Center for Energy and Security Studies
www.ceness-russia.org

Mailing address: 3rd Tverskaya-Yamskaya, 24, office 5, Moscow, 125047, Russia
Tel.: +7 (495) 227-0829, fax: +7 (499) 176-0829
E-mail: ceness@ceness-russia.org

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US-RUSSIAN 123 AGREEMENT ENTERS INTO FORCE: WHAT NEXT?*

By Anton Khlopkov**

On January 11, 2011 the US-Russian agreement on peaceful nuclear energy cooperation, also known as the 123 Agreement, entered into force. Diplomatic notes to that effect were exchanged at a special ceremony in Moscow attended by Russian Deputy Foreign Minister Sergey Ryabkov and the US Ambassador to Russia, John Byerle. The agreement puts in place the legal framework for civilian nuclear energy cooperation between the two countries for the next 30 years.

At the start of 2010, Russia developed the legal basis for cooperation in the peaceful uses of nuclear energy with 53 countries[1], and the United States with 48 countries plus Taiwan[2]. But paradoxically, the world's two largest nuclear powers - not just in terms of nuclear weapons but civilian nuclear industry as well - did not have such a basis with each other. There was therefore no common legal basis for equitable, sustainable and comprehensive nuclear energy cooperation between Russia and the United States. The US-Soviet agreements to that effect concluded in 1973[3] and 1990[4] did not cover all possible areas of cooperation and had long expired. Joint nuclear projects were few and far between; all of them were regulated by ad-hoc documents or special executive orders of the two heads of state.

It therefore wouldn't be a stretch to describe the event that happened on December 8, 2010 as historic. That is when the US-Russian agreement for cooperation in the field of peaceful uses of nuclear energy finally passed the vetting of the US Congress. All such documents signed with foreign countries are termed "123 Agreement" in the United States; 123 is the number of the section regulating international cooperation with other nations in US Atomic Energy Act of 1954. The last formal step was made on January 11, 2011, when Moscow and Washington exchanged diplomatic notes to confirm that all the national procedures needed for the agreement to enter into force had been completed (Russian law does not require the agreement to be ratified).

This article looks at the history of the US-Russian 123 Agreement and analyses the prospects for civilian nuclear energy cooperation between the two countries.

Russia's first brush with 123

The Russian nuclear industry first realized the importance of having a 123 Agreement in place with the United States back in 1991. That is when industry representatives brought to the United States a prototype of a space nuclear reactor called *Topaz-2*, which was exhibited at two space industry events held in January, one in Albuquerque, the other in the University of Maryland.

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** - **Anton Khlopkov** is Director of the Moscow-based Center for Energy and Security Studies (CENESS), and Editor-in-Chief of the Nuclear Club journal (e-mail: khlopkov@ceness-russia.org).

Mailing address: 3rd Tverskaya-Yamskaya, 24, office 5, Moscow, 125047, Russia
Tel.: +7 (495) 227-0829, fax: +7 (499) 176-0829
E-mail: ceness@ceness-russia.org

The unit was designed for use as an electric power source for intelligence and broadcast satellites, and was met with great interest in the United States. But when the time came to take the reactor back to Moscow, US customs refused to let it out of the country, much to the consternation of the Soviet visitors who had brought it.

Customs officials said a special license was required, and the licensing authorities refused to issue such a license, citing the US Atomic Energy Act of 1954.

The act severely restricts nuclear cooperation with any foreign country that has not signed a 123 Agreement with the United States. Soviet scientists were forced to return to Moscow without *Topaz*. It was only in May 1991 that the US president issued an executive order authorizing the return of the space reactor to the Soviet Union.[5]

Moscow has been raising the need to eliminate legal barriers to cooperation in high-tech industries with the United States since the early 1990s, using various channels and venues. The issue was high on the agenda of the first official meeting between presidents Yeltsin and Clinton held in Vancouver in April 1993.[6] Moscow's concerns over hurdles faced by Russian high-tech companies in the American market, as well as restrictions on exports of American high-tech produce to Russia were also expressed in Yeltsin's letter to Bill Clinton of July 10, 1997.[7]

