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All This Is WAW

In late September, Moscow hosted the World Atomic Week (WAW), an international forum that brought together politicians, industry and public organization leaders, scientists, and journalists from around the globe. A major focus was placed on youth and promoting the Russian nuclear industry. Here's a look at the key events of the forum.

The forum, celebrating the 80th anniversary of the Russian nuclear industry, drew over 20,000 participants from 118 countries. Two days were dedicated to the business agenda, including high-level meetings, agreement signings, and in-person networking. An equal number of days was filled with the youth program events, featuring presentations for students and schoolchildren by nuclear industry leaders, opinion leaders, scientists, and experts.

The business program was kicked off by Russian President Vladimir Putin, who said: "More and more countries and major corporations are recognizing peaceful nuclear energy as a critical resource for long-term, accelerated development. It is evident that there are fundamental reasons for this paradigm shift. It is not just about reliable solutions — something else is important: a new energy system is emerging." No other country but Russia today possesses the expertise across the entire nuclear technology chain, he emphasized. Russian-designed nuclear power plants are the most sought-after in the world.

All participants in that day's roundtable discussion spoke about the benefits of cooperating with Russia. For instance, Belarusian President Alexander Lukashenko remarked: "We have built the most advanced and most beautiful nuclear power plant." Myanmar's Acting President Min Aung Hlaing discussed joint plans with Rosatom to construct a nuclear generating station in his country, a project the two parties have been working on since 2022. Armenian Prime Minister Nikol Pashinyan outlined the prospects for upgrading the Armenian Nuclear Power Plant, which was built by Soviet nuclear engineers. Niger's Minister of Mines, Ousmane Abarchi, proposed the idea of "nuclear dividends," implying benefits for all parties involved in the nuclear industry. He also invited Rosatom to participate in uranium exploration and production and to build two nuclear power units with a combined capacity of 2 GW. This was one of the major announcements at WAW. Ethiopian Prime Minister Abiy Ahmed shared that his country would like to create a model program, transparent and safe, for developing nuclear energy.

The impending shortage of natural uranium was another major topic at the forum. To address this issue, Rosatom proposed a closed nuclear fuel cycle concept. This involves recycling fuel multiple times using fast-neutron reactors, which would allow for a more complete utilization of energy contained in natural uranium and reduce the amount of radioactive waste.

"Nuclear fuel can be recycled again and again. Russia is undoubtedly a pioneer in this field. I believe

that in the coming decade, we will see many countries begin to view spent nuclear fuel as a valuable resource," said Sama Bilbao y León, Director General of the World Nuclear Association (WNA), during a press briefing.

As part of the forum, the BRICS Nuclear Energy Platform held its annual conference to sign the first strategic document — a vision statement outlining the primary areas of focus. These include workforce development, securing financing for nuclear energy projects, creating sustainable supply chains, promoting reactor construction and nuclear fuel cycle technologies, building public acceptance of nuclear energy, and more.

Signed at WAW

Rosatom and its subsidiaries signed nearly fifty agreements during the World Atomic Week. Here are some of the most significant deals with international partners.

On the eve of the forum, Rosatom Director General Alexey Likhachev and Iran's Vice President and President of the Atomic Energy Organization of Iran, Mohammad Eslami, signed a memorandum of understanding and cooperation in the construction of small modular reactors in Iran. The document outlines concrete steps to implement the project.

Rosatom Director General Alexey Likhachev and Ethiopian Electric Power CEO Ashebir Balcha signed an action plan for a nuclear power plant project in Ethiopia. Signed in the presence of Russian President Vladimir Putin and Ethiopian Prime Minister Abiy Ahmed, the plan provides for establishing a working group, drafting a roadmap and an intergovernmental agreement, and supporting nuclear infrastructure.

A series of documents was signed with Uzbekistan concerning the construction of the world's first nuclear generation facility to comprise two VVER-1000 reactors and two 55 MW RITM-200 reactors, and supplying fuel for it.

Rosatom Overseas Generation and Vietnam's Power Engineering Consulting Joint Stock Company 2 (PECC2) signed a memorandum of understanding that lays the groundwork for cooperation on the Ninh Thuan 1 Nuclear Power Plant project in Vietnam.

The Belarusian Nuclear Power Plant and TENEX (part of Rosatom) signed a spent fuel management contract.

An agreement between the Cabinet of Ministers of the Kyrgyz Republic, Rosatom's Fuel Division, Energy Solutions Kyrgyzstan (Rosatom's country office), and the construction company Elbrus is focused on setting up local production of lithium-ion batteries in Kyrgyzstan.

