



## Rosatom 2016: New Records

**Russia's nuclear corporation demonstrated excellent performance across all lines of business, says Rosatom's Annual Report 2016, confirming continued growth of the revenue and international contract portfolio. You will find more details on the company's financial and operating performance in our report.**

In 2016, Rosatom increased its IFRS revenue by 5.3% to 864.6 billion rubles and retained its leadership in terms of reactor units under construction abroad (34 units in 12 countries). Long-term foreign contracts totaled 133.4 billion US dollars as at the year end. "We continued expanding our portfolio of international projects to have increased it by 20.9%. This is our undeniable achievement. One

of the key results was a contract signed with the Swedish nuclear operator for the supply of TVS-K nuclear fuel. Many years of our efforts to enter the Western nuclear fuel market were finally rewarded. Along with commercial fuel supplies to Sweden's Ringhals Nuclear Power Plant, we made a contract with an American company to deliver pilot TVS-K assemblies to the USA. There were other major achievements on the international market, such as a hand-over of Kudankulam's first two power units to India and the first concrete pouring at the site of Units 3 and 4. A groundbreaking ceremony was held in Iran to mark the start of construction of Bushehr II Units 2 and 3," Kirill Komarov, Rosatom's First Deputy CEO for International Business, commented on the last year's developments.

### **New business growth**

2016 saw the successful development of Rosatom's new businesses. The 10-year contract portfolio for new products went

up 74.6% to 1,018.8 billion rubles, while revenue from new products reached 190.8 billion rubles (+52.6%). Another key event from the last year was the company's winning bid to build 610 MW of wind generation capacity in Russia. "In 2016, our new products showed good performance. According to our strategy, new businesses will generate 30% of the Group's revenue by 2030. When we think of new products, we always look at whether they will be sought-after and competitive globally. Working on a new project, we always build a vertically integrated value chain so as to deliver a comprehensive solution to our international customers," Kirill Komarov noted.

## **Growing performance**

Consolidated labor productivity in current prices (excluding the Nuclear Weapons Division) has risen 110.9% against the 2011 base level Rosatom owes this growth to performance improvements as part of the corporate strategic program to reduce production costs and lead times. "In 2016, we cut our fixed costs by 8% and accelerated our inventory turnover by 27% (in days). We also launched an overhead cost optimization program that brought about 6 billion rubles in savings," said Nikolai Solomon, Rosatom's Chief Financial Officer and First Deputy CEO for Corporate Functions.

## **Onwards and upwards**

The annual report says that the year 2016 was record-setting as Russia's nuclear power plants generated 196.4 billion kWh of electricity, with the share of nuclear power reaching 18.3% of the country's energy mix. This was contributed to by the commissioning of Beloyarsk Unit 4 operating an innovative BN-800 fast neutron reactor and grid connection of Novovoronezh II Unit 1 with a Generation 3+ reactor (commissioned in February

2017). The report stresses that all nuclear power facilities worked safely and reliably in 2016, just like in the previous years, with no INES Level 2 events registered (Level 1 and Level 0 events pose no threat to the facilities, people or the environment).



*"We are not afraid of looking into the future because it is us who shape it. Our long-term Development Strategy 2030, which is a centerpiece of our 2016 Annual Report, totally proves it. Strategically, we aim to increase our share in foreign markets, create new products for the Russian and global markets, and reduce our production costs and lead times. 2016 was a success, and the Report shows that we made an important step to reach our strategic goals," Rosatom CEO Alexei Likhachev commented on the results.*

## **Rosatom: a career launcher**

In 2016, Rosatom won six major awards for its talent management practices. The company topped the annual Leadership Index ranking as the best Russian company for starting a career (the ranking is compiled annually by Rabota.ru recruitment website and Elitny Personal magazine). For the two consecutive years, HeadHunter named Rosatom a Top 3 Russian employer. The company was also ranked a Top 5 employer in the Engineering and Production category by Universum (based on the survey among engineering, physics and chemistry students).

The report was prepared in compliance with key global standards (International Framework, Sustainability Reporting Guidelines of the Global Reporting Initiative, and AccountAbility) and in close cooperation with stakeholders.





## Ambassadors Impressed by Russian Nuclear Technology

**Safety at Russian nuclear facilities is at the highest level. Forty two permanent representatives to the international organizations in Vienna visited Saint Petersburg to learn about Russia's advanced nuclear technology. They toured the Baltic Shipyard and Leningrad NPP II, now under construction, and were deeply impressed by what they saw. More details on the visit can be found in our report.**

Since 2013 Russia as an IAEA member and a member of the IAEA Board of Governors has organized annual visits of permanent reps to the United Nations in Vienna to Russian nuclear facilities. The goal is to present the latest nuclear technology developed in Russia.