Iran's role

Consultations about the possibility of signing a 123 Agreement began in the mid-1990s. Washington made any commercial nuclear industry relations with Russia conditional on Moscow's commitment to stop its nuclear cooperation with Iran and end its involvement in the project to build a nuclear power plant in Bushehr. (Russia and Iran signed an intergovernmental agreement on peaceful nuclear energy cooperation on August 24, 1992; on January 8, 1995 they signed a contract for the completion of the first nuclear reactor in Bushehr.)[8] During a meeting with Russian Prime Minister Yevgeny Primakov held in November 1998 on the sidelines of an ASEAN summit in Kuala Lumpur, Vice President Al Gore said that Russia had to choose between nuclear cooperation with Iran or the United States.[9] From Washington's point of view, cooperation with both at the same time was impossible. America's position remained unchanged throughout President Clinton's two terms of office and during the first years of George Bush's tenure.[10]

As result of review of the US nuclear energy strategy, and renewed efforts to support US nuclear exporters on the foreign markets, in late 2005 the Bush administration publicly recognized that the light water energy reactor being built in Bushehr posed no nuclear proliferation threat. Another factor that made Washington reconsider its previous stance was the agreement signed between Moscow and Tehran on February 28, 2005, under which all spent nuclear fuel from the Bushehr plant is to be removed back to Russia. Nevertheless, for a long time the beginning of talks on the 123 Agreement remained conditional on Moscow's and Washington's ability to work out a common approach to Iran's clandestine nuclear activities that came to light in August 2002.

Mailing address: 3rd Tverskaya-Yamskaya, 24, office 5, Moscow, 125047, Russia
Tel.: +7 (495) 227-0829, fax: +7 (499) 176-0829
E-mail: ceness@ceness-russia.org

Significant progress was made in the summer of 2006. At a meeting in Vienna on June 1, the five permanent UN Security Council members plus Germany agreed a joint proposal to resolve the crisis over the Iranian nuclear program. The proposal was handed over to Iranian representatives in Tehran on June 6, 2006.[11] After that the US-Russian contacts on the 123 Agreement were stepped up. Following talks held ahead of the G8 summit in St Petersburg on July 15, 2006 presidents Putin and Bush instructed their governments to begin consultations with the aim of signing 123.[12]

The draft of the agreement was ready by early 2007. Only a few provisions had yet to be finalized. But that coincided with growing rivalry between the two countries in the former Soviet republics. Proponents of a conservative line in relations with Moscow once again had the upper hand. As one member of the administration at the time put it, an influential group of hardliners essentially sabotaged the implementation of the US president's orders and of the agreements already reached by the two delegations.[13] As a result, the 123 Agreement was initialed only on June 29, 2007.

It then took another 10 months for the document to be officially signed. At a meeting in Sochi on April 6, 2008 the Russian and US presidents agreed that 123 should be signed and enacted as soon as possible. That intention was reflected in the US-Russian Strategic Framework Declaration.[14] The official signing ceremony took place on May 6, 2008, the last day of President Putin's second term of office.

Role of Congress

Under American legislation, the 123 Agreement with Russia is not subject to ratification – but Congress has the opportunity to review it for 90 days of continuous session. The agreement then becomes effective unless both houses pass a joint resolution disapproving the proposed deal.

President Bush submitted the agreement for congressional review on May 13, 2008, when there were only 77 days of continuous session left (rather than the required 90) before the last sitting of the 110th Congress.[15] That meant that the whole procedure was doomed to failure from the very beginning. There was only one alternative way of having the agreement pass congressional vetting: both houses needed to vote for a resolution explicitly supporting the deal. But it was not a realistic one. Meanwhile, the final session of the old House of Representatives held after the election of the new one - the so-called lame-duck session - lasted for only 5 days rather than the 13 required for the 90-day term to be fulfilled.[16] Members of the Bush administration later blamed the situation on a "technical error" in counting the number of the remaining congressional session days when the 123 Agreement was being submitted to Congress. On September 8, 2008 the White House recalled the agreement from Congress using the Georgian crisis as a pretext. But that did not change anything: the agreement would have had to be re-submitted for congressional review in any event.