Rosatom's Fuel Division (TVEL) and the Beijing Research Institute of Uranium Geology (BRIUG) signed an agreement on TVEL's accession to the MonEH project. Russian researchers will gain access to field studies in the Beishan underground laboratory for the safe disposal of high-level radioactive waste.

Medscan Group and Russian-Arab Business House LLC agreed to develop medical tourism with a full range of medical services to be offered in Russia to patients from Middle Eastern countries.

A memorandum signed between the cities of Zarechny (Sverdlovsk Region, Russia) and Dunaföldvár (Hungary) supported international humanitarian ties.

The Rosatom Technical Academy and Yangon Technological University (Myanmar) signed a memorandum to train personnel and develop scientific research.

Nuclear: A Field for the Young

Young researchers, engineers, students, and even schoolchildren were full-fledged participants in the World Atomic Week. Young fusion physicists, for example, proudly spoke of their involvement in the International Thermonuclear Experimental Reactor (ITER) project to build the world's first operating fusion reactor. Schoolchildren took part in a robotics festival. The biggest attraction was a robotic actress crow that plays cameo roles in theatrical performances.

The need to train professional staff for the industry was discussed at every level, including by heads of state and government agencies, at the BRICS

Platform conference, in thematic sessions, and in presentations by university leaders. Discussions covered the importance of interdisciplinary education, the necessity of practical skills, and the benefits that a 'nuclear' education brings to a country as it builds a technically educated elite over time.

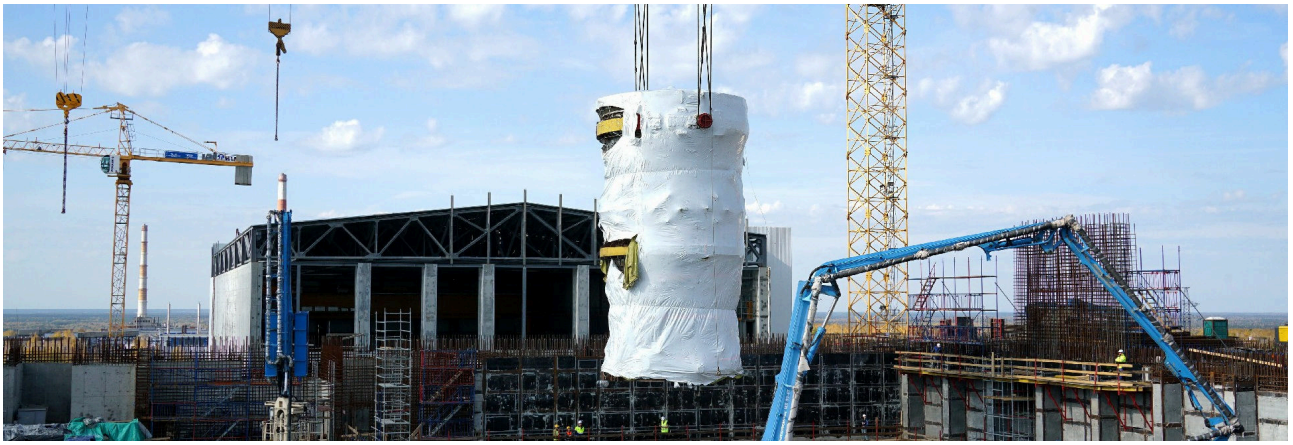
On the final day of the World Atomic Week, the Grand Finale of the international student championship Global HackAtom was held, with over 50 winners of national rounds from Russia and nine partner countries participating. The final was dedicated to nuclear-powered space exploration. Teams presented projects on interplanetary travel, the first space-based nuclear power plant, and the Silk Road 2100 in space.

The winning team was TUPI Tech from Brazil. They presented an innovative project for a modular space nuclear reactor capable of producing resources for interplanetary travel. Second place went to the Tahu Sumedang team from Indonesia, which proposed using nuclear technology to regulate circadian rhythms (biological process fluctuations) during interplanetary missions. Third place was awarded to the IsotopeX team from Hungary for their idea of a nuclear power source for a device that monitors fluid retention and vital signs of a sleeping person during space travel.

Photo by: Wikipedia, Leningrad NPP, *Strana Rosatom* newspaper

Approaching Breakthrough

The Proryv (Russian for breakthrough) Project has taken a couple more steps closer to its goals. Key components for the primary circuit of the BREST-OD-300 reactor have been delivered to the construction site of an experimental power generation facility (abbreviated ODEK in Russian) in Seversk, Tomsk Region. Besides, an analytical laboratory was commissioned at the fuel fabrication/refabrication module, which is also part of ODEK.



