

**Report on Nuclear Energy Use Issues  
of the Energy and Energy Policy  
Joint U.S.-Russian Commission  
on Economic and Technological Cooperation  
(Washington, March 1999)**

In the time since the last meeting of the Committee in March 1998 several aspects of U.S.-Russian cooperation in the field of nuclear energy underwent further development and received support at the July 1998 meeting of the Chairman of the Russian Federation Government and the Vice President of the United States, and at the summit of the Presidents of the United States and Russia in September 1998. They indicated new areas of collaboration for our countries, requiring systematic and careful discussion and an integrated approach to implementation.

During the 10th Session of the Commission in March 1998, and the meeting of the Co-chairmen of the Commission in July 1998, joint decisions were adopted on several complicated problems relating to cooperation in the area of management of plutonium derived from nuclear military programs. In July 1998, an Agreement on Scientific and Technical Cooperation in the Field of Management and Disposition of the Plutonium From Nuclear Military Programs was signed.

In September 1998, the Presidents of both countries signed a statement of principles of the management and disposition of plutonium declared not needed for defense purposes.

In a meeting in Vienna, Russian Minister of Atomic Energy Ye. O. Adamov and U.S. Secretary of Energy B. Richardson signed an intergovernmental Agreement on the Nuclear Cities Initiative.

Now our countries face the important task of improving cooperation with an orientation on the future, having in mind that the field of cooperation of our countries on atomic energy, nuclear materials and technologies, and nuclear disarmament is so serious that it must be outside the influence of the political circumstances of the day.

## **ORGANIZATIONAL ISSUES**

### **1. Establishment of a Nuclear Energy Committee.**

During the Moscow Summit on nuclear safety and security issues held in April 1996, Russian President B. N. Yeltsin proposed a specific plan to strengthen nuclear safety and security in the broadest aspect, which was approved by U.S. President Bill Clinton. Many aspects of U.S.-Russian cooperation, including new directions in the area of nuclear safety and security, were supported at the Summit of the Russian and U.S. Presidents held in Moscow in September 1998.

There is a mutual interest of the sides to obtain the benefits of the civil use of nuclear energy in an economically optimal manner while focusing on issues of fissile material reduction and security, nonproliferation, nuclear safety and public health, and reduction of harmful influences

on the environment. All of these issues fall within the framework of the Joint U.S.-Russian Commission on Economic and Technological Cooperation.

In the course of consultations which have taken place, understanding was reached that the tasks of the Committee will be to:

- consider a number of broad issues related to economic, scientific, and technological-cooperation between Russia and the U.S. in the nuclear area, including nuclear materials and energy-related matters; DOD-Minatomb programs; security and nonproliferation programs; and nuclear safety and regulation.
- find solutions to existing problems and develop new directions and mechanisms of cooperation aimed at improving U.S.-Russian cooperation in the nuclear area;
- facilitate cooperation between Russian ministries and U.S. agencies in the nuclear area.

The establishment and activities of a permanent standing Committee on Nuclear Energy within the framework of the Commission represents a positive step forward in U.S.-Russian cooperation and objectively accords with the status of and prospects for that cooperation.

The Committee may be a forum for addressing additional areas of mutual concern regarding the nuclear field.

It is proposed to approve the establishment of a Committee on Nuclear Energy within the framework of the Commission.

## **COOPERATION IN THE FIELD OF NUCLEAR WEAPONS DISARMAMENT AND DISMANTLEMENT**

### **1. Cooperation on the implementation of the intergovernmental Russian-U.S. Agreement Concerning the Use of Highly-Enriched Uranium Extracted from Russian Nuclear Weapons (HEU-LEU).**

In accordance with the tasking given by Russian President B. N. Yeltsin and U.S. President Bill Clinton at the time of their last meeting in Moscow, and since the signing of the Joint Statement of Minister of the Russian Federation for Atomic Energy E. O. Adamov and United States Secretary of Energy B. Richardson in Vienna in September 1998, the Russian and the U.S. sides have made efforts to address the critical situation that has developed in the implementation of the intergovernmental Russian-U.S. Agreement Concerning the Use of Highly-Enriched Uranium Extracted from Russian Nuclear Weapons (the HEU-LEU Agreement).