After Barak Obama's victory in the presidential elections on November 4, 2008 the issue of the 123 Agreement was once again in the competence of a Democratic administration. Presidents Medvedev and Obama discussed it during their first

Mailing address: 3rd Tverskaya-Yamskaya, 24, office 5, Moscow, 125047, Russia
Tel.: +7 (495) 227-0829, fax: +7 (499) 176-0829
E-mail: ceness@ceness-russia.org

meeting in London on April 1, 2009. In a joint statement they said both sides would work to bring the bilateral agreement on peaceful nuclear energy cooperation into force.[17]

That intention was reiterated in a joint statement on nuclear energy cooperation made after a summit in Moscow on July 6, 2009. The two presidents also agreed to set up a working group on nuclear energy and nuclear security within the bilateral presidential commission.[18] Sergey Kirienko, head of the Rosatom state nuclear energy corporation, and Dan Poneman, a deputy energy secretary, were appointed as the working group's co-chairmen. However, nuclear energy issues were not high on the agenda of the first two presidential meetings in London and Moscow. Those were dominated by the proposed new START treaty and the opening of a new transit corridor for the supply of NATO forces in Afghanistan.

The new US administration also insisted on linking nuclear energy cooperation with Russia to progress on the Iranian nuclear problem. The Obama administration also let it be known that it views the ratification of the new START treaty as a higher priority than the 123 Agreement. It would therefore re-submit 123 for congressional review only after the START talks have been completed and the new treaty has been submitted to the Senate.

But the START talks took longer than expected, and the Obama administration suddenly found itself facing the same problem as its Republican predecessors. New congressional elections were drawing near, and the window of opportunity to comply with the "90 days of continuous session" requirement was closing rapidly. The administration now had to choose between submitting the 123 Agreement to Congress without any further delay or postponing the procedure until after the elections. The situation was further compounded by worries that submitting 123 to Congress before the new START treaty could complicate the ratification of that treaty.

In the end, with the coming Congress elections in mind, the two documents were submitted for congressional vetting almost simultaneously. The 123 Agreement was re-submitted on May 10, and the new START treaty was introduced on May 13, 2010. Shortly before that, on April 8, the two presidents met in Prague to sign START treaty and to discuss the Iranian nuclear problem. They made significant progress towards achieving common ground on a new UN Security Council resolution on Iran (Resolution 1929 was passed on June 9, 2010). The day after the meeting, on April 9, the Obama administration launched the intra-agency process for Agreement 123 ahead of its resubmission to Congress.[19]

The actual resubmission came when less than 90 days of continuous session was left before the next Congress elections. The calculation in the White House was that the lame-duck session would continue much longer than usual, and the 90-day term would be fulfilled. When Congress closed for the pre-election recess, the 123 Agreement was 13 days of session short of its 90-day goal; most experts agreed that a third re-submission would be required. But the lame-duck session of both houses lasted longer than at any time in the past 28 years. The last time it continued for 13

Mailing address: 3rd Tverskaya-Yamskaya, 24, office 5, Moscow, 125047, Russia
Tel.: +7 (495) 227-0829, fax: +7 (499) 176-0829
E-mail: ceness@ceness-russia.org

days or more was back in 1982. On December 8, 2010 the 90-day term had finally elapsed, and the way was clear for 123 Agreement with Russia to enter into force.

Areas of cooperation

Russian-US nuclear industry relations potentially contain elements of rivalry (especially for nuclear power plant and nuclear fuel contracts) as well as partnership. There is a number of areas where the two countries' nuclear industries can be complementary. In the short and medium time frame, the most likely areas for cooperation include uranium enrichment and joint development of innovative nuclear power reactor technology.