In September, key components for the 300 MW BREST-OD-300 demonstration lead-cooled fast reactor were delivered to the ODEK construction site at the Siberian Chemical Plant. These include a steel casing for the reactor's central cavity, an inner shell for the core basket, and the first of the peripheral cavity casings. There are four such casings in total. All these components were manufactured at the production facilities of Rosatom's Mechanical Engineering Division.

It needs to be explained that the design of BREST-OD-300 differs from that of traditional light-water reactors. While a light-water reactor is, very basically, a steel barrel, the BREST-OD-300 is a complex steel-and-concrete system with multiple cavities. The core basket will be housed in the main cavity, where the fuel assemblies will operate and the chain reaction will occur. The four peripheral casings will contain the main circulation pump, two steam generators, and the emergency core cooling system heat exchanger. The space between these cavities will be gradually filled with concrete during construction.

The dimensions of the BREST-OD-300 reactor vessel are larger than that of a light-water reactor, so it can only be delivered to the site in sections. The reactor will be assembled on-site. It took two months to transport the components along Russian rivers and via the Northern Sea Route. At the port of Samus on the Tom River, they were loaded onto a multi-axle platform and hauled to the construction site by special tractors. To allow them to pass, power lines had to be temporarily raised and road signs taken down.

"This year, the main components of the BREST-OD-300 reactor will be placed in their design position, and the reactor will take shape, with concrete walls erected and a steel vessel installed," promised Konstantin Izmestiev, CTO at the Siberian Chemical Plant. Installation began in September, and the structure is set to be in its design position by the end of this year.

By late September, the steel casing for the reactor's central cavity was put in place as designed. The next stage is the installation of four peripheral cavity casings.

Laboratory-level precision

An analytical laboratory has been commissioned at the ODEK's fuel fabrication/refabrication module. It is equipped with about 90 high-tech devices needed to conduct analyses and verify that the mixed

uranium-plutonium nitride (MUPN) fuel, which will be produced at the module, meets established technological criteria and safety requirements.

The pride of the laboratory is its three solid-phase mass spectrometers, which measure key parameters of nuclear fuel (isotopic composition, and mass fractions of uranium and plutonium), and its inductively coupled plasma optical emission spectrometers in a box-type design. They can simultaneously detect around 17 metallic impurities with precision down to parts per million.

“The lab at the fab/refab module is the first ever to analyze mixed uranium-plutonium nitride fuel, which has never been produced industrially anywhere in the world before. The chromatographic separation section, where samples for mass spectrometry are prepared and measurements are carried out continuously, is also one of its kind. In terms of the complexity of the tasks it solves, the laboratory in Seversk is actually the leader among all factory laboratories at the nuclear fuel fabrication sites,” said Mikhail Skupov, manager of the MUPN Fuel Rods and Fuel Assemblies consolidated project.

The Proryv Project is expected to take the global nuclear power industry to a new level. Its ultimate goal is to make the closed nuclear fuel cycle a viable technology, with fast neutron reactors and fuel reprocessing facilities located on the same site. It also aims to improve safety of nuclear generation, achieve a more complete utilization of energy contained in natural uranium, and reduce radioactive waste. ODEK belongs to Generation IV energy systems.

In addition to ODEK, Russia is also working on a project to construct a power unit with a 1,200 MW sodium-cooled fast reactor at the Beloyarsk Nuclear Power Plant.

Photo by: Rosatom State Corporation, SCP

Arktika Turns Five

This year, the Russian nuclear fleet operator Atomflot celebrates the fifth anniversary of raising the flag on the flagship multi-purpose nuclear-powered icebreaker Arktika. This vessel marked the beginning of a new era for the nuclear icebreaker fleet, small-scale nuclear power plants, and the Northern Sea Route.

The fact that Russia needs more nuclear icebreakers to complement its existing fleet was first conceived in the early 2000s. More powerful and more advanced nuclear vessels were needed to develop large Arctic deposits and escort commercial vessels exporting their products.

The technical design for the Arktika was developed by the Aisberg Central Design Bureau in 2009. The key difference from earlier designs was the use of the newest RITM-200 reactor unit with a thermal capacity of 175 MW. Scientists and engineers from OKBM Afrikantov developed it specifically for this icebreaker. The main feature of this reactor unit is its integral layout: the steam generators are housed in the same vessel as the reactor. Thanks to this solution, the RITM-200 is almost twice as light and compact as its predecessors, making the icebreaker more maneuverable and taking up less space on the vessel. As a result, its operation is more cost-effective.

