cleanup projects in Japan. Russia's state-owned nuclear corporation offered its disaster cleanup know-how to Japanese colleagues. Specifically, the parties discussed the possibility of joint efforts to remove the molten core from the damaged reactors.**

In early April, Rosatom CEO Alexei Likhachov visited Japan to have talks with Hiroshige Seko, Japan's Minister of Economy, Trade and Industry, and Hirokazu Matsuno, Minister of Education, Culture, Sports, Science and Technology. The talks were a logical continuation of the memorandum on civil nuclear

cooperation signed last December and focused on the possibility of using Russian radioactive waste disposal and nuclear decommissioning solutions. "We had negotiations with the Minister of Economy, Trade, and Industry and the Minister of Education, Culture, Sports, Science and Technology, and visited the Fukushima nuclear plant. Each of these talks was productive and brought certain results. They are either a new agreement or a commitment to signing new documents or practical implementation of earlier agreements," Alexei Likhachov said in an interview to Russian media.

### Visit to Fukushima 1

The Russian delegation inspected the site of Fukushima 1 to see the progress of cleanup operations. "Our Japanese partners are making noticeable headway in their recovery efforts. Russia has offered technologies that are both feasible and cost efficient," Mr. Likhachov noted. According to him, cleanup operations are the best example of how the two countries work together in the nuclear area. "Solutions we offer are both



effective and efficient and can save a part of those tens of billions of US dollars to be spent on disaster cleanup. The first project is already on its way as we won a contract for the development of a neutron detector to be used for radiological assessment of the reactor core. I believe that this project will be a small breakthrough that will open doors for more contracts," Alexei Likhachov said. Rosatom has repeatedly voiced its readiness to help Japan recover from the effects of the Fukushima accident.

In the autumn of 2014, the Japanese government selected Rosatom's subsidiaries RosRAO and Khlopin Radium Institute as partners for the pilot project to test a new technology for removing tritium from liquid radioactive waste accumulated after the accident at Fukushima 1, where tritium content is hundred times higher than the maximum permitted level.

Technologies in current use at the station are capable of cleaning the waste from cesium and strontium isotopes, but not from tritium. Russian nuclear engineers created a pilot cleanup plant that was successfully tested earlier this year at one of RosRAO's test sites.

In late 2015, German-based Nukem Technologies (controlled by Rosatom's subsidiary AtomStroyExport) and Japan's

Mitsubishi Heavy Industries concluded a contract to carry out four feasibility studies for the recovery projects to be run at Fukushima.

### **Projects in third countries**

"Our civil nuclear cooperation surely goes far beyond the power industry. Japan puts in much effort in the development of nuclear medicine and nuclear technologies for agriculture. My hope is that our colleagues will also be interested in these areas of cooperation," Rosatom CEO said in the interview. According to Alexei Likhachov, Rosatom and its partners in Japan are already discussing the possibility of joint projects in third countries. "No less important is that we can join our competencies with Japanese nuclear companies well known both in and outside the country. We might reach an agreement to deliver joint projects in third countries," he noted.

### **FOR REFERENCE**

The memorandum on cooperation with Japan was signed on 16 December by Rosatom CEO Alexei Likhachov, Japan's Minister of Economy, Trade, and Industry Hiroshige Seko and Minister of Education, Culture, Sports, Science and Technology Hirokazu Matsuno in the presence of Russia's President Vladimir Putin and Japanese Prime Minister Shinzo Abe. Key areas of cooperation set out in the Memorandum are post-accident recovery at the Fukushima Daiichi Nuclear Power Plant, radioactive waste management, possible decommissioning, and prospects of creating a single environment for the exchange of expertise and knowledge between Russia and Japan to promote innovative nuclear technologies.