On 21 October 1998, the U.S. Congress adopted a decision to appropriate \$325 million from the U.S. budget for the U.S. side to acquire the natural uranium hexafluoride equivalent quantity of the natural uranium component of the 1997-98 LEU shipments. This uranium should become part of the U.S. Department of Energy's stockpiled reserves.

The Congress will allocate the above mentioned funds on condition that Russia and the western companies sign a long-term contract for the marketing of the natural uranium component for shipments during 1999 and future years.

A number of measures directed at the urgent and practical settlement of these issues have been agreed upon and submitted to the government of the United States and the government of the Russian Federation as the result of the efforts of the Ministry of Atomic Energy (Minatom) and the Department of Energy (DOE).

These measures include the exchange of diplomatic notes on behalf of the government of the Russian Federation and the United States of America and the signing of appropriate agreements between Minatom and DOE.

The commercial contract with western companies, including Cameco, Cogema and Nukem, has also been approved and will also be signed during the Committee meeting, simultaneously with the government documents.

Thus, the urgent tasks set forth during the Moscow Summit will be fulfilled and will contribute to the implementation of the vital HEU-LEU Agreement for the benefit of the U.S., Russia and global security.

**1a. Antidumping.**

The Russian side has noted the recent changes in the uranium market and the resulting necessity for amendments to the 1992 Agreement Suspending the Antidumping Investigation on Uranium. Discussions concerning amendments to this agreement will begin next month.

**1b. Transparency measures for the HEU under the US-Russian HEU-LEU Agreement.**

A Transparency Review Committee (TRC) was formed in accordance with the Memorandum of Understanding between the Government of the Russian Federation and the Government of the United States of America Relating to Transparency and Additional Arrangements Concerning 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 of 1 September 1993, and the Protocol on Transparency Arrangements concerning Highly-Enriched Uranium for the purpose of implementing the provisions of the Memorandum of Understanding of 1 September 1993. In 1998, U.S. technical experts conducted six monitoring visits at the Siberian Chemical Enterprise in Seversk, five monitoring visits at Mayak P.O. and six monitoring visits at the Electrochemical Plant in Zelenogorsk.

In December 1998, there was a meeting of Russian and U.S. technical experts to discuss the installation of nondestructive analysis equipment that is planned to be mounted on the HEU blending point at the Ural Electrochemical Integrated Enterprise in Novouralsk. The installation of the equipment was completed in January-February 1999.

In February of this year, there were bilateral talks on transparency matters, in which the sides discussed the results of cooperation and laid out plans for the future.

## **2. Disposition of Plutonium Declared to be No Longer Needed for Defense Purposes.**

The major result of the work in the first stage of cooperation was a joint U.S.-Russian report to the Presidents of the two countries, in which conceptual and technical-economic studies of the various options for weapons plutonium disposition were outlined.

On 24 July 1998, at the working meeting of the co-chairmen of the U.S.- Russian Commission on Economic and Technological Cooperation in Moscow, an intergovernmental U.S.-Russian Agreement on Scientific and Technical Cooperation in the Field of Disposition of Plutonium Derived from Nuclear Military Programs was signed.

The major areas of cooperation and technical study will include:

- A) conversion of metallic plutonium into an oxide suitable for the fabrication of MOX fuel for various types of power reactors;
- B) use of Plutonium in the form of MOX fuel in thermal nuclear power reactors;
- C) use of plutonium in the form of MOX fuel in fast reactors;
- D) immobilization of plutonium, including wastes and hard-to-process forms, and
- E) development of gas-cooled reactor technology to dispose of plutonium.

At the beginning of December 1998 the first meeting of this Committee was held. The second meeting of the Committee will take place in June-July 1999 in Moscow.

In September 1998 there was a summit meeting, at which President Yeltsin and President Clinton signed a "Joint Statement of Principles for the Management and Disposition of Plutonium Declared to be no Longer Needed for Defense Purposes," which stated the intent of the two sides to negotiate an intergovernmental agreement to govern implementation of management and disposition of 50 tons of such plutonium from the U.S. and Russia.