The second feature of the Arktika is its dual draft capability: the icebreaker can change its draft and operate not only in Arctic seas but also in the mouths of rivers like the Yenisei and Ob. The third feature is its higher level of automation compared to predecessors. This reduced personnel requirements and simplified control of the reactor unit. Watch duty on the Arktika is now only maintained on the navigation bridge and central control post, with no watch stations at local posts. Engines and other mechanisms in the engine room — a huge four-level space — are monitored with instruments and through regular rounds.

Having the length of 173.3 m and draft of 10.5 m / 9.03 m, the Arktika icebreaker is capable of breaking through the ice of up to 3 m thick and needs refueling once every 7 years. Its designed service life is 40 years, and the crew consists of 54 people.

Arktika's cabins — sailors' home where they rest between watches during the voyages that might last several months — resemble cozy and comfortable hotel rooms. They have all the necessities, including a private bathroom with a shower, work area with a desk, TV, small refrigerator, sleeping area, relaxation couch, and storage space for personal belongings. A popular spot on the icebreaker is a large gym, where crew members can play indoor soccer, basketball, volleyball, and even hold table tennis tournaments. There is also a separate weight room for strength training enthusiasts. The icebreaker features a sauna, swimming pool, and tanning booth.

Construction and operation timeline

The decision to build the Arktika icebreaker was made in 2012. It was laid down in November 2013 and launched on June 16, 2016. The nuclear-powered vessel was named after the legendary icebreaker Arktika, which became the first-ever surface vessel to reach the North Pole (on August 17, 1977).

The ceremonial raising of the state flag on the new Arktika took place on October 21, 2020, in Murmansk. "The nuclear icebreaker fleet is a clear competitive advantage for Russia. And, of course, its expansion represents powerful investment in the future. Above all, it is an impulse for economic development of both Russia and the region," Russian Prime Minister Mikhail Mishustin said at the time.

On November 14, the icebreaker departed on its first working voyage and has since spent five years escorting ship convoys on the ice-covered Northern Sea Route, supporting Arctic projects. Since construction, Arktika has traveled 126,166 miles through ice and escorted 677 vessels (as of early October 2025).

Mass-produced reactors for icebreakers and small-scale generation

Arktika initiated the serial construction of Project 22220 icebreakers. The same-design icebreakers — Sibir, Ural, and Yakutia — are already operating on the Northern Sea Route. The first two entered service in 2022, the third in 2024. Another one, Chukotka, is nearing completion. Two more icebreakers of the same Project 22220 design will soon join the ranks: Leningrad is currently under construction, with preparations ongoing to lay the keel for Stalingrad.

Importantly, RITM-200 reactors are now mass-produced. Rosatom is confidently offering its customers small-scale nuclear power plants in both onshore and offshore versions, featuring modifications of these same reactors. Russian engineers have developed a more powerful reactor, RITM-400, with a thermal capacity of 315 MW, surpassing all existing marine reactors by a wide margin. Two such reactors will power the new Project 10510 icebreaker Rossiya. For their power, these reactors will even have their own names, Ilya Muromets and Dobrynya Nikitich, after the main characters of Russian epic poetry. The first RITM-400 was manufactured in May of this year, and the second in September.

Photo by: Baltic Shipyard, Atomflot, *Strana Rosatom* newspaper

Nuclear Plants Improve Performance

Over the past two months, the World Nuclear Association (WNA) has released two documents, the World Nuclear Performance Report tracking nuclear construction and energy output across the globe and the World Nuclear Fuel Report outlining three supply and demand scenarios and assessing the availability of uranium supplies through 2040. Both current performance and future projections show upward trends.

Nuclear stations: record-high output

The WNA identified record-high electricity generation at nuclear facilities worldwide as the main achievement of 2024, with 2,667 TWh produced, up from 2,601 TWh the previous year. This figure surpassed the previous record of 2,660 TWh set in 2006. Since 2012, North America has led the world in nuclear power generation. Europe, which held the top position in the first half of the 2000s and remained roughly on par with North America in the latter half of the 2000s and early 2010s, has now fallen to third place, overtaken by Asia as well. A 40 TWh increase in the European output in 2024 — driven by French reactors returning to service after temporary outages in 2022 and 2023 — was insufficient to reverse this trend.

2,667 TWh

Global nuclear energy output in 2024

Asia showed the largest growth in generation capacity and is now in second place in terms of output, closely approaching North America. In other regions, including Russia and Eastern Europe, nuclear energy output in 2024 remained virtually unchanged compared to 2023.

As of the end of 2024, there were 440 operational reactors worldwide with a combined electrical capacity of 398 GW — three reactors and 6 GW more than in 2023.