Uranium enrichment. There are 104 nuclear power reactors in operation in the United States. America is the largest market for nuclear fuel cycle services. The runners-up are France with 58 reactors and Japan with 55; Russia has 32. The United States is also a leading exporter of nuclear fuel (to Japan, South Korea, and etc.). However, well over half of America's own demand for enriched uranium is covered by imports. In order to end its dependence on foreign suppliers, the country is building new enrichment facilities based on the latest European centrifuge technology in Ohio and New Mexico. There are also plans to build two enrichment centers using technology that has not yet been commercially proven. One (in Ohio) will rely on an American centrifuge design, and the other (North Carolina) will use an Australian laser enrichment technology called *Silex*.

Russia has an internationally competitive nuclear separation industry based on gas centrifuge technology. It controls 40-45 per cent of the world enrichment capacity and is the largest exporter of uranium enrichment services. At present, half the energy output of US nuclear power plants is generated using Russian LEU downblended from weapons-grade uranium and supplied to the United States under the 1993 HEU-LEU agreement. These supplies bring Russia about 800m dollars every year. Since nuclear power accounts for about 20 per cent of electricity generation in the United States, it can be said that one in ten light bulbs in America is lit using Russian nuclear materials. But the HEU-LEU Agreement expires in 2013, and from then Russia will have to compete for a share of the US uranium market on purely commercial terms.

US imports of Russian uranium produce in 2014-2020 will have to remain within the agreed ceiling of about 20 per cent of the requirements of the existing reactors (supplies of fuel for any new reactors will not count towards the overall tally). The restriction stems from antidumping investigation launched in November 1991 against Soviet Union at the request of a group of US uranium producers and the trade union representing staff of the Department of Energy's enrichment plants. The actual Soviet supplies that triggered the investigation began in 1990. As a result, the United States imposed a protective 116 per cent import tariff on imports of Russian uranium. On October 16, 1992 the Russian Ministry of Atomic Energy and the US Department of Commerce signed an agreement to suspend the antidumping investigation. The deal lifted import tariffs on low-enriched uranium supplied under the intergovernmental HEU-LEU Agreement. But at the same time, it all but closed the US market to any commercial supplies of Russian uranium produce.

Mailing address: 3rd Tverskaya-Yamskaya, 24, office 5, Moscow, 125047, Russia
Tel.: +7 (495) 227-0829, fax: +7 (499) 176-0829
E-mail: ceness@ceness-russia.org

After almost two years of consultations, in February 2008 Rosatom (the successor of the Russian Ministry of Atomic Energy) and the Department of Commerce signed an amendment to the 1992 suspension agreement. The document allows commercial supplies of Russian uranium within the agreed quotas until 2020, whereupon all anti-dumping restrictions will be lifted. The amendment specifies the quotas on a year-by-year basis. In 2011 that quota will be a token 16.6 tonnes of uranium, which is not enough even for a single refueling of a 1,000 MW reactor. But by 2014 the quota will rise to 485 tonnes (enough to refuel 20 reactors). That translates into a roughly 20 per cent share of the US commercial market for reactor fuel over the period of 2014-2020. The figure does not take into account any Russian uranium supplies destined for new reactors that may be launched after 2011 – those supplies will not be subject to any restrictions.

In 2008 *Tenex*, the largest Russian exporter of low-enriched uranium and of enrichment service, launched a campaign to market its produce to American nuclear operators. The company is the only Russian supplier allowed access to the US market under the amendment to the 1992 suspension agreement. By the end of 2010 *Tenex* had won 11 long-term contracts with nine US companies to supply enriched uranium produce. The deals are worth about 5bn dollars. In October 2010 the company opened the US office of *TENAM Corporation*, a fully-owned subsidiary set up to facilitate and expand Russian presence on the American market.

It is important to note that these contracts are governed by the amendment to the 1992 deal; as such, they are not contingent on the 123 Agreement entering into force.

Uranium enrichment plant. One proposal that could become a real revolution in US-Russian relations is to build an enrichment plant in the United States based on Russian centrifuge technology. There is a possibility that the two projects relying on American centrifuge design and the Australian *Silex* laser enrichment technology will fail to reach the commercial enrichment targets within the designated time frame. In that case the United States will once again face the need to acquire additional uranium isotope separation capacity.