Taking as the point of departure the Joint Statement of the Presidents of Russia and the U.S., the sides have held bilateral consultations on an appropriate intergovernmental agreement.

The sides have reached agreement that cooperation will likely require long-term financial support by the U.S. and the international community in all agreed stages of carrying out the work and that the agreement cannot be implemented in the absence of funding. The U.S. and Russia are seeking to arrange such financial support.

The Russian side noted that the Russian Federation is prepared, as its contribution to the cooperation, to make available floor space of industrial facilities under construction, infrastructure, existing technologies, specialists, and every sort of electric power supply, transportation, and other services.

The Russian side emphasized that in the process of cooperation on plutonium disposition, the 24 July 1998 intergovernmental Agreement on Scientific and Technical Cooperation on the Management of Plutonium Taken from Nuclear Military Programs must be fully implemented.

An important issue for the future Agreement will be the issue of determining the transparency measures that must be implemented at both U.S. and Russian plutonium processing enterprises. The sides have agreed that the issue of transparency of the process of disposing of plutonium warrants thorough discussion in the course of future talks.

### **3. Cooperation on the construction of the Fissile Material Storage Facility (FMSF) Derived from the Destruction of Nuclear Weapons and related transparency measures.**

In the period after the 10th Session of the Commission, work continued on implementing the Agreement between the Ministry of the Russian Federation for Atomic Energy and the U.S. Department of Defense Regarding the Provision of Materials, Training and Services in Connection with the Construction of a Safe, Secure, and Ecologically Sound Storage Facility for Fissile Materials Derived from the Destruction of Nuclear Weapons (2 September 1993).

The last session of the Joint High-Level Executive Group for Implementing the Agreement in Washington met from 9-11 November 1998 and reviewed the status of the work and funding of the construction of the storage facility. The sides noted that all work on the construction of the storage facility and fabrication of the equipment for it is proceeding in accord with the agreed timetables.

At the present time, the roof is being installed and insulated. It is expected that the overall construction work will be completed in 2002. Orders for the technical equipment are being placed and manufacturing has begun. The U.S. side is fully performing its obligations and has supplied the casks for storage of fissile material in the first section of the storage facility.

The sides agreed on the text of a document to extend the Agreement for 5 years and to set the maximum scale of funding provided by the U.S. side for the construction of the first section of the storage facility at the level of up to \$412.6 million.

On 27 January 1999, the Agreement on the Construction of the FMSF at the Mayak P.O. was extended from 2 September 1998 by a period of 5 years.

The sides have focused major attention on developing an agreed text of the Transparency Protocol to the Agreement between the Department of Defense of the United States of America and the Ministry of the Russian Federation for Atomic Energy Concerning the Provision of Materials, Services and Training Relating to the Construction of a Safe, Secure and Ecologically Sound Storage Facility for Fissile Material Derived from the Destruction of Nuclear Weapons of September 2, 1993 and on discussing the related Annex.

#### **4. Trilateral Initiative.**

An important step in implementing the statement the President of Russia made in April 1996, and the statement the President of the U.S. made in September 1993 on using IAEA monitoring in regard to weapon-origin fissile materials, was the meeting of U.S. Secretary of Energy Bill Richardson, Russian Federation Minister of Atomic Energy Yevgeniy Adamov and Director General of the International Atomic Energy Agency (IAEA) Mohammed El Baradei at Vienna on 22 September 1998 to review the progress achieved under the joint initiative undertaken by their predecessors two years ago, with the aim of studying the technical, legal and financial issues involved with the IAEA verifying that fissile material of weapon origin declared as no longer needed for defense purposes remains removed from weapons programs.

Substantial progress has been made over the past two years in the area of solving the technical problems involved with the IAEA inspecting the classified forms of plutonium that might include nuclear weapon components under the Trilateral Initiative. The three sides have worked out concepts that would enable the IAEA to make important and independent conclusions when verifying the containers holding such materials without getting access to classified information which could reveal secrets of the construction or manufacture of nuclear weapons.

These concepts will soon be tested using prototype equipment, which will lead to development of the specialized instruments the IAEA needs to conduct inspection activities at the designated facilities. In conjunction with the potential of integrated monitoring systems these measurements within the inspection framework will enable the IAEA to conclude that the weapons-grade fissile materials presented for verification remain permanently removed from nuclear weapons programs.