The visits have long become regular, but this time, the fifth since 2013, the event attracted a record number of 42 high-profile visitors. Experts from Austria, Brazil, Hungary, Jordan, China, Panama, Peru, Singapore, Sudan, Thailand, Switzerland, South Africa and other countries were eager to see Rosatom's advanced technology. The diplomats praised the Russian openness and readiness to demonstrate reliability of the nuclear energy industry. This approach increased public awareness and trust to nuclear energy, the permanent representatives said.

The ambassadors visited the Baltic Shipyard where they inspected the Akademik Lomonosov floating power unit designed to supply power to the port of Pevek and industrial facilities on the Chukotka Peninsula, and a new generation nuclear icebreaker. They also visited the operating Leningrad Nuclear Power Plant and Leningrad NPP II (under construction in the town of Sosnovy Bor

near Saint Petersburg) featuring the world's second Generation 3+ reactor VVER-1200 to be brought online soon. The reactor complies with all post-Fukushima safety requirements.

## **Russian NPP are the world's safest**

According to Vladimir Voronkov, Russia's Permanent Representative in Vienna, the most important issue on the agenda of the visit was nuclear energy and its impact on the environment. "The Leningrad NPP is located in a pristine area near Saint Petersburg and clearly demonstrates that nuclear is a green energy. Our guests received exhaustive answers to their questions about safety and understand that Russian nuclear plants are arguably the safest in the world," he said.

The Leningrad Nuclear Power Plant demonstrates a high level of safety, believes Paulina Maria Francesco Navarro, Permanent Representative of Panama to the international organizations in Vienna. "We were shown how a nuclear plant operates and what investments are made in it. Based on what we have seen, I can confidently say that this nuclear plant is very safe, which is very important. I would also like to mention efforts to inform local communities and stakeholders. I think it important that Rosatom has embarked on the strategy of making the nuclear plant operation clear for the local community, for everyone who lives nearby," she said.

According to Karoly Dan, Hungary's Permanent Representative in Vienna, his attention during the visit was drawn mostly to the new VVER-1200 reactor constructed at Leningrad II. "We had an opportunity to see two different reactor types, and one of them is the same Hungary is going to build in the coming years. This is why I was particularly interested in VVER-1200, which is now under construction at Leningrad II," the ambassador said.

## **Benefits for the environment**

It was the third visit of Jordan's ambassador Hussam al-Husseini to the nuclear facilities operated by Rosatom. "Each visit is packed with impressions from technology and new solutions we are shown. Safety and relevant technical aspects were a centerpiece of this year's visit. Information provided to us convinced us that nuclear is safe in general and solutions offered by Rosatom are safe in particular." According to him, nuclear safety data received from Russian colleagues will be useful for public awareness programs in Jordan. "It will enable us to explain that nuclear technology can be beneficial for the environment," he added.

## **One-off project**

A strong impression on the ambassadors was made by Akademik Lomonosov, the world's first floating nuclear power plant. "It is a one-off project, the first ever floating plant. We are closely watching the project and want to see Russia's progress. It is a very interesting innovative project which will probably solve energy security issues in the future," said Tebogo Seokolo, South Africa's Permanent Representative to the IAEA and Chairman of the IAEA Board of Governors. Floating nuclear plants are interesting for Brazil, said Marcel Biato, Permanent Representative of that country in Vienna. According to him, Brazil faces difficulties in supplying power to the country's remote areas. "We pay much attention to the construction of the first floating nuclear plant; we are particularly interested in economic aspects of the project," he said. The project has "solved nuclear safety and security issues", he noted.

## **Newcomers impressed**

Russian expertise and advanced nuclear technologies are very impressive, says Fernando Rojas, Ambassador of Peru to

Vienna. “The visit was very informative and interesting. Since Peru is considering the prospects of developing a national nuclear power program, it is an excellent opportunity to learn as much as possible about peaceful uses of nuclear energy, nuclear power plants and safety systems. I am very much impressed with Russian expertise and technology.”

The Philippines also expresses interest to Rosatom’s technologies. Maria Zeneida Angara Collinson, the country’s Ambassador to the IAEA, noted that the Philippines were looking into the possibility of including nuclear power in the national energy program. “We have a

nuclear power plant in Bataan. Its construction was completed, but the plant has never been commissioned. Our growing economy needs more energy, and we study the use of nuclear in different countries, including Russia. Russia has the right technology and high safety standards.”