## TECHNOLOGY



## Multi-D System Named Mega- Project

**The Mega-Project title was won by the project management system developed by ASE Group (Rosatom's engineering division) at FIATECH CETI Award 2016. You will find more details on the system in our report.**

The life cycle management based on Multi-D® Technology at Rostov NPP won the first prize in the Mega-Project Multi-Roadmap Element category at CETI Award 2016. ASE Group engineers have worked on the unique Multi-D technology for the past 10 years. It is well known from experience that the risk of cost overruns and delays is inherent in large-scale construction projects. It can be minimized only if IT tools and business processes are properly combined and supplement each other. Developed by Russia's nuclear engineers, the Multi-D

system has proved to be an effective and reliable solution.

Multi-D offers a more flexible grip on time, budget and quality parameters in capital construction projects. The idea to develop the system is rooted in ASE's positive experience in design and construction project management and the use of software solutions developed by Dassault Systemes, particularly its 3D EXPERIENCE platform.

As practice of using Multi-D in Russia shows, a careful choice of tools facilitates delivery of any project while sticking to the budget. A perfect example is the construction of new power units at Rostov and the Yuzhnouralskaya Thermal Power Plant (Units 1 and 2).

### How it works

The Multi-D Technology uses detailed 3D representations to model construction and installation processes, optimize construction operations during the preparatory phase, analyze different scenarios of resource consumption and, if



needed, improve 3D model during the course of the project. Apart from the spatial model of facilities under construction (including drawings and 3D visualization), the Multi-D technology incorporates a construction schedule (based on standard progress rates) and quantified construction data. The level of detailing in the Multi-D system is that of Level 4 project schedule. Construction and installation plans based on this schedule are stepwise applied to construction levels, premises and installation areas.

## **Worldwide recognition**

The award ceremony took place at FIATECH Technology Conference & Showcase in Orlando (Florida, USA). Projects nominated for the award were considered by an international panel of experts from the USA, United Kingdom, France, Japan and Norway. CETI Award was established by FIATECH, one of the world's most respected industrial associations. FIATECH is a large industrial consortium and association bringing together the international engineering community, engineering companies and PLM software vendors. The first prize won by Multi-D® technology in the Mega-Project category

means that the Russian life cycle management system for the nuclear industry follows strategic global trends. According to Valery Limarenko, CEO of ASE, recognition of Rosatom's Multi-D system by the world community also means that the nuclear industry as a hi-tech economic sector, plays a leading role in the development of life-time management tools for sophisticated engineering facilities. 'Russia's technology leadership is very meaningful. The award received from FIATECH testifies to the fact that Rosatom is a leading player of the nuclear design and construction market', Limarenko said.

## **Not the First Award**

This is not the first time the Russian technology has earned the world's recognition. In recent years, the Multi-D system has been repeatedly named by international experts as an efficient solution in the design and construction industry and won various awards. For instance, ASE-designed Multi-D-Based Project Management System won its first prize in Operational Excellence category at the World Nuclear Exhibition in June 2016. The ceremony took place in Le Bourget (Paris).

## **IN FOCUS**



## **Hungary to Appoint Minister for Paks Expansion**

### **The new minister will supervise the construction of new reactor units at Hungary's sole nuclear power plant in Paks.**

This was announced by Hungary's Prime Minister Viktor Orbán speaking in the parliament. According to him, the new minister will be also responsible for handling all issues that might arise during the project. Orbán stressed that Fidesz – Hungarian Civic Alliance party supported development of both nuclear and renewable energies, but nuclear energy appeared to be much cheaper for the country in the years to come.

János Süli, the mayor of Paks, will be appointed to the ministerial position. In an interview to ATB television broadcaster, he confirmed that Prime Minister Viktor Orbán had requested him to fill the position. As a minister, he will work in close cooperation with Attila Aszódi, Hungarian Government's commissioner for the Paks expansion project. According to János Süli, the date of appointment is not fixed yet since it requires amendments to the legislation and a snap election of Paks' new mayor.

## **About Paks II**

The Paks II construction project is carried out under a framework agreement signed in January 2014 and contracts between MVM Paks II and NIAEP (a Rosatom Group company).

Still in its preparatory phase, the project has already received a license from local environment protection authorities. An application has been sent to Hungary's regulator to issue a construction license. Construction of the new reactor units is expected to start in 2018 as the European Commission finally gave its approval on 6 March.