The idea of building a uranium enrichment plant in the United States using Russian centrifuge technology is not new. The first time US nuclear industry representatives expressed their interest in that technology was back in the mid-1990s. The then Russian nuclear energy minister, Victor Mikhaylov, proposed an alternative idea. Under his plan, the United States would be allowed to acquire a stake in one of the four Russian nuclear enrichment plants, which had a spare capacity. That plant would then produce low-enriched uranium destined for exports to the United States.[20] In 1998 top managers of the *USEC* corporation once again voiced the idea of building an enrichment plant in the United States using Russian technology. The new Russian nuclear energy minister, Evgeny Adamov, proposed a joint venture on US territory. Russia would contribute the centrifuges, while the United States would provide funding and build the required infrastructure. But the project never received the go-ahead.[21]

Mailing address: 3rd Tverskaya-Yamskaya, 24, office 5, Moscow, 125047, Russia
Tel.: +7 (495) 227-0829, fax: +7 (499) 176-0829
E-mail: ceness@ceness-russia.org

The idea was proposed once again by top managers of the American nuclear energy operators during a visit to the United States by Rosatom chief Sergey Kirienko in February 2008.[22] In August 2010 Kirienko himself mentioned the proposal in an interview with the *Financial Times*.[23]

The project to build an enrichment plant in the United States using Russian technology could improve the climate of Russian-US relations because it would require an unprecedented level of mutual trust. The two countries would need to agree measures to protect the sensitive centrifuge enrichment know-how being transferred, and to ensure the security of the Russian equipment being supplied. In essence, they would need to sign an agreement on the protection in the United States of information that constitutes state secret in Russia.

The precedent of an enrichment plant using Russian technology being built abroad already exists. The first stage of such a plant was launched in China in 1996, the second in 1998, the third in 2001 and the fourth is nearing completion. The total enrichment capacity of all four stages is 1.5m SWU.

Russia could be quite interested in such international projects because there is not enough demand for the produce of key Russian enrichment machinery suppliers on the domestic market. Centrifuges account for 80-95 per cent of those companies' business. At present they have a spare capacity, and only two large contracts: one to upgrade some of the equipment of Russia's four enrichment plants, the other to supply gas centrifuges to China. There were hopes for another large contract to build a new 5m SWU enrichment plant for the Russian-Kazakh Uranium Enrichment Center (UEC). That contract would keep up to 20 per cent of the Russian centrifuge producers' manufacturing capacity in business. But in June 2010 it was decided that the UEC joint venture would make use of an existing enrichment plant in Novouralsk, Sverdlovsk Region (Uralskiy Electrochemical Combine) rather than build a new one.[24] Meanwhile, the bulk of the deliveries on the Chinese contract were completed in 2010,[25] releasing even more spare capacity.

One important consideration is that the project to build a uranium enrichment plant in the United States using Russian technology would not necessarily be contingent on the 123 Agreement coming into force. But it would definitely require a separate intergovernmental agreement to be signed.

The US-Russian joint venture could also involve Japanese companies, which would be interested in acquiring a stake in a new enrichment plant and which are very closely integrated with the US nuclear industry. Consultations between Moscow and Tokyo on the possibility of setting up a uranium enrichment joint venture in either Russia or Japan have been under way for several years now. According to some reports, one potential Japanese partner is *Toshiba*, which intends to invest up to 100m dollars into *USEC's* isotope separation business.[26]

Spent nuclear fuel. One of the most controversial potential areas for US-Russian nuclear cooperation is the proposal to set up an International Spent Nuclear Fuel Management Center in Russia.

Mailing address: 3rd Tverskaya-Yamskaya, 24, office 5, Moscow, 125047, Russia
Tel.: +7 (495) 227-0829, fax: +7 (499) 176-0829
E-mail: ceness@ceness-russia.org

Russia is one of the world leaders in reprocessing spent energy reactor fuel. The first reprocessing plant, the RT-1, was launched at the Mayak combine in Ozersk, Chelyabinsk Region, back in 1976. The plant can reprocess 400t per annum of spent fuel from VVER-440 and BN-600 reactors, as well as research reactors and naval nuclear reactors installed on icebreakers and submarines. The reprocessed uranium is used to make fresh fuel for RBMK-type energy reactors, while the plutonium extracted from spent fuel is stockpiled.

