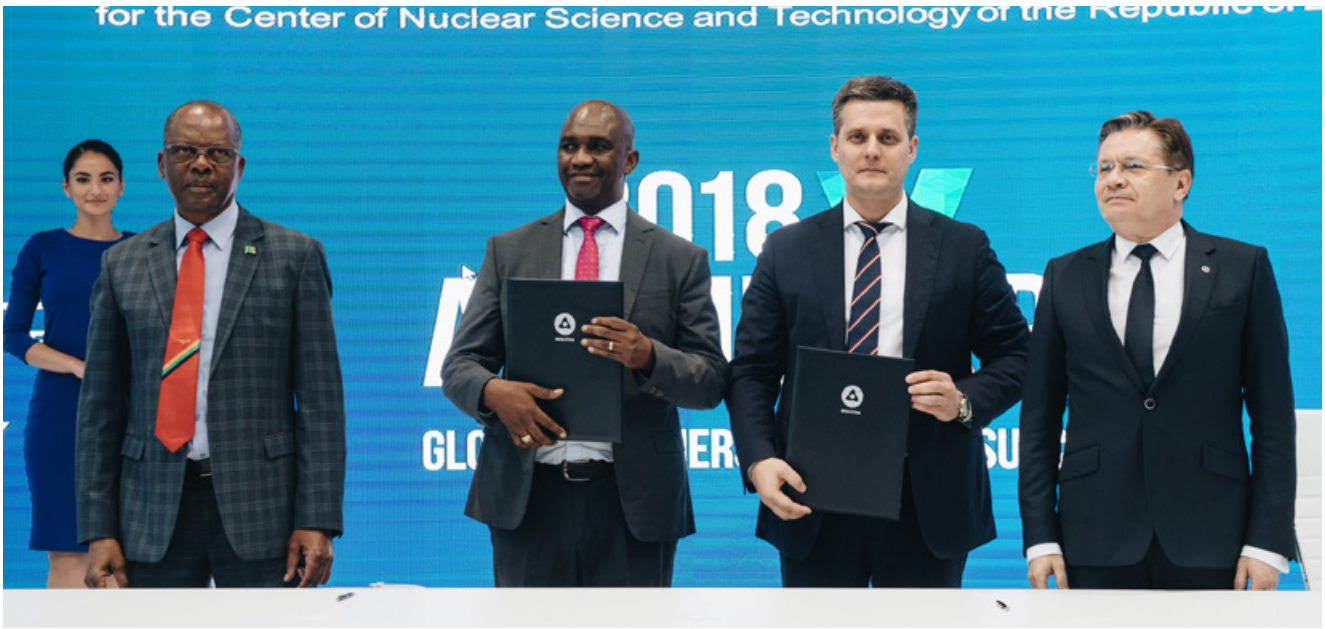
ROSATOM NEWS



Nuclear Center for Zambia

A general contract for the construction of a Centre for Nuclear Science and Technology (CNST) in Zambia was signed during the X international Forum ATOMEXPO-2018 in Sochi. Rosatom is to build the facility within six years from the work commencement date.

On behalf of Russian side, the document was signed by Director General of State Specialized Design Institute JSC (GSPI) Vyacheslav Galushkov, on behalf of Zambian side — by Permanent Secretary of the Ministry of Higher Education of the Republic of Zambia Mabvuto Sakala. Director General of ROSATOM Alexey Likhachev and the Minister of Energy of the Republic of Zambia Mathew Nkhuwa were present in the signing ceremony.

«The CNST will be located 10 kilometers away from the capital of Zambia, Lusaka.

For reference:

Research reactors are utilized for the development of scientific innovation and education in more than 50 countries. Currently, there are 245 working research reactors around the world with 58 units operated in Russia. Rosatom has built more than 120 research reactors in Russia and abroad. In September 2017, Russian State Atomic Corporation signed a contract for the construction of Nuclear Science and Technology Center with Bolivian government.

It will include a nuclear research facility based on a multipurpose research water-cooled reactor of up to 10 MW, a state of the art laboratory complex, a multipurpose irradiation center as well as a cyclotron-based nuclear medicine center»,— Rosatom states.

The Center's radiation technologies will be mainly applied in three areas. Healthcare is the first one. CNST-produced isotopes will be used for diagnosing and treating primarily

cancer and cardiac diseases. The use of radiation in agriculture will improve food safety and create conditions for the increase of Zambian agricultural exports. The CNST will also promote the development of national education and science through the training of highly qualified experts in various fields.

Irradiation to boost economy

Rusatom Healthcare (RHC), a Rosatom subsidiary, signed four agreements on irradiation center project development in Brazil, Iran and Malaysia.

The Project Development Agreement (PDA) for the joint implementation and operation of an Irradiation Center in Brazil was signed with CK3 company.