The abovementioned inspection arrangements accord with the obligations of the Russian Federation and the United States flowing from articles I and IV of the Treaty on the Non-proliferation of Nuclear Weapons (NPT).

In 1997-98 technical seminars were held at the Lawrence Livermore National Laboratory, the Obninsk Institute of Energy Physics, the Savannah River Site and the IAEA central offices. This year it is planned to conduct additional seminars with the aim of discussing how the proposed methods will allow making confident conclusions from the results of the inspections without revealing classified information, and also with the aim of working out approaches to conducting the inspections at the specific facilities designated by the United States and the Russian Federation.

The sides have indicated that in 1999 two seminars are to be held with the participation of technical experts of Russia, the U.S. and the IAEA at two enterprises of the Minatom of Russia: at Arzamas-16 and the Mayak P.O., and two seminars at U.S. Department of Energy facilities.

## **5. U.S.-Russian cooperation on material accounting, control and physical protection.**

The Ministry of Atomic Energy and the Department of Energy are working together at many locations throughout the Russian Federation.

Thanks to the achievement of the cooperative program, the level of safeguards, security, accounting and control of nuclear materials has been raised in Russia; the sector has established centers for training Russian personnel; a modern normative-legal basis has been established, as well as a Federal MPC&A information system.

Further, the U.S. Nuclear Regulatory Commission has provided assistance to the Russian Federal Nuclear and Radiation Authority (Gosatomnadzor) in the development of regulations, and the development of licensing and inspection programs.

The positive results the sides have achieved so far give grounds for an expansion of this cooperation, aimed at countering illicit trafficking in nuclear materials. This program is referred to as the Second Line of Defense.

In September 1998, the Agreement between the Minatom of Russia and the U.S. Department of Defense on Accounting, Control and Physical Protection expired. Negotiations on a new agreement between DOE and Minatom are underway. Currently, the U.S. and Russian delegations have, for the most part, agreed on a text of the intergovernmental agreement, with the exception of the provisions on taxation and liability.

In 1998, the sides agreed to discuss the implementation of materials protection, control and accounting (MPC&A) measures at all relevant facilities, sites and transportation links where HEU will be handled or processed for the core conversion project. The American side stressed the need to continue the ongoing MPC&A cooperation relevant to the core conversion project. This cooperation is expected to eventually fall within the framework of the MPC&A Agreement currently under negotiation.

### **5a. Consolidation of nuclear materials.**

At this time, many enterprises in Russia have accumulated a great amount of Uranium-bearing materials in the form of prototypes of various fuels and fuel composites, cores, assemblies and scrap. Most of the enterprises are undergoing conversion and are engaged in work that does not involve using highly-enriched Uranium.

In addition, the nuclear materials at the enterprises require substantial efforts to provide safeguards, adequate physical protection, accounting and control of these materials under today's conditions.

The most effective means of improving the protection of Uranium-bearing nuclear materials is

to concentrate them in one of the protected places, in conjunction with changing them to a type suitable for the application of modern technologies of accounting, control and physical protection of nuclear materials.

In Moscow in February 1999 there was a meeting of technical experts participating in U.S. Department of Energy and Russian Minatom organizations to discuss the areas and forms of cooperation on consolidating nuclear materials.

From the conclusions of that meeting a joint Russian-U.S. group is working up proposals, which will be submitted for consideration to Minatom of Russia and the U.S. Department of Energy.

## **6. Convention on the Physical Protection of Nuclear Materials.**

The Convention on the Physical Protection of Nuclear Material (IAEA Document INFCIRC 274/Rev.1) was signed by the Soviet Union on 22 May 1980, ratified on 25 May 1983, and entered force on 8 February 1987. As an international agreement the Convention is part of the legal system of the Russian Federation.

The U.S. side proposes to revise the 1980 Convention on the Physical Protection of Nuclear Material, to include expanding its scope, recognizing international standards for physical protection, and providing for international peer reviews in this field. The U.S. believes these modifications will strengthen international cooperation on physical protection.

