

Russia's Contribution to the Nuclear Renaissance

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Ladies and gentlemen, dear colleagues, participants and guests of the Symposium!

I attend for the first time a Symposium of the World Nuclear Association and it is a great pleasure for me to address this highly esteemed audience. This year is special for Russia – in September we celebrate the 60th anniversary of the Russian nuclear industry. Over the years, thanks to the efforts of numerous scientists, engineers and specialists, a powerful nuclear industry has been created, and fundamental scientific achievements have been made.

Oriental people say that sixty is the age of wisdom, when a person is healthy, full of energy for creative development and capable of learning from the past mistakes – his own and others'. The topic of this Symposium – “Challenges of the Nuclear Renaissance: the Future is Now” – is exactly to the point, and, as I understand, was not selected by chance. True, after rather a long period of stagnation, we can clearly observe the signs of nuclear renaissance in various parts of the world. Having achieved the age of wisdom, we have realized that global nuclear power, despite local features of national nuclear programs, is a unified immense organism whose health depends on the condition of its components.

World economic development is accompanied by a continuous growth of energy consumption. According to estimates in the last 60 years, over 250 billion tons of conventional fuel has been produced and used in the world – the same amount as had been used by all previous generations. Access to power resources is associated with severe competition intensifying under economic globalization. In response to the question whether nuclear power has a future, we reply that a large-scale peaceful use of nuclear energy could and should become the symbol of the 21st century.

Long-term analyses done by the Intergovernmental Panel on Climate Change (IPCC), the International Energy Agency of the Organization for Economic Cooperation and Development (OECD IEA) and other agencies show that by 2050 the total installed NPP capacity in the world may increase four times over and reach about 2000 GWe.

Today, at ten Russian NPPs, 31 power units are in operation with a total installed capacity of 23.2 MWe. The average share of NPPs in electricity generation is 16.5

percent (21 percent in European Russia, of which the North West regions account for 42 percent, and the Central and Volga regions, 30 percent). In 2004 the total output of Russian NPPs was 143 billion kW-hours, and the average capacity factor was 73.2 percent. The actual and expected dynamics of these parameters demonstrate a steady growth since the late 1990s.

In compliance with the concept for development of nuclear power in Russia, it is planned to build and commission before 2011 a minimum of three units with VVER-1000 reactors –Volgodon-2, Balakovo-5 and Kalinin-4. In the period from 2011 to 2020 the capacity is planned to increase by 10 GWe. Nuclear power in Russia will be further developed by both the construction of new NPPs with VVER-1000 reactors, and by development and deployment of advanced designs, including power units with VVER-1500 reactors, as well as VK-300 and VBER-300 reactors for combined generation of electricity and heat.

Nuclear safety is an indispensable factor of the nuclear industry development. In this context, I would like to mention that in Russia in 2004 and first half of 2005 no violations were reported that could be classified according to the INES international scale. As in the previous years, the radiation levels at NPPs and adjacent territories were in compliance with the standards of normal operations and did not exceed the background values. It is important to note that hazardous chemicals released into the atmosphere by Russian nuclear facilities were below 0.6 percent of the total non-nuclear industrial emissions.

Export of nuclear power technologies has been actively developing: construction of power units with VVER-1000 reactors is underway – two at Tianwan (China), two at Kudankulam (India) and one at Buser (Iran).

The problem of resources availability in the long term and the need to utilize plutonium stockpiles justify a serious interest to power generation by fast reactors. We have been working at an advanced sodium-cooled BN-800 reactor, which is expected to be commissioned at Beloyarsk NPP early in the second decade, and also a fast reactor with a heavy liquid metal coolant.

Today the Russian nuclear industry to a great extent follows the path laid down by the administrative reform of 2004. Important decisions were made to create a state system for management of radioactive waste. Work has begun to formulate a waste management doctrine that will underlay the future state radwaste management system.

Dear colleagues, the steady operation of global nuclear power depends to a large extent on the performance of the Russian nuclear fuel cycle industry. It is associated with the high potential of Russian industry, primarily enrichment facilities. Today over 40 percent of global enrichment services are of Russian origin.