“Rosatom’s technology is one of the most reliable in the world. It has proved to be reliable, trustworthy and safe, especially in recent years. I think that friendship between Jordan and Russia has always been an example of trust, and we can rely on it,” the Jordan Ambassador noted.

## CONSTRUCTION

### FNPP on the Homestretch

**The Baltic Shipyard is nearing the completion of the world’s first floating nuclear power plant.**

The Baltic Shipyard in Saint Petersburg is about to complete the construction of a power unit for Akademik Lomonosov, the world’s first floating nuclear power plant (FNPP). It is 96% complete, said Alexei Vladimirov, FNPP Project Manager at the Baltic Shipyard. The FNPP is designed to be operated in Russia’s Far North and Far East, particularly as a source of power for the Chukotka Peninsula.

“Construction of the floating power unit is in its final phase. Technically, it is about 96% complete. All the systems and machinery have been installed, and we plan to finish the construction by 30 November 2017,” Vladimirov said. RosEnergoAtom, Rosatom’s subsidiary and FNPP project owner, plans to connect the unit to Chukotka’s grid in December 2019.



The FNPP is a totally autonomous power unit that can be transported to any part of the world. The capacity of the plant will be sufficient to sustain life in a city of 100,000 people. Having two KLT-40S reactors, the floating power unit is based on the design of a nuclear icebreaker reactor, the reliability of which was proven in long-time operation in the Arctic region. Unlike an icebreaker, the FNPP is not self-propelled. The facility is constructed in the shipyard to be towed by sea or river vessels to its place of operation. After arrival, it is connected to local infrastructure to supply electricity and heat to communities and production sites. According to the designers, the FNPP has been developed with high safety margins enabling it to withstand

extreme weather conditions and is fully compliant with the IAEA safety standards.

The FNPP has a 40-year service life divided into three 12-year operating cycles. After each cycle, the floating power unit will be transported to a special dock for intermediate maintenance and nuclear fuel reloading.

Rosatom expects to promote the project on the global market. FNPP designers believe that floating nuclear plants will be adaptable to any climate and fully customizable, including optional installation of desalination equipment, which is crucial for countries in dire need of fresh water.

At present, Rosatom Group companies are heavily engaged in the development of an improved floating power unit. The project leverages expertise gained in the

construction of Akademik Lomonosov yet includes several changes. The improved unit will have two RITM- 200M reactors, which are now the world's latest and most compact reactors, with a total capacity of 100 MWe. The new solution provides for a 30% increase in capacity, a 50% reduction of the containment area and a 30% decrease in the reactor weight. In general, the above changes reduce vessel dimensions. Specifically, they cut its length by 30 meters and width by 5 meters, with water displacement reduced by 9.000 tons and capacity increased 3.7-fold. The concept design and workflow philosophy of the new floating unit have been already developed. Rosatom's sub-sidiary AEM is about to start preliminary negotiations with prospective customers.

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## IN BRIEF

### **Rosatom held the first Festival of Science in Chennai (India)**

Chennai is the venue of the first Festival of Science (July 20 – July 27, 2017) as a series of nuclear science and technology educational events organized by Rosatom and JSC ASE EC with collaboration of the Russian Center of Science and Culture in Chennai (India). Andrey Lebedev, Vice-President for the South Asia Projects of ASE Group of Companies (as part of Rosatom), pointed out that: "The Festival of Science will first of all promote development of international relations rather than facilitate the public access to the site of scientific knowledge or be a tool of generating ideas for the future. Kudankulam NPP is a symbol of the Russian-Indian relations in the nuclear power. It is our hope that the Russian-Indian cooperation will see the successful progress in future and the Festival will

help to answer participants' topical nuclear questions."

"The Festival is to enable the participants to learn how nuclear technologies raise the human living standards, they will learn about up-to-date methods of their use and their role in the national growth", Alexey Pimenov, Regional Vice-President "ROSATOM – South Asia" added.

### **Priargunsky to Resume Uranium Mining at Facility Mothballed 15 Years Ago**

The Priargunsky Mining and Chemical Plant mines uranium at Mines 1 and 8 and extracts it by in-situ leaching at Mine 4. The plant also uses heap leaching in developing residual reserves of the Tulukuy quarry and dumping grounds out of use. Mine 6 has been out of operation for 15 years. Its construction was started in the 1980s, but suspended in 1991.



In 2005, Priargunsky resumed the mine construction and built a draw-works unit, an elevator facility and administrative premises. Everything was ready to pump water out of the shafts. The mine is currently mothballed, but operations can be resumed anytime after water is pumped out. The Mine 6 development project is supervised by the government of

Zabaikalsky Krai. Regional authorities stay in close contact with the federal government in solving issues related to financing the project and looking for investors.