



First Concrete Poured for Rooppur

Bangladesh has made another step towards its first nuclear power plant. A new milestone passed in late November as the first concrete was poured for the basement of Unit 1 on the plant's site. This marks the beginning of a construction process that will result in the country's first power generation facility with a service life of no less than a century. More details from the site can be found in our report.

The first concrete pouring ceremony took place less than a month after the Bangladesh Atomic Energy Commission (BAEC) obtained a construction license

for the country's first nuclear power plant. The ceremony was attended by Sheikh Hasina Wazed, Prime Minister of Bangladesh, and Alexei Likhachev, CEO of Russian nuclear corporation Rosatom. "Construction of a nuclear power plant is a long-nurtured dream for Bengali people, and today we have made another step towards our dream coming true. Bangladesh becomes a part of the nuclear world.

The Rooppur Nuclear Power Plant will be built with the latest technology, and we are thankful to Russia and Russian people for it," Sheikh Hasina said. "Today we are beginning to build a facility that will have a service life of at least 100 years. This means that we are laying a foundation for friendship and cooperation for ourselves, our children and grandchildren. Exactly the same power plant with an innovative VVER-1200 unit operates in Russia. We will build this

plant in Bangladesh with the same care and attention as we did in Russia,” Rosatom’s CEO Alexei Likhachev said. Yafes Osman, Minister of Bangladesh for Science and Technology, believes that the first Bangladeshi nuclear power plant will supply the country with electric power for a century. “Initial investment in the project might seem to be too high, but in the long term it is not. The nuclear power plant will satisfy internal demand for power and improve the country’s reputation since Bangladesh will be the 32nd nation to use nuclear power.” With construction of a nuclear plant, Bangladesh enters the elite club of nuclear countries, he said.

Our readers should remember that site preparations, development of engineering design documents and submissions for the construction license were done in 2015–2016. In 2017, the Rooppur NPP project continued in accordance with the time schedule, which provides for Unit 1 to be commissioned in 2023 followed by Unit 2 in 2024.

The Rooppur Nuclear Power Plant will have the latest VVER-1200 reactors of the Generation 3+ design. The world’s first reactor of this class was brought online earlier this year at Novovoronezh II in Russia. It is an evolution of Generation III reactors and is fully compliant with international safety standards. In 2017, the new unit of Novovoronezh II was named the world’s Top 3 nuclear reactor unit by the POWER Magazine (USA).

The Rooppur project is based on the defense-in-depth concept, which is fundamental for the plant’s overall safety. This concept provides for multiple defense levels and mitigation of accidents and human error, thus securing environmental safety.

EXPERT COMMENTS

Shafiqul Islam, Chairman, Department of Nuclear Engineering, Dhaka University:

“Nuclear science gives us knowledge that we need in every aspect of our life, including politics, economics, defense and social areas. Nuclear science is good for the country and is very important for the country’s future. The Rooppur Nuclear Power Plant will enable the country to use nuclear science. Ambitious students need to study this science for the sake of the country. The nuclear power plant to be constructed in Bangladesh will make a large contribution to the country’s economy. Power is a must for the economic development of the nation. Industries will flourish if they are provided with sufficient power. Electricity will play an important role in the country’s transformation into a middle-income economy.”

Ishtiaque Maoyeen Syed, General Secretary, Bangladesh Physics Society, Professor, Dhaka University:

“The Rooppur Nuclear Power Plant alone will meet the country’s large demand for power. The country won’t prosper without sufficient sources of energy and power, and the process of industrialization will stagnate. The garments industry is already moving from our country and, considering all these facts, it is a must to meet the energy and power demand. We are moving towards the use of uranium, which is a well-timed decision. Energy that a kilogram of uranium yields is equivalent to power generated by 55 kilograms of coal. Going nuclear is great since nuclear power will not pollute the environment and is cheaper in the long run. Also, Bangladesh has very limited options how it can meet the country’s demand for energy and power. Gas reserves are depleting, while

liquefied natural gas, which is soon to be imported, is costly. Prospect of wind and solar generation in Bangladesh are very poor. Solar power is not that feasible in our country for certain reasons. We can use solar power differently in our country. We may go for solar cell coated glass panels that are suitable for windows. And whatever might be said, solar power is not that much sustainable. Considering all these facts, nuclear power seems to be the best option for Bangladesh. Besides, nuclear power plants do not emit as much carbon as gas or coal fired plants, and this is another advantage of nuclear generation.