The report notes that in 2024, some reactors in Japan (19 GW), India (less than 1 GW), and other countries (11 GW) did not generate electricity because their operations are currently suspended. Thus, the total electrical capacity of reactors that actually produced electricity in 2024 was 369 GW, which is 1 GW more than the previous year.

Pressurized water reactors are the most numerous worldwide (313), with their number increased by five in 2024 compared to 2023. Boiling water reactors rank second (60), remaining unchanged from 2023. The number of heavy water reactors decreased by one to 46. Graphite-moderated reactors also declined by one, totaling 10 in 2024.

Historically, many reactors were commissioned in the 1970s and 1980s, while new construction slowed significantly in the 1990s and 2000s. In the 2010s, the pace of new additions began to rise again. Consequently, the global fleet now includes growing numbers of both 'young' (under 15 years old) and 'elderly' (over 42 years old) reactors. However, the core of the operational nuclear fleet still consists of mid-life units (15 to 42 years old). Notably, Rosatom is currently building power units with a design life of 60 years, extendable by another 20 years.

New construction in 2024

Last year, construction began on nine reactors, six in China and one each in Egypt, Pakistan, and Russia. In Russia, first concrete was poured for Unit 3 of Leningrad II on March 14. By September of this year, workers had installed the first tier of the reactor building's inner containment shell and begun preparations for the turbine building foundation.

As of the end of 2024, 63 units were under construction worldwide, including four in Russia: three with VVER reactors and one Generation IV fast neutron reactor.

Seven reactors were connected to the grid for the first time in 2024, three in China and one each in the United States, France, India, and the UAE. Construction timelines for these units varied significantly. The best result was achieved at Zhangzhou 1 (China), with only 61 months elapsed from first concrete pouring to grid connection. The longest construction period was for Flamanville 3 (France), which took 204 months. On average, the units connected in 2024 took 114 months — just under 10 years — to build. It should be noted that the construction start date for Unit 1 of the Shidao Bay Nuclear Power Plant had to be determined using satellite imagery, as no official announcement of first concrete pouring was made.

Construction of most units currently being built began within the last seven years. Only the prototype fast breeder reactor (PFBR) and Rajasthan 8 with a PHWR (both in India) have been under continuous construction for over 10 years. Other units with construction periods exceeding 10 years experienced, or are still experiencing, construction delays or suspensions.

Four reactors were permanently shut down in 2024: Pickering Units 1 and 4 (Canada), Maanshan Unit 1 (Taiwan), and Kursk Unit 2 in Russia. In summary: seven units were connected to the grid and four retired in 2024, resulting in a net positive balance.

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Intensive operation

Last year, the global average nuclear capacity factor — the ratio of actual output to maximum possible output — reached 83%, up 1% from the previous year. Africa showed the greatest improvement in the capacity factor. Both units of the continent's only operating nuclear plant, Koeberg, passed scheduled maintenance and retrofit one after another. Unit 1 was under maintenance from December 2022 to November 2023, and Unit 2 from December 2023 to December 30, 2024. The two units were overhauled ahead of a planned 20-year life extension.

Capacity factors remained flat in North America but declined slightly in other regions. "As observed in previous years, there is no overall age-related decline in nuclear reactor performance, in terms of average capacity factors achieved by reactors of different ages. This includes reactors that have operated for 40 years and longer, which is a positive indication for the potential of reactors to continue to function well when entering periods of extended operation," the report says.

Uranium supply: an open question

The future of the nuclear sector was further analyzed in the 22nd edition of the World Nuclear Fuel Report. It presents three scenarios for global nuclear power expansion, and all were revised upward compared to the 2023 projections.

According to the reference scenario, global installed nuclear capacity (398 GW as of June 2025) will grow to 746 GW by 2040 (60 GW higher than the 2023 forecast). In the upper scenario, capacity will reach 966 GW (35 GW higher), and 552 GW (66 GW higher) in the lower scenario.

Consequently, uranium demand will also rise. WNA experts estimate that nuclear power plants will need 68,920 tonnes of uranium in 2025. In the reference scenario, demand will grow to just over 150,000 tonnes by 2040; the upper scenario requires more than 204,000 tonnes, while the lower scenario still needs over 107,000 tonnes.

The key challenge is that uranium supply from primary sources (mines) does not cover projected demand, even when combined with supply from secondary sources. Mining companies face two major obstacles: insufficient investment and excessively long licensing timelines (8 to 15 years) for new uranium mines.

Speaking at the World Atomic Week in Moscow in late September, Sama Bilbao y León urged authorities to shorten these timelines to accelerate production at already identified but not yet operational mines. “Uranium is fortunately a resource that is quite abundant in all continents, but obviously we need to invest in the exploration of this resource and in the extraction. And related to that is to work together with regulators and the agencies that are permitting these mines to optimize and accelerate the process of permitting these mines,” she said at a press briefing.