Meanwhile, the Russian side doubts the expediency of revising the Convention on the Physical Protection of Nuclear Material. Russia has noted several things; in particular, that the Convention on the Physical Protection of Nuclear Material and the IAEA recommendations "The Physical Protection of Nuclear Material" are the basic international documents in this field, used by a great number of countries to develop and upgrade physical protection. The participants in the Moscow Nuclear Safety Summit (April 1996) acknowledged the need for all countries to accede to the Convention on the Physical Protection of Nuclear Material and called upon all countries to accede to it. The Russian side maintains that the countries participating in the Convention will hardly find the proposed change--the creation of an international control mechanism on the physical protection of nuclear weapons--acceptable considering the sensitivity of the information in this field.

The sides have agreed to continue consultations.

**7. Cooperation on implementation of the Agreement between the Government of the United States of America and the Government of the Russian Federation Concerning Cooperation Regarding Plutonium Production Reactors (23 September 1997) and the Agreement Concerning Modification of Russian Commercial Plutonium Production Reactors (September 1997).**

The U.S. and Russian sides, for the purpose of implementation of the Agreement, successfully carried out background visits in 1998 to decommissioned Russian and U.S. reactors and agreed on procedures and technical methods of gaining assurance that the Russian and American reactors will never renew their operation.

At the last meeting of the Joint Implementation and Compliance Commission (JICC) the sides agreed to organize initial observation visits to plutonium storage facilities, under the purview of the Joint Commission, by U.S. observers to Seversk and Zheleznogorsk in early 1999.

During these visits the observers of the U.S. and Russian sides will carry out part of all provided observation activities. Procedures and equipment for the remaining part of observation activity are subject to agreement by a session of the Joint Implementation and Compliance Commission, taking into account the results of discussion between the sides during the initial observation visits.

From the 20th-23rd of October 1998, a discussion took place regarding preliminary estimates of expenses and distribution of financial commitments for implementation of the Agreement Between the Department of Defense of the United States of America and the Ministry of the Russian Federation for Atomic Energy Concerning Modification of the Operating Seversk (Tomsk Region) and Zheleznogorsk (Krasnoyarsk Region) Plutonium Production Reactors.

As a result of this discussion, the Russian side reached a preliminary cost estimate of expenses for the implementation phase of core conversion to be \$298 million.

So far no decision on the question of the scale of U.S. financial assistance has been reached. Nevertheless, both sides have confirmed their intention to continue discussion to reach an agreement on the volume of project work and sharing of financial commitments.

The sides recognized that financial issues are holding back work to be carried out by Russia. In particular, one major project milestone has been delayed. These delays may potentially jeopardize the achievement of the negotiated deadline for halting production of weapons-grade plutonium by December 31, 2000. The cities and industry in the surrounding areas cannot be left without heat and electric power.

Both sides take note of the successful negotiation of an implementing arrangement between the U.S. Nuclear Regulatory Commission and Gosatomnadzor to enhance regulatory oversight of core conversion activities

The U.S. remains interested in the possibility of using LEU fuel for the converted cores in the future, but does not want the choice of fuel type to delay the conversion of the reactors. The Russian side is willing to cooperate fully on studying the feasibility of LEU fuel, in principle, to use it in the converted reactors, but has expressed the need for the U.S. to fund these additional efforts. The U.S. has agreed to bear the cost of the additional tests and analysis required to determine jointly whether an LEU core option should be implemented.

#### **8. Agreement between the Government of the United States of America and the Government of the Russian Federation on Implementation of the Nuclear Cities Initiative.**

On September 22, 1998, an Agreement between the Government of the United States of America and the Government of the Russian Federation on Implementation of the Nuclear Cities Initiative (NCI) was signed. NCI is a joint program between DOE and Minatom that will work in the ten closed nuclear cities to promote economic diversification and community transition. Program objectives include: job creation, scientist and worker retraining, and promotion of commercial activities in the communities.

The first session of the Joint Coordinating Committee was held, and measures were set forth on implementation of the present Agreement.

The U.S. side has allocated \$15 million for implementation of projects under the Agreement in 1999. Currently, Minatom is working on forming a package of projects which can be financed under the Agreement. It was also noted that an important task for implementing the Agreement is to attract private investment to achieve the projects under the Initiative.