”The PDA sets the roadmap of the formation of a joint company aimed to offer irradiation services to the Brazilian market. The joint venture will use Russian technologies based on electron accelerators and x-rays for sterilization of pharmaceuticals, cosmetics and healthcare products and other industrial applications”,Rosatom reports.

According to RHC’s CEO Denis Cherednichenko, the Russian party sees potential in the Brazilian market in the field of medical product sterilization by radiation. “ The use of radiation technologies in the Brazilian healthcare sector can significantly improve the safety and quality of goods and services. Hermetically packaged medical products can be effectively sterilized, which reduces the risk of contamination in the production phase. Products treated with the radiation sterilization method will also increase the export potential of Brazilian companies engaged in the production of medical goods,” he said.

For reference:

Rusatom Healthcare JSC was established as a Rosatom subsidiary for development and production of equipment and radionuclide products for nuclear medicine and medical radiology, as well as industrial equipment and sterilization solutions for processing different types of products with ionizing radiation on the basis of electron-beam and gamma-ray installations.

In Iran, RHC is teaming up with «Shar Parto Iranian» to create a network of irradiation centers. According to the agreement, they will establish a joint engineering company, which will build a network of irradiation centers in the country. The facilities, equipped with electron accelerators and gamma ray units, will be used to provide commercial services to sterilize pharmaceutical, cosmetic and medical products, as well as food products.

RHC’s Malaysian partner is Beta Gamma Malaysia (BGM). The Project Development Agreement signed with this company is also

aimed at the construction of an irradiation center network. According to the document, both parties are to elaborate a joint action plan. The first phase of the first Malaysian irradiation center will contain electron beam radiation processing facility. Its main focus will be on contract sterilization for high-value medical devices and fruits for export.

“The irradiation center will give Malaysia an opportunity to create even more prosperous, safe and sustainable future for all, as these technologies will bring great changes to our social and economic environment. It will contribute to development of medical, industrial and agricultural spheres of Malaysia, thus drastically improving the quality of life,” Dr. Zulkafli Ghazali, Chairman of BGM said.

The fourth agreement was signed with A Brown Company Inc. (Republic of the Philippines). According to it, the parties will build a network of irradiation centres in the Philippines. «The pilot project, to be built in the City of Davao, will provide commercial services of product treatment with ionizing radiation. It may also serve as a sterilization platform for medical devices», - Rosatom reports.

The document signed outlines certain stages of the project development, from feasibility studies to construction and commissioning. NL

Sudan prepares to go nuclear

Rosatom and the Ministry of Water Resources, Irrigation and Electric Power of the Republic of the Sudan have signed two memoranda

The first document covers personnel training in the field of nuclear energy. The second one refers to the formation of positive public opinion on nuclear energy in the Republic of Sudan.

For reference:

In December, 2017 Ministry of Water Resources, Irrigation and Electricity of the Republic of the Sudan and Rusatom Overseas JSC have signed a Project Development Agreement (PDA) for the construction of a floating nuclear power plant in Sudan. According to the PDA, the parties will explore the possibility of constructing a floating NPP in Sudan.

«As part of the Memorandum on cooperation in personnel training the parties agreed on the implementation of joint projects in the field of personnel education and training for the needs of nuclear energy and related industries. It is planned to organize training programs for the nuclear infrastructure of the Republic; development of close cooperation between specialized educational institutions; organization of internships, summer schools, seminars, olympiads, conferences and round tables on nuclear topics; instructor training for the purpose of conducting courses in Sudanese universities and other educational organizations of the country; development

of field-specific educational and scientific literature and exchange of students,» Rosatom said.

The Memorandum on the positive public opinion formation mentions the plans to develop public information programs about nuclear technologies and their application spheres. It also includes intentions in the organization of educational events for the media and public opinion leaders, as well as the development of information and training materials aimed at drawing public attention to social and economic benefits of nuclear projects.

Rosatom to train Finnish personnel

Rosatom's subsidiary – Rusatom Service JSC – signed two trilateral Memoranda of understanding on cooperation in the field of nuclear infrastructure and personnel training.

The first document was signed with VTT Technical Research Centre of Finland Ltd. and Saanio&Riekkola Oy. «The main goal behind the signing was to broaden the cooperation in the sphere of nuclear education and personnel training, which Rusatom Service JSC is partly responsible for,» - Rosatom states. Cooperation in research is also mentioned in the Memorandum.

Rusatom Service's partners in the second document are JSC "VPO ZAES" and DEKRA Finland Oy. They agreed to cooperate in the development of education and personnel training for procurement and equipment quality control.

For reference:

Rusatom Service JSC was founded in 2011 as a member of the "Electric Power" division of Rosatom. The company provides a full range of services and supplies required for maintenance and repair for the foreign nuclear power plants that operate VVER-type reactors. The company has been present in 15 countries and services 22 of 37 existing NPP with VVER reactors outside Russia.