She clarified her point: “Obviously, this does not mean cutting any corners. I mean we still need to make sure that we do due diligence and we make sure that we assess all the things that need to be assessed in order to permit the mine. But let’s do that in a very efficient manner.”

Photo by: *Strana Rosatom* newspaper

Armenia Engages in Nuclear Dialogue

Developing nuclear energy is one of Armenia's top priorities. This was stated by Prime Minister Nikol Pashinyan in his address at the World Atomic Week (WAW) international forum organized by Rosatom. Armenia's participation in the forum was also marked by the active involvement of young professionals and the country's women's community.

Prime Minister Nikol Pashinyan took part in the Global Nuclear Forum, one of the central events of the World Atomic Week. The discussion also featured Russian President Vladimir Putin, leaders of Belarus, Uzbekistan, Myanmar, Ethiopia, and Iran, IAEA Director General Rafael Grossi, heads of relevant ministries from partner countries, and representatives of international organizations. The session was moderated by Rosatom Director General Alexey Likhachev.

Discussions at the forum were focused, among other things, on the contribution of civil nuclear technology to the planet's long-term development. "Nuclear energy plays a vital role in ensuring reliable and sustainable power supply. It helps reduce carbon emissions and achieve low-carbon development goals," said Nikol Pashinyan, emphasizing that nuclear power would become a key component of a sustainable energy mix in the future.

Pashinyan recalled that around 30% of electricity in Armenia was generated by the Armenian Nuclear Power Plant (ANPP). "The Armenian government has adopted a policy to maintain the nuclear power plant as a cornerstone of the country's energy mix," the Prime Minister said. He stressed that adhering to the highest safety standards was an absolute priority. This is the approach that underpinned the plant's large-scale upgrade effort, enabling its operational life to be extended until 2026. Building on this experience, Armenia has decided to further extend the ANPP's operation through 2036. "The modernization and life extension program for the Armenian NPP is not merely a technical undertaking — it is a model of effective collaboration between the Republic of Armenia, Rosatom, and other international partners," Pashinyan pointed out.

The Prime Minister also congratulated the Russian nuclear industry on its 80th anniversary, calling it an important milestone in scientific and technological advancement and the result of commitment from brilliant professionals.

Bilateral cooperation was further discussed during Pashinyan's meeting with Vladimir Putin in the Kremlin. The Prime Minister noted that Yerevan was working with Rosatom across several areas, including exploring the potential for small modular reactor projects.

Youth Declaration on Nuclear Cooperation

Armenian representatives played a prominent role in the WAW youth agenda: they were among the authors of the first Youth Declaration on Nuclear Cooperation and presented the document to nuclear industry leaders and IAEA representatives. One of the speakers was Gagik Arutyunyan from Armenia, a member of Impact Team 2050 and project manager at the Yegvard Youth Environmental Organization.

A total of 100 young leaders from 33 countries, including nuclear professionals, scientists, healthcare experts, and representatives of international organizations, collaborated on the declaration. The document outlines seven core principles, ranging from nuclear safety to equal access to education and technology. It emphasizes that nuclear science must serve humanity by helping address global challenges in medicine, environment, and industry. According to its authors, the sector's future hinges on open international cooperation built on mutual trust and responsible use of technology.

Industry leadership endorsed the declaration and pledged support. "We will do everything we can to assist you in implementing your strategic goals and ensure this vision takes root across continents, countries, and individual projects. But none of this will matter unless your generation surpasses ours, becoming more knowledgeable, more professional, and more capable of cooperation. You must outpace us, and we will only be happy about that," said Rosatom Director General Alexey Likhachev.

Engagement in the women's agenda

Armenia was also an active contributor to the international review of best practices for supporting women in the nuclear industry. The review was presented at WAW 2025. Armenian representatives shared national experience for the document and took part in discussions with other participating countries and the IAEA. Speakers from Russia, Armenia, Kazakhstan, Uzbekistan, the Philippines, Morocco, and the IAEA exchanged approaches to expanding women's participation in the nuclear and related sectors.

The review was prepared by the International Council for the Support and Development of Women in Technology and Industry established on Rosatom's initiative, and features best practices from 16 countries, including Armenia as one of the Council's member states. Participants highlighted the initiative's importance for advancing the women's agenda in high-tech sectors. "Work on this document will continue on an annual basis, with new chapters added as more countries join," noted Tatyana Terentyeva, Deputy Director General for HR at Rosatom.