In the United States reprocessing the spent fuel of nuclear power reactors is banned. According to various estimates, some 75 per cent of spent nuclear fuel that has been accumulated over the years in various third countries (excluding Russia) is “US-obligated". The term means that the spent fuel was made using American technology and/or materials; it therefore cannot be re-exported to other countries without the consent of the United States. That consent can only be granted if the destination country has signed a 123 Agreement with the United States, through that is not the only requirement.

In the late 1990 and early 2000s the Russian Ministry for Atomic Energy studied the possibility of setting up an International Spent Nuclear Fuel Management Center in Zheleznogorsk, Krasnoyarsk Krai, where a partially built reprocessing plant was sitting mothballed since Soviet times. The plan was that the center would reprocess and store spent fuel from Russia as well as foreign countries, which would provide the funds required to complete and launch the plant. The Ministry of Atomic Energy hoped to attract custom from Taiwan and South Korea, whose spent nuclear fuel is US-obligated, as well as from Switzerland. It had also pushed through changes to Russian environmental legislation to make the project possible. The ministry has always been one of the main lobbyists of the 123 Agreement with the United States.

The need to attract foreign investment into Russian reprocessing facilities became much less pressing following the adoption of a federal nuclear energy industry program for 2007-2015. The program has significantly improved the sector's financial situation. Meanwhile, the first stage of a dry spent nuclear fuel storage at the Zheleznogorsk plant is nearing completion, giving the government more breathing space for any decisions on reprocessing. The proposal to set up an international reprocessing facility in Russia has therefore ceased to be a priority for the Russian nuclear industry.

However, over the past few months various environmental groups in Russia have raised concerns that the 123 Agreement will open the floodgates to nuclear waste from other countries. It would therefore make sense for Rosatom to reiterate its position voiced several years ago by its chief Sergey Kirienko that Russia currently has no plans of accepting of foreign-origin spent nuclear fuel for storage or reprocessing.

At the same time, Rosatom could benefit from the fact that the law allows the removal of spent nuclear fuel of Russian origin back to Russia with no return of reprocessing products to the country where the spent nuclear fuel was produced. That is a serious

Mailing address: 3rd Tverskaya-Yamskaya, 24, office 5, Moscow, 125047, Russia
Tel.: +7 (495) 227-0829, fax: +7 (499) 176-0829
E-mail: ceness@ceness-russia.org

competitive advantage for the Russian nuclear exporters. It can be brought to bear when Russian companies bids for contracts to supply fuel to foreign nuclear power plants, both Russian and foreign-designed. Essentially, Rosatom can supply nuclear fuel on a lease scheme: deliver a fresh batch, then remove it back to Russia once it has been used up. Such a proposal could be especially attractive to Middle Eastern and Southeast Asian countries, many of which have grand plans for nuclear energy.[27] The lease scheme also has clear advantages in terms of nonproliferation. That is particularly important in the context of the nascent nuclear energy renaissance, with a whole number of countries, including those situated in conflict regions, declaring their aspiration to build their first nuclear power plant. At present, spent nuclear fuel is removed back to Russia from Bulgaria and Ukraine, which operate Soviet-designed reactors and use Russian fresh nuclear fuel. Rosatom will also remove spent nuclear fuel from the Bushehr nuclear plant in Iran, which is expected to start commercial electricity production soon.

In the short and medium time frame nuclear cooperation projects between Russia and other countries, including the United States, could focus on developing innovative new technologies for reprocessing of spent nuclear fuel and safe long-term storage of radioactive waste. One possible avenue for such cooperation would be to set up an international research center on Russian territory. Several countries, including Japan and the United States, have recently tried to implement independent programs for spent nuclear fuel management. These attempts have demonstrated that resolving the problem on a national level would require enormous financial and intellectual resources without any guarantees of success. To illustrate, the new reprocessing plant in Rokkasho (Japan) cost 18bn dollars to build, but still failed to provide a long-term solution. If several leading countries were to pool their efforts in this area, they could bring much greater intellectual resources to bear and share the financial burden of such an ambitious venture.