Atomenergomash digitalization

Atomenergomash JSC (AEM), Rosatom's mechanical engineering division, and General Electric (GE) signed a Memorandum of Understanding on the implementation of digital technologies in manufacturing.

The parties agreed to develop strategic cooperation in the area to increase production efficiency, optimize the technological processes and reduce costs of manufacturing at Atomenergomash plants. AEM and GE will make the current evaluation

of digitalization at the manufacturing premises of Rosatom mechanical engineering division. They will study the opportunities to utilize additional digital solutions through all production phases and develop a road map for digital transformation. The pilot project will be executed at Atommash in Volgodonsk.

«We are keen to apply different digital solutions in the environment and production management sector. It allows us to reduce decision-making time, to optimize machinery fleet loading, to propose new technical and product solutions for our clients, which is very important in the framework of a fast-growing order portfolio and manufacturing volume, » AEM Chief Executive Officer Andrey Nikipelov said.

«We are pleased to have an opportunity to extend our digital cooperation with Atomenergomash, one of the Russian mechanical engineering industry leaders. Modern digital technologies allow for a qualitatively new efficiency level," said Chief Innovation Officer GE Power Maher Chebbo.

For reference:

Atomenergomash is the power engineering division of Rosatom and one of the leading power engineering companies in Russia. It supplies effective integrated solutions for nuclear, thermal power, gas and petrochemical industries. The company is an association of about 30 big industrial, R&D and engineering businesses located both in Russia and in foreign countries.

Rosatom brings Wild Edens

The premiere of a new documentary Wild Edens: Russia the first in a new series that highlights the issue of climate change, took place in Sochi, Russia. Brought by Rosatom, it will be broadcast by National Geographic starting this summer.

Focusing on the flora and fauna in the one-of-a-kind natural habitats of Russia, the programme highlights the unique and delicate habitat of the Altai Mountains, the Kamchatka Peninsula, and the Arctic.

Filmed over 12 months, the 1 x 60 documentary, an Off The Fence production, will air across multiple markets in Africa, Asia, Latin America, the Middle East and Europe.

"We want to draw the public's attention to the global warming crisis and showcase the detrimental impact that mounting CO2 emissions generated by carbon energy sources are having on our planet", - Rosatom Director General Alexey Likhachev said.

Executive producer, Off The Fence productions Ellen Windemuth, said: «Russia is such a vast and elusive land that we relished the opportunity as film makers to capture the unique footage of this incredible region. This documentary helps viewers to discover Russian's rich natural wealth and catalogue it before this fragile paradise is negatively and possibly irrevocably impacted by climate change".

Erasing Borders

The 10th International Forum ATOMEXPO 2018, which was held under the motto 'Global Partnership for Joint Success', came to an end. The same name theme was central to the main plenary session that featured addresses of global nuclear industry leaders. Here are the highlights of ideas voiced at the event.

Alexei Likhachev
Rosatom Director General

— The global nuclear industry is influenced by three overarching factors – increased environmental awareness, digital transformation, and a politically and economically multi-polar world. We should take these trends into account.

According to the World Nuclear Association (WNA), we will have to commission 20 GW of new capacity on the annual average (10 GW annually in the near future and 35 GW at peak – RN). Commissioning new capacity on this scale is not a feat or a breakthrough but a conveyor, and should become customary. This is a huge challenge for Rosatom and the global nuclear industry.

New alliances – in nuclear procurement, interaction between contractors, project owners and governments and, of course, in science – have taken shape over the last decade. Rosatom is open to cooperation with any countries or companies, whether major global players, public organizations or small innovative businesses.

Mohamed Shaker
Minister of Electricity and Renewable Energy, Egypt

— Renewable sources of energy are our top priorities. We plan to increase the share of renewable energy to 20% of our energy mix by 2022, 37% by 2035, and 50% by 2050.

TRENDS

Electricity is key to national security, and we will continue supporting every green energy project.

Construction of a Russian-designed nuclear power plant will make Egypt a meaningful player on the energy export market. The plans are to supply energy to Sudan and Saudi Arabia. We also keep working on expanding our grid capacity. By the end of 2019, we plan to increase the length of our high voltage grids three times as compared to 2014 (when the new government came to power in Egypt – RN).

Necati Yamaç
Deputy Undersecretary of Ministry of Energy and Natural Resources, Turkey

— The Turkish economy grows 5% on the annual average, with population growing 2%. The country depends on imported energy – about 72% of electricity is supplied from abroad. This costs approximately 55 billion US dollars a year. The Akkuyu nuclear power plant will therefore strengthen the country's energy security.

We also plan to build the world's largest solar park with an installed capacity of 1,000 megawatts and have almost completed the engineering part of a wind farm project. However, renewable energy is not an alternative, but rather a supplement to nuclear power. We plan that the nuclear station will account for 10% of the national energy mix by 2023.