Photo by: Rosatom State Corporation, Rosatom Corporate Academy, primeminister.am

Egypt Joins Nuclear Power Club

The potential of nuclear power, the role of local companies in constructing the El Dabaa Nuclear Power Plant, strategic partnerships, and the future of nuclear medicine — these were just a few of the topics discussed by the Egyptian delegation at the World Atomic Week (WAW) international forum held in Moscow at the end of September. The forum demonstrated that the nuclear industry is a driver of comprehensive development across a wide range of sectors.

Speaking at the WAW opening ceremony, Egypt's Minister of Electricity and Renewable Energy, Mahmoud Mostafa Kamal Esmat, emphasized that the El Dabaa NPP project was being implemented under the umbrella of Egypt-Russia strategic partnership. According to the minister, the nuclear project reflects the depth of historical ties and strong connections between the two countries and their peoples. Mahmoud Mostafa Kamal Esmat highlighted the high level of coordination, cooperation, and interaction between the Egyptian and Russian teams.

This was followed by a ceremonial shipment of the reactor pressure vessels for Unit 4 of Türkiye's Akkuyu and Unit 1 of Egypt's El Dabaa. The truck convoys carrying the equipment departed from Russian factories, with the live coverage broadcast during WAW. The green light for the departure was given by Mahmoud Mostafa Kamal Esmat, Turkish Deputy Minister of Energy and Natural Resources Zafer Demircan, and Rosatom Director General Alexey Likhachev.

Prior to the ceremony, the reactor vessels were wrapped in decorative covers featuring quantum mechanical models of atoms stylized as traditional Russian "Khokhloma" folk painting.

The reactor for El Dabaa Unit 1 is the 80th such reactor exported by Russian manufacturers. Symbolically, it begins its journey to the installation site during the celebration of the 80th anniversary of the Russian nuclear industry. This reactor is scheduled to be installed in its final position as early as November of this year.

In addition to participating in the WAW business program, forum guests eagerly explored the exhibition dedicated to the El Dabaa project. They learned about key project milestones and also discovered Egyptian culture and traditions. Furthermore, the visitors had the chance to sample dishes from traditional Egyptian cuisine in the Nuclear Power Countries' Cuisines themed zone.

Local production and development

Building a nuclear power plant is not just one of the largest industrial projects for any country but also a critical catalyst for its economic growth and human capital development. Participants in the roundtable titled "Localizing the Global: Partnerships and National Content" discussed how collaboration among vendors, global partners, and local stakeholders delivers cutting-edge technological solutions. Increasing local content in international projects transforms the lives of thousands of people in the host country, who become involved in the project both directly and indirectly. Given that any nuclear plant operates for decades, these changes often impact multiple generations. However, overseas construction projects place special demands on vendors: they must fully align with the requirements of the customer country.

Sherif El Digaidi, NPP Project Manager at Egypt's Petrojet, noted that El Dabaa was the largest energy project in the country. A vast number of Egyptian

companies are involved in its delivery. Each local contractor undergoes certification according to Russian standards and is also certified by the Egyptian nuclear regulator. Being involved in the project, local companies acquire exclusive competencies and significantly improve the quality of their products.

Next-level medicine

Healthcare development, specifically the capabilities of nuclear medicine, was one of the key topics at the forum. During one of the sessions, delegates discussed the status and prospects of producing and using radiopharmaceuticals, as well as opportunities for institutional and international cooperation to expand the range of nuclear medicine services. Russian Deputy Health Minister Evgeny Kamkin noted that the range of diseases treated with nuclear medicine methods had significantly grown in recent decades, primarily encompassing oncology and cardiovascular diseases, as well as endocrine, neurological, and other conditions.

Ahmed El Sobky, Chairman of the Egypt Healthcare Authority, shared that Egypt aimed to develop its medical infrastructure and enhance early disease detection methods, including through nuclear medicine technologies. He emphasized the importance of cooperation with Russia, particularly within the upcoming project to establish mobile diagnostic infrastructure to improve access to early cancer screening.

Leaders of the nuclear future

On the final day of WAW, a closing ceremony was held for the second session of the [In]Visible Force international women's leadership program run by Rosatom's Corporate Academy. This year, the six-day educational intensive was completed by 27 young female professionals from the nuclear industry, representing 16 countries including Egypt, Algeria, Brazil, India, Kazakhstan, Kenya, China, Nigeria, Türkiye, South Africa, and European nations. They visited the world's first nuclear power plant and leading nuclear companies, and took part in group mentoring sessions and career development workshops.