On the nuclear fuel market Russia satisfies the demand of 76 power reactors in 13 countries, or 17 percent of the global market. 45 of these reactors are located outside the Russian Federation.

We are interested in international cooperation in the field of spent nuclear fuel management. The necessary regulatory and legal framework has been created in Russia. An important step in this direction was ratification in March 2005 by the RF State Duma of the Vienna Convention on civil liability for nuclear damage.

We are fully aware that nuclear power development is an important prerequisite for global economic advancement. To realize its potential to the fullest extent, it would be necessary to resolve a number of problems.

For instance, an alarming situation is emerging in the supply of feed material for nuclear fuel fabrication. The existing imbalance between production and consumption of natural uranium is a “delayed action bomb” for the global nuclear industry. Serious measures are to be taken to enhance natural uranium production. I would like to note that Russia also realizes the need to move forward in this direction.

We also consider it highly important to take further steps to improve the economic competitiveness of nuclear power.

A growing demand for uranium enrichment services necessitates a critical evaluation of future availability of the global capacities in view of the fact that nuclear power is on the verge of replacement of obsolete gas diffusion technology.

Along with “strategic” threats to the development of peaceful nuclear industry, there exist “local” threats, for instance inadequate infrastructure for nuclear materials transportation.

Obviously, the nuclear power market should operate on the basis of free competition between suppliers, but in compliance with stringent requirements and principles of non-proliferation. I shall dwell on this subject separately.

I have to state with regret that, despite the obvious advantages of open market principles, the uranium market still remains a “haven of refuge” for trade barriers. I would like to emphasize that Russian industry encounters these barriers very closely, and to our regret this issue has become a custom. Artificial containment of Russian presence takes place along with the final steps of Russia joining the WTO and global acknowledgement of Russia as a market economy country. Finally, these artificial market skews are harmful for global nuclear power and offer additional competitive advantages to fossil fuel energy, where such practices are absent in principle.

The threats associated with the higher risks of nuclear materials and sensitive technologies falling into the hands of terrorists during expanded peaceful applications of nuclear power demand adequate, or better, preemptive measures to strengthen the international non-proliferation regime.

Of principal importance is further consolidation of the role and authority of the IAEA, a competent international organization that ensures international cooperation in the field on a global scale.

New proliferation challenges, including identification of a black market in nuclear materials and technologies, have brought to life numerous initiatives aimed at strengthening international cooperation to combat illegal turnover of weapons of mass destruction (WMD), their delivery systems, materials and technologies related to their production.

In June 2004 at Sea-Island, the G-8 leaders adopted an action plan on non-proliferation calling for the suppliers of nuclear technologies “to take new measures to prevent exports of sensitive technologies with proliferation potential to countries that may strive to using them for weapons purposes or permit them falling in terrorists hands”. They agreed on imposing a year-long moratorium on the transfer of equipment and technologies for uranium enrichment and spent fuel reprocessing, which was prolonged this July during the summit at Gleneagles.

IAEA Director General Mohamed El-Baradei put forward an initiative and in 2004 created an Expert Group to analyze multilateral approaches to the nuclear fuel cycle. In February 2005 the Group issued a very interesting report based on work done within a very short time. We should jointly think how to put into practice their recommendations to avoid the construction of dividing lines and antagonism between developing and industrialized nations.

Aware of the importance of this issue, Rosatom, jointly with the IAEA and various Russian nuclear industry enterprises and organizations, held an International Conference on “Multilateral technological and institutional approaches to nuclear fuel cycle for strengthening non-proliferation regime” (13-15 July 2005, Moscow). The Conference was attended by 220 specialists from 23 countries and international organizations.

The Conference participants noted that various multilateral approaches could be useful in addressing the priority issue – ensuring guaranteed fuel supply to the countries that forego the development of national uranium enrichment technologies and capacities. We believe that the current capabilities of global suppliers of uranium products and services, along with the well-adjusted market mechanism, provide a good basis to ensure the necessary guarantees of supplies in the short-term perspective. Additional guarantees in the case that deliveries due under the basic commercial contract are disrupted and are not the fault of the importing country should be provided by combined efforts of the global enrichment industry, supplying countries and the IAEA. A mechanism of such guarantees to satisfy all the interested parties remains to be developed.