The Russian side noted that before NCI started a significant amount of economic and technical work had been undertaken to identify some commercial projects. These projects are priorities to be supported by the NCI initiative.

Initially, the program will concentrate its efforts in three cities: Sarov, Snezhinsk and Zheleznogorsk. Working groups have visited each of these three cities and identified promising projects. One of the primary aims of our mutual effort will be to establish a business friendly infrastructure within the cities. As a start, in 1999, almost \$2 million in funding will be devoted to upgrading the telecommunications systems and to establishing business development centers to promote market-based economic activity within each community.

In Snezhinsk (Chelyabinsk-70), we have identified a pharmaceutical packaging project on which we can work together, leveraging resources to support this important activity to benefit public health and welfare. The packaging project has the potential to employ initially up to 25 people. In Zheleznogorsk (Krasnoyarsk-26), the U.S. working group team has just completed its evaluation. The Silicon of Siberia project, which alone could result in the creation of 500 jobs over four years, will be one target of joint development, with other smaller projects currently being identified.

Agreement has been achieved to create the Open Computer Center at Sarov. Finalizing this project will make possible jobs for over 100 scientific and technical staff in developing software for commercial use. We have made good progress in the six short months since the NCI Agreement was signed and we look forward to building a foundation of cooperation that will lead to sustainable job creation in the closed nuclear cities.

**9. Cooperation under the Agreement on Exchange of Technical Information in the Field of Safety and Security of Nuclear Warheads (1994).**

In the Final Document of the 10th Session of the Commission it is stated that the Agreement represents a unique and effective mechanism for exchange of technical information relating to safety and security of nuclear warheads.

The primary advantage of this mechanism consists in its ability to involve the respective specialists of both sides in work of such importance. Projects carried out in the framework of U.S.-Russian cooperation in the field of safety and security of nuclear warheads demonstrate an effective, timely and rational use of limited resources.

The sides positively noted the projects completed by technical specialists in the process of technical exchange under this Agreement and established that specific plans should be developed in the framework of the corresponding technical working groups and submitted for approval by the Coordinating Group.

The status and outlooks of projects under the present intergovernmental Agreement will be heard at the meeting of heads of technical working groups and reported at the expanded session of the Steering Committee to take place in the first half of 1999.

In addition to cooperation under the above agreement, there has been ongoing laboratory-to-laboratory cooperation in the area of warhead dismantlement transparency. This cooperation, however, was stopped in September of 1998 due to the lack of a legal umbrella for the cooperation. In December 1998, the American side stressed the opinion that the Agreement on the Exchange of Technical Information in the Field of Nuclear Warhead Safety and Security would provide an appropriate framework for the lab-to-lab cooperation. Both sides agreed to pursue rapid extension of the Agreement for an additional 5 year period.

From November 16-18, 1998 another round of U.S.-Russian consultations to examine the status and perspectives of bilateral scientific and technical cooperation on the exchange of technical information in the field of safety and security of nuclear warheads under the CTBT took place in Vienna (Austria).

At the meeting it was noted that during the past two years, a series of joint scientific and technical seminars has been held, and a series of projects has been carried out within the framework of interlaboratory cooperation and of other joint programs furthering the ensuring of safety and security of the nuclear arsenals of each of the sides, the maintenance of confidence in

the competence of the people who service them under the CTBT, and the development of technologies of monitoring and verification of this Treaty.

The cooperation of working groups and experts on the CTBT is taking place with the active and mutually beneficial participation of the leading nuclear laboratories and other agencies of the U.S. and Russia.

The working groups have discussed the results of their activity for 1996-98 and have made more precisely-defined and corrected plans and prospective topics for cooperation in the period 1999-2000.

#### **10. Role of supercomputers.**

Within the framework of the Commission on Economic and Technological Cooperation, the Russian side has repeatedly raised the question of U.S. restrictions on export of high performance computers to Russia. At the same time, the Russian side has concern about the U.S. development of supercomputers.

In this connection, Russia has also repeatedly raised the question of cooperation with the U.S. in the area of computer modeling and experimental studies using powerful laser facilities. However, the Russian side noted that these proposals have remained unanswered.

#### **11. Management of