Rashid Sarkar, Director, Engineering and Technology, Institute of Nuclear Power Engineering, Dhaka University:

“The process of industrialization in Bangladesh is being disrupted by the shortage of power. Industrialization cannot reach the intended level. Even in Chittagong, businessmen are craving for

power with idle money in hands but cannot get what their need to start their business. The Rooppur Nuclear Power Plant will play a key role in the development of the country’s economy as soon as it is commissioned. Nuclear will provide us with low-cost electric power for at least 80 years and make the country more recognizable on the world map. The nuclear power plant will also improve our technical capabilities and make us more self-dependent. The nation’s self-esteem will be raised to an entirely new level with this nuclear power project. The nuclear plant is a long-awaited project. Russia invests in the project at a low interest rate, which is an advantage for us. Local engineers will have a chance of operating the plant, and training courses are being organized to make them competent for that job. This power plant will also widen the window of opportunity to learn, practice and study the nuclear science for Bangladeshi students, engineers and experts.”

CONSTRUCTION

Reactor Vessel in Place

Important news has come from the Belarus NPP construction site where the reactor vessel was placed in its permanent position in the pit of Unit 2.

This is one of the most important milestones in the nuclear reactor construction process and a starting point for the installation of core components of the primary circuit. The milestone was passed on the 2nd of December as the reactor vessel was installed in its permanent position. According to ASE (a Rosatom Group company), the installation process was divided in two



stages. First, the 330-ton 11-meter long and 4.5-meter wide vessel was lifted with a gantry crane and put on a special flatcar to be transported by rail into the containment. Then the vessel was moved with a polar crane into the central hall of the reactor island and placed on the supporting ring inside the reactor pit.

“Emplacement of the vessel is one of the most complicated operations in the

construction process and requires much attention,” said Vitaly Medyakov, ASE Vice President for Belarus NPP Project. “Since the support ring bears the entire load, the allowable deviation between the axes of the vessel and the ring is just one millimeter.”

The Belarus NPP will have VVER-1200 reactor (VVER is a Russian acronym for ‘pressurized water power reactor’). For now, it is the most powerful Russian-designed reactor featuring high performance, 60 years’ long service life and unparalleled safety.

The Belarus Nuclear Power Plant is based on one of the world’s most advanced designs and complies with the most stringent international regulations and IAEA guidelines. The key advantage of the project design is a combination of active and passive safety systems, with project solutions being fully compliant with post-Fukushima safety standards. In Russia, a reactor unit of the same design is in operation at Novovoronezh.

Earlier, the Nuclear and Radiation Safety Department of the Belarusian Ministry of Emergency Situations published a national report on nuclear safety stress tests carried out at the nuclear power plant constructed near the Belarusian town of Ostrovets (Astravets). The report proves that the Russian-designed plant with Generation 3+ reactors meets the strictest international safety standards. Adopted after the Fukushima disaster in 2011, these standards were designed to maintain safety of nuclear facilities in case of core system failures or external impacts. The report was submitted to the European Nuclear Safety Regulators Group (ENSREG) and European Commission for approval. Belarus drew attention to the fact that stress tests were carried out in accordance with EU standards, and their results were submitted to the European Commission and, under the nuclear safety openness and transparency commitments made by the country, made available for public audience.

IN FOCUS

Almost half Hungarian

At least 15 large contracts worth up to 2 billion US dollars will be put out to tender as part of the Paks II construction project by the end of 2018. The project’s high local content is provided for in the agreement between Russia and Hungary. Local suppliers learned about Rosatom’s procurement rules and procedures at the Atomex Europe forum in Budapest.

“Hungary will do its best to secure 40% of local content as agreed between the parties,” said János Süli, Minister for Design, Construction and Commissioning of Paks II. “This matter is handled by the state secretary who is also responsible for



informing and consulting potential vendors and contractors from Hungary.” Rosatom also lays stress on local content, said Kirill Komarov, Rosatom’s First Deputy CEO for Corporate Development and International Business. “We expect broad and active involvement of Hungarian and other European companies in the project. There will be

much teamwork, and the foundation for it has been laid,” he said.

The target level of local content in the Paks II construction project is based on its technical specifics and competencies of Hungarian companies. The local contribution will be larger in certain operations, such as construction and installation.

Contracts to be tendered out soon

The project is gaining momentum. The work is ongoing to develop technical documents, prepare submissions for design and construction licenses, and establish contacts with suppliers. Rosatom is accumulating license documents to submit them to the customer. The regulator will receive them no later than in July 2018. “Our cooperation with Hungarian partners is efficient at every level,” Kirill Komarov noted.