## **Economic contribution**

Power generated by Hungary's operating units satisfy a third of its domestic demand for electricity. Once they are shut down, their capacity will have to be replaced with another power source. Replacement options for Hungary are limited – it is either construction of new capacity in the country or import of electric power from abroad. But it is natural that a country wants to be self-sufficient in energy. Besides, the last winter in Europe showed that relying on energy imports was short-sighted at best. As it is, 30% of energy consumed by Hungary is already imported. For these obvious reasons, Hungary will need an internal power source to provide base

load after the 2030s. No less obvious is that the 2,000 MW capacity cannot be replaced with renewable sources. Power stations fired with coal or gas will not make up for this capacity either since their share in the European energy mix is to be reduced under the EU strategy for combating climate change and greenhouse gas emissions.

In this context, Hungary's decision to swap its existing nuclear capacity for new reactors on the same site seems logical. A more viable solution is now hard to find. Another strong argument for keeping nuclear power in Hungary's energy mix is the cost of electricity generated by Paks, now only 11 forints per kilowatt. Thanks to low generation costs, Hungarian consumers pay about 10 eurocents for one kilowatt of electricity, while the price in Germany is nearly 30 eurocents.

Economic impact is an absolute benefit that a large-scale nuclear project brings to its home country. Nuclear construction boosts national economy, increases employment, brings in new contracts for local businesses and tax revenues for the budget, and facilitates research. The Paks II project will create up to 10,000 new jobs. From the very beginning, the Hungarian government had been showing commitment to the project and taking a strong stand in the talks with the European Commission. As a result, the EC agreed to Hungary's point, and the project was cleared. Hungary serves as a model for countries planning to build new sources of nuclear power. Step by step, the country was working its way to the construction of new reactors and securing national energy self-sufficiency.

Rosatom as a technology vendor was a logical choice for Hungary that has had a positive experience of working with VVER technology and Russian experts at the operating reactors of the Paks nuclear plant. Russia's new VVER-1200 is among the world's best Generation 3+ reactor designs. More important is that the new

design has already been proven in use at the Novovoronezh nuclear plant and put in commercial operation in late February.

Russia will also provide Hungary with an attractive loan to finance 80% of the project costs.

## IN BRIEF

### **AEM Manufactured Steam Generators for Belarus NPP Unit**

Russia's AEM-Technology has manufactured a set of PGV-1000M steam generators for Unit 2 of the nuclear power plant under construction in Ostrovets (Belarus).

The machines have been accepted by a commission from Belarus and are prepared for shipment. Experts from the quality control department performed a total of 315 quality tests on each of the steam generators, which are referred to class 1 safety products. With over 4 meters in diameter, 5 meters high and 16 meters long, each steam generator weighs 378 tons and has an operating life of 40 years. Belarus NPP, now under construction 18 km away from Ostrovets (Grodno Region, Belarus), will feature two Generation III+ units with VVER-1200 reactors. The nuclear island was designed by AEM's subsidiary OKB Hidropress.

### **Nuclear Agreement with Cuba Takes Effect**

The Russian-Cuban agreement on peaceful uses of nuclear power has come into force on 29 March.

The framework agreement was signed on the sidelines of the 60th IAEA General

Conference in Vienna on 27 September 2016. The agreement creates a legal framework for further cooperation between Russia and Cuba in peaceful uses of nuclear power, including fabrication of radioisotopes and their use in industry, medicine, agriculture, environmental protection, research, nuclear medicine, radiation technologies, and staff training for the nuclear industry. The agreement also provides for joint fundamental and applied research on peaceful uses of nuclear power, disposal of radioactive waste and ionizing radiation sources, etc.

### **Kudankulam Starts Mobile Medical Unit**

On 28 March, the Kudankulam nuclear power plant got a mobile medical unit on the road as part of its commitments under the corporate social responsibility program.

The unit will provide medical care for residents of neighboring villages. The 'clinic-on-wheels' will operate as a mobile unit of Bejan Singh Eye Hospital for three years. Project costs totaling 14 million rupees (approx. USD 220,000) will be financed entirely by Kudankulam.