Other areas for cooperation. Other potential areas include joint development of innovative nuclear power reactor technology, including commercialization of fast neutron reactors. Russia already has a lot of experience in operating such reactors. The technology was first designated as one of the priority areas for cooperation in the 1973 Soviet-US Agreement for Scientific and Technical Cooperation in the Field of Peaceful Uses of Atomic Energy[28], and in a similar agreement signed on June 1, 1990.[29]

There is great scope for cooperation in developing a high-temperature gas reactor - that joint project between Russian and US researchers began several years ago. Another promising area is low-power reactors. Other areas include:

- Jointly developing an innovative nuclear power reactor that would be cheaper to build and operate, and make greater use of passive safety systems;
- Improving the efficiency of Russian-made light water reactors (by increasing their capacity factors);
- Involving US companies in joint production of some equipment for Russian-designed nuclear power plants, as well as outsourcing some components to US suppliers;

Mailing address: 3rd Tverskaya-Yamskaya, 24, office 5, Moscow, 125047, Russia
Tel.: +7 (495) 227-0829, fax: +7 (499) 176-0829
E-mail: ceness@ceness-russia.org

- Joint projects to build nuclear power plants in third countries;
- Cooperation in improving the safety and security of nuclear reactors, facilities and materials in third countries.

Conclusion

The US-Russian 123 Agreement paves the way for long-term nuclear energy cooperation between the two countries. However, at this time there aren't any specific projects whose implementation would be contingent on the 123 Agreement entering into force.

The commercial contracts for the supply of low-enriched uranium and enrichment services until 2020, when all the remaining restrictions on American imports of Russian uranium produce will be lifted, do not depend on 123 (until Amendment to the US-Russian antidumping investigation suspension agreement is in force). Neither does the proposed American uranium enrichment plant based on Russian centrifuge technology. The Russian nuclear industry's earlier efforts to speed up the signing of the agreement were made with some specific projects in mind. The most important of them was the proposal to bring US-obligated spent nuclear fuel from third countries to Russia for reprocessing and storage. (That proposal has since been relegated down the list of the Russian nuclear industry's priorities.) The importance of the 123 Agreement therefore lies in the area of long-term interests rather than any immediate plans.

The next objective for the Russian and US governments is to create a sound legal footing for their nuclear energy cooperation to involve third countries. At present, under Paragraph 2 Article 8 of the 123 Agreement, nuclear materials transferred by Russia to the United States or vice versa cannot be transferred beyond the territorial jurisdiction of the recipient country unless the countries agree otherwise.[30] Essentially Moscow and Washington will have to agree a list of countries to which nuclear material of Russian origin can be re-exported by the United States without seeking Moscow's consent on a case-by-case basis. The absence of such a list would be a formal obstacle to exporting US-made nuclear fuel originating from Russian uranium to long-standing US customers such as South Korea or Japan. At present, the re-export procedure is governed by the 2008 amendment to the 1992 deal on suspending the antidumping investigation against Russian uranium producers.

The American and Russian nuclear industries are both interested in simplifying the procedure of re-exporting nuclear materials of Russian origin. If the existing restrictions remain in place, some of the traditional US customers (including South Korea and Japan) could choose to place their orders for nuclear fuel elsewhere. That would be a blow for the US producers of reactor fuel as well as for the Russian exporters of uranium produce.

The Russian uranium enrichment technology remains highly competitive internationally. That underpins all the most financially attractive projects and proposals for US-Russian nuclear industry cooperation. These include the supply of Russian uranium produce to the United States, the proposal to build an enrichment plant in the United States using Russian technology, and any future US exports of

Mailing address: 3rd Tverskaya-Yamskaya, 24, office 5, Moscow, 125047, Russia
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E-mail: ceness@ceness-russia.org

nuclear fuel made from Russian uranium. Starting from 2014 all Russian supplies of uranium to the United States will be made on a purely commercial basis. Over the period until 2020, up to 20 per cent of the nuclear fuel used by the existing American nuclear reactors could be made from Russian enriched uranium.