Next year Rosatom plans to tender out at least 15 contracts for products and services worth nearly 2 billion US dollars. A supplier of machinery for the turbine island is expected to be announced by the end of this year. Two tender bids have been received so far, from Power Machines (Russia) and a consortium formed by Alstom Power Systems and the Hungarian subsidiary of General Electric.

In compliance with EU rules

All procurements for Paks II are fully transparent and meet EU standards. Information about new tenders is published on dedicated websites and in national and international media. For instance, the tender for turbine island equipment was published on 10 websites,

and there were over 20 news releases in the media. All in all, about 15 thousand companies, including 500 foreign suppliers, take part in Rosatom’s nuclear plant construction projects. The Russian nuclear corporation expects the number of local suppliers to grow.

According to expert estimates, the Hungarian economy will receive 40–60 billion US dollars over 60 years of Paks II operation. Each dollar invested in the project will pay almost 2 dollars to local equipment suppliers, add 4.3 dollars to the Hungarian GDP, and bring 1.5 dollars in government taxes.

A smart town of Paks

2018–2027 will be an active construction phase. About 7,000 people will move into the region during this period. According to State Secretary Atilla Becskeházi, who is responsible for the project-related infrastructure, innovation and local content, a ‘smart’ town will be created to provide these people with accommodation and social facilities for the project period. It will bring together 47 settlements. “The Paks II project will be a burden for Paks and neighboring towns and villages, so we need to ease this burden for the period of construction. The first thing to be done is to improve infrastructure, road and communications, and build a bridge between Paks and Kalocsa,” he said. To accommodate workers and their families, Paks needs to build 1,500 permanent and 3,300–3,500 temporary apartments. Their location, layout and other details are coordinated with Russia. According to estimates of Atilla Becskeházi, there will be a total of 500 projects delivered in the area. All of them are targeted at life quality improvement.

STRATEGY



Russian Wind Industry Gains Momentum

Rosatom's subsidiary NovaWind and Dutch wind turbine manufacturer Lagerwey established a joint venture, RedWind.

The new joint venture will draw on Lagerwey technology to organize production of wind turbines in Russia with NovaWind's supply chain and project delivery expertise. RedWind was formally launched at the Wind Europe exhibition in Amsterdam on 30 November 2017. The joint venture agreement was signed by Alexander Korchagin, CEO of NovaWind, and Huib Morelisse, CEO of Lagerwey. It builds on the license agreement signed by the companies earlier this year in Moscow. The CEO of the joint venture will be Emin Askerov, Deputy CEO of NovaWind. Sjoerd Sieburgh Sjoerdsma, Lagerwey's Director for Licensing and Joint Businesses, was appointed Managing Director. The rest of the management team will be appointed in the near future to include the best professionals from Russia and the Netherlands.

RedWind will market and sell wind turbines, deliver turn-key projects, and provide after-sales maintenance services. Its other task is to organize local production of wind turbine components.

The joint venture will be responsible for selecting suppliers and procuring turbine parts and materials to be used at NovaWind's production facilities in Volgodonsk (Russia). The current production plan provides for the joint venture to deliver 388 wind generators by 2022. VetroOGK will be an owner of wind parks to be constructed in Russia and a supplier of electric power.

"The agreement is a result of consistent efforts made by our joint team after the license agreement was concluded. The document we have signed today reinforces firm commitments of the parties to implement the Russian wind power generation program. I am speaking with confidence today as I am sure that we have all necessary competencies to deliver the project based on the latest technology and having a strong management team," said Alexander Korchagin, CEO of NovaWind.

Huib Morelisse, CEO of Lagerwey, noted, "The joint venture comes logically from our plans to create a cutting-edge wind generation industry in Russia. Together, we lay the ground for a new market with vast potential. And we are proud to know that the foundation of this market will rely on Dutch technologies."

Lagerwey will transfer its production technology to the Russian partner that will manufacture 2.5 MW and 4.5 MW wind turbines, and share its expertise in construction of wind parks. It will support RedWind in training the staff needed to produce and maintain wind turbines. Lagerwey will also supply components for the first 60 wind turbines.

IN BRIEF

Both Reactors at Kudankulam Reached Full Capacity

The both units of the Kudankulam Nuclear Power Plant constructed in India with Russia's input reached 100% of their design capacity and is sending 2,000 MW of electric power to the South Indian grid, a source in the Nuclear Power

Corporation of India Limited (NPCIL) told RIA Novosti. Kudankulam NPP is the largest example of the Russian-Indian economic partnership. Russia built and commissioned the first two units of the Indian nuclear power plant. In late June 2017, the first concrete was poured for the foundation slab of Kudankulam Unit 3, marking the beginning of the second construction phase (Unit 3 and Unit 4) at Kudankulam.