Top-tier safety

As part of the forum program, a visit to the Kalinin NPP (Tver Region, Russia) was organized for Egyptian journalists within an international press tour that brought together 45 media representatives from eight countries — Vietnam, Egypt, Indonesia, Malaysia, Myanmar, Brazil, Türkiye, and Uzbekistan. The journalists visited Kalinin's Public Information Center, toured the Unit 3 control room and turbine hall, and received detailed briefings from the plant management on safety systems, electricity output, environmental monitoring activities, and the plant's contribution to the regional economy.

"Safety is the absolute priority in the design and operation of nuclear power facilities," said Ruslan Alyev, Chief Engineer at the Kalinin NPP. He noted that the plant's performance metrics confirmed the effectiveness of its safety culture principles: for over 40 years, the Kalinin NPP has operated reliably as part of the Russian national power grid. Ruslan Alyev added that Kalinin generated 82% of all electricity in the Tver Region and 14% of the electricity produced in the Central Federal District of Russia; it accounts for approximately 15% of total output by RosEnergoAtom (Rosatom's nuclear plant operator). This nuclear plant is also a major employer in its host community.

The press tour continued with a visit to the Kalinin Data Center. This high-tech facility, connected to a reliable source of power, provides secure and uninterrupted data services to hundreds of clients. The media representatives also visited the cooling pond located one kilometer from the nuclear plant. Radiation levels were measured in their presence: readings on land and at the water's edge remained well within permissible limits.

Photo by: *Strana Rosatom* newspaper, Kalinin NPP

First Nuclear Plant: A New Configuration

Rosatom and UzAtom signed documents at the World Atomic Week international forum to expand cooperation in the nuclear sector. The parties agreed on a new configuration for the nuclear power plant project in Uzbekistan.

The nuclear power plant will have two large power units equipped with Generation III+ VVER-1000 reactors (1,000 MW each), as well as two small power units with RITM-200N reactors (55 MW each). Rosatom and UzAtom also signed term sheets for the contracts to supply fuel for both the large and small nuclear reactors.

“We are launching an unprecedented energy project in the very heart of Uzbekistan, in the Jizzakh Region. We are not just building the region’s first nuclear power plant — we are pioneering an innovative solution for the future. Our project boldly combines cutting-edge small modular reactor technologies with time-tested large-scale nuclear energy solutions,” said Azim Akhmedkhadjaev, Director of UzAtom.

Speaking at the forum’s plenary session, Deputy Prime Minister of Uzbekistan Jamshid Khodjaev recalled that the country had extensive experience in nuclear industry development and produced over 3,500 tonnes of uranium annually. “For us, this project is not just a step toward energy independence but also a model of strategic cooperation with Russia. Thanks to Rosatom’s expertise and technologies, we can build our nuclear plant to a design that has no counterpart in the region. This is another opportunity for our Russian partners to demonstrate the effectiveness of their solutions in practice and lay the groundwork for joint manufacturing, workforce training, and scientific research. This nuclear power plant will become a symbol of Uzbekistan’s new industrialization and a solid foundation for strategic partnership between our countries for decades to come,” Khodjaev affirmed.

Small nuclear power plants

The advantages of nuclear generation facilities with small modular reactors (SMRs) were among the key topics at the World Atomic Week. Rosatom’s SMR projects are being implemented both in Russia and in Uzbekistan.

Sergey Generalov, Yakutia SNPP Project Director at AtomStroyExport, emphasized the transformative potential of SMRs for remote regions. “Hard-to-reach areas with harsh climates and geographically isolated territories receive a powerful boost for social, industrial, and economic development. Advanced nuclear technologies ensure reliable SMR operation for decades,” he said.

Pavel Bezrukov, Vice President and Uzbekistan NPP Project Director at AtomStroyExport, added: “This is not just a design — it is a proven and effective

technological solution. RITM-200 reactors have successfully operated for years aboard nuclear icebreakers. Adapted to meet onshore requirements, it is now the key technology for future SMR power units. By the end of this year, our design institutes will finalize the design of SMR units for the Uzbekistan project, and we will move into the main implementation phase in 2026."

Forum attendees also had the opportunity to explore Rosatom's standard SMR design in virtual reality. Developed by engineers from AtomStroyExport and AtomEnergoProekt (both part of Rosatom's Engineering Division), the VR experience showcases the SMR's core solutions, safety systems, and one-of-a-kind layout features.

Alexander Merten, Senior Vice President for International Business Development at AtomStroyExport, noted: "We offer our partners highly flexible and transparent cooperation models that include extensive involvement of local industry, guaranteed fuel supply, end-to-end lifecycle support, and personnel training. Combined with the highest safety standards and competitive pricing, this approach secures our leading position in the international market."

Photo by: *Strana Rosatom* newspaper, Rosatom