Our commercial proposals on the construction of NPPs in non-nuclear weapon states envisage the delivery of power units on a turn-key basis, including liabilities to deliver nuclear fuel and return spent nuclear fuel throughout the term of NPP operation. Thus an importing country obtains a guaranteed access to the advantages of peaceful use of nuclear energy on the most economically attractive terms.

Significant progress has been made in Russia in halting production of weapons grade plutonium and utilization of its stockpiles. As you know, a relevant program is being implemented by Russia in close cooperation with the US. Pursuant to the US-Russia Agreement the operating plutonium-producing reactors in Zheleznogorsk and Seversk are scheduled to be shutdown in 2008. By this time it is planned to construct replacement capacities to supply the regions with electricity and heat. The US is involved in financing the construction of replacement capacities that started in 2004. This year Russia and the United States succeeded in finding a mutually acceptable solution to the issue of civil liability for nuclear damage, and we hope it will give a positive impetus to the efforts.

This year is a jubilee year not only for the Russian nuclear industry. It is also a significant milestone in the implementation of the Agreement between the Government of the Russian Federation and the Government of the United States of America concerning the disposition of highly enriched uranium extracted from nuclear weapons, dated 18 February 1993 (the HEU-LEU Agreement, also known by the world community as the “Megatons to Megawatts” program. From the time of shipment of the first LEU on 31 May 1995 we have delivered to the US about 7350 metric tons of the material downblended from 250 metric tons of HEU – half of the total 500 metric tons envisaged by the HEU-LEU Agreement.

Thus the “Megatons to Megawatts” program has crossed the “qualitative equator” and entered its final stage. In terms of nuclear disarmament it means irreversible dismantling of about ten thousand warheads.

All the monetary proceeds from implementing the HEU-LEU Agreement are channeled to the Russian Federal budget. They are a source of financing for the programs for improving the safety of Russian NPPs, the conversion of defense enterprises and the environmental rehabilitation of contaminated territories. It was mentioned several times in the past that the HEU-LEU Agreement is a unique historical example when the goals of nuclear disarmament and non-proliferation are attained in a cost-free commercial way.

Practical experience shows that large-scale R&D programs necessary for creating new nuclear power in the 21st century could be most effectively implemented by international cooperation combining the resources of the participating countries. In this context, international organizations, primarily the IAEA, play an increasingly important role. In our opinion coordination of research in nuclear power and consolidation of efforts of the IAEA member-states pursuing the development of innovative nuclear energy technologies is the key component in this cooperation.

Today the cooperation between several IAEA member-states is being realized in the International Project on Innovative Reactors and Fuel Cycles (INPRO). Currently Phase I of the project is close to completion, during which a methodology for evaluation of Innovative Nuclear Energy Systems (INS) has been developed and tested. Main goals have been approved and work has begun at the final stage of Phase I on “Evaluation of INS Using the INPRO Methodology” (January 2005 – June 2006). Within the framework of this stage Russia proposed to carry out a joint study on the evaluation of an INS based on a closed nuclear fuel cycle with fast reactors. The Russian initiative has been supported by China, India, France and the Republic of Korea.

The enhancement of the role of INPRO, the involvement of states simultaneously participating in another US-initiated international project on advanced nuclear technologies – Generation-IV International Forum (GIF) – puts on the agenda a closer cooperation and rapprochement of these projects.

In conclusion I would like to emphasize once again the importance of international cooperation in the search for responses to challenges the nuclear renaissance is faced with. In 2006 Russia will chair the G-8. Rosatom is actively involved in working out a concept and topics of the Russian chairmanship including diversification of power supply through new sources of energy, creation of favorable conditions to a prospective transfer to a qualitatively new

environmentally clean power, further development of safe nuclear power, including a closed nuclear fuel cycle.

In these undertakings we count on your involvement and support, and are confident that by joint efforts we shall succeed in enhancing the role of nuclear power in the strategy of a global energy security.

Thank you for your attention.