Hortensia Jiménez Rivera
Director General of Bolivian Agency for Nuclear Energy (ABEN)

— Until recently, Bolivia was lagging behind other countries of its continent. The political and cultural situation changed dramatically in 2005 (when Evo Morales Ayma was elected President of Bolivia and became the first Latin American president from an indigenous community – RN). The Government took an absolutely new approach to managing the country and its economy. Since then, science and education have played a much larger role than ever before.

No sovereignty is possible with technological development. We cannot be free without science and knowledge. The way we chose to develop our nuclear project (Rosatom will build a nuclear science and technology center in Bolivia – RN) implies technology internalization rather than just acquisition, participation in educational programs, and much more. We are interested in cooperation with countries like Russia, which is a leader in nuclear technology and views science as an important element of a sovereign state.

Vladimir Semashko
Deputy Prime Minister, Belarus

— As soon as we started building a nuclear power plant in Belarus (with Russia's input – RN), the Government made its position clear – it should be an advanced and reliable power plant that meets the strictest international safety standards. In 2016, the construction site was visited by IAEA Director General Yukiya Amano who noted that the Belarus NPP was one of the most successful projects in emerging nuclear countries. In March 2018, EU experts came to the country

to verify the results of nuclear safety stress tests. Their next visit is scheduled for June (the peer review report will be published in July – RN). Openness and transparency serve public interests and improve global safety culture.

William D. Magwood, IV
Director General of OECD Nuclear Energy Agency

— Different countries have different drivers behind the development of their national nuclear industries. Countries like Bolivia aim at acquiring advanced technology from other countries. China and the like target capacity expansion. Others, predominantly developed countries, are more concerned about environmental issues, particularly global warming, than access to electricity. In other words, each country benefits from nuclear technology in its own way. But the choice they make is relevant to us all.

Just a few countries are capable of building a nuclear power plant without engaging other countries. Russia, for example, engages multiple suppliers from those countries where it constructs nuclear plants. Nuclear can be said to have erased national borders and turned into a global industry. We all work together to create a single playground for decision making. Each country should take into account the global context while achieving goals on the national scale and have reliable partners and technology to maintain safety in the world.

BANGLADESH

Increasing power generation

Government of Bangladesh set an aim to build 60,000 MW of electricity generation capacity in order to become a developed country by 2041, local media report.

According to state minister of Power, Energy and Mineral Resources Nasrul Hamid, current power generation capacity of the country has reached 16,046 MW, and by 2021 it is to reach 24,000 MW allowing Bangladesh to become a middle income country.

The statement was made at the 'Rising Bangladesh' conference at Loeb House of Harvard University in Boston (USA).

Nasrul Hamid also told that Bangladeshi Power System Master Plan-2018 sets the following generation mix: 35% - natural gas, 35% - coal, renewable energy import – 10%, nuclear and other sources – 20%.

"The government encouraged private investment in the power and energy sector and meanwhile 50 % of electricity is generated from private sector. Initiative has been taken to handover a proportion of distribution and transmission line of power under private sector", - minister said.

Rostekhnadzor to consult Bangladesh

Bangladesh government committee on Public Purhase approved the proposal to appoint Russian state regulatory Rostekhnadzor as security and supervision consultant of the Rooppur NPP project, local media report.

The proposal came from the Science and Technology Ministry of Bangladesh. According to the document Rostekhnadzor will provide consulting services for 11 years. The cost of agreement is 13,54 Taka (160,19 mln. USD). The committee was chaired by finance minister, AMA Muhith.

Rostekhnadzor (Federal Environmental, Industrial and Nuclear Supervision Service) is a federal executive body exercising functions of elaboration and implementation of the state policy and regulatory/legal control in the established sphere of activities, and in the sphere of industrial and nuclear supervision, functions of control and supervision in the sphere of safe conduct of work connected with the use of subsoil, industrial safety, safety in atomic energy uses (except activities on development, manufacture, testing, operation and disposal of nuclear weapon and military nuclear power installations), safety of electrical and thermal installations and networks (except household installations and networks), safety of hydraulic engineering structures (except navigable hydraulic engineering structures and those under supervision of institutions of local government), safety of production, storage and application of industrial explosives, and special functions in the field of state safety in the aforementioned sphere. NL

For reference:

The first nuclear power plant in Bangladesh is based on the same design that is used for Novovoronezh II in Russia and will have VVER-1200 reactors. This Generation III+ design is fully compliant with international safety standards. The Rooppur project follows the defense-in-depth concept that provides for multiple defense levels and mitigation of accidents and human error, thus securing environmental safety. The containment of Russian reactors is able to withstand severe natural disasters, which is extremely important for a country facing regular hurricanes and floods.