The project to build a nuclear enrichment plant in the United States using Russian technology would be a real breakthrough not only in nuclear cooperation but also in the wider US-Russian relations. Such a project would require an unprecedented level of mutual trust. Moscow and Washington would also need to negotiate a bilateral agreement on protecting the sensitive centrifuge technology being transferred and ensuring the security of the equipment being supplied.

The creation of an international spent nuclear fuel management center in Russia is unlikely in the short or medium time frame, as is the removal of US-obligated spent nuclear fuel from third countries to Russia in any significant quantities. At the same time, Russian legislation and the new 123 Agreement enable Russia to offer a nuclear fuel lease scheme to countries which operate reactors built using US nuclear technology or materials. The two most promising markets here are the Middle East and Southeast Asia. The guaranteed removal of spent Russian nuclear fuel back to Russia would be especially attractive to countries which have no experience in handling such materials and which also have to contend with increased security risks in their region. The 123 Agreement could therefore contribute to strengthening the nonproliferation regime in the long term.

Another promising area for cooperation is developing innovative nuclear power reactor technologies, including fast reactors, high-temperature gas-cooled reactors and low-power reactors. The Nuclear Energy and Nuclear Security working group set up as part of the US-Russian presidential commission in July 2009 has the potential to foster closer cooperation between the two countries. But for that to happen Moscow and Washington will have to find the right balance between the two key areas reflected in the working group's name. Up until now, nuclear security and nonproliferation have dominated the US-Russian nuclear agenda, sidelining cooperation on civilian nuclear energy. To illustrate, the 11 practical steps agreed at the working group's third meeting on December 6-7 are all related to various nonproliferation projects.

The working group has a nuclear energy subgroup, which should become an important facilitator of closer cooperation between the two countries in civilian nuclear technology. As one of its first steps the subgroup could agree a list of priority civilian nuclear energy projects for the short and medium time frame.

The 123 Agreement has one other welcome consequence for the Russian nuclear industry: it removes one of the barriers to nuclear energy cooperation with Tokyo. Japan’s *Toshiba* and *Hitachi* corporations maintain close partnership with America's *Westinghouse* and *General Electric*. For that reason they have been very cautious about pursuing cooperation with Russia so as not to jeopardize their business in the United States. Japanese officials have said quite unambiguously that the nuclear energy cooperation agreement signed by Moscow and Tokyo on May 12, 2009 will be

Mailing address: 3rd Tverskaya-Yamskaya, 24, office 5, Moscow, 125047, Russia
Tel.: +7 (495) 227-0829, fax: +7 (499) 176-0829
E-mail: ceness@ceness-russia.org

ratified by the Diet (Japanese parliament) not earlier than the US-Russian 123 Agreement has entered into force. The list of potential areas for nuclear energy cooperation between Russia and Japan is quite extensive. It includes the outsourcing of components for Russian-designed nuclear power plants to Japanese subcontractors and the proposed uranium enrichment joint venture.

One other important outcome that will hopefully result from broader contacts between the US and Russian nuclear industries is an improvement in Russia's reputation on nuclear security, export controls and nonproliferation. Russia's negative image in these areas dates back to the early 1990s. It is based on a combination of real problems that existed back at the time and Hollywood-type stories in the media. Up until now, that image has often stood in the way of practical contacts and politicized nuclear energy cooperation between Russia and the United States, especially during Congressional debates.

Notes

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Mailing address: 3rd Tverskaya-Yamskaya, 24, office 5, Moscow, 125047, Russia
Tel.: +7 (495) 227-0829, fax: +7 (499) 176-0829
E-mail: ceness@ceness-russia.org

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Mailing address: 3rd Tverskaya-Yamskaya, 24, office 5, Moscow, 125047, Russia
Tel.: +7 (495) 227-0829, fax: +7 (499) 176-0829
E-mail: ceness@ceness-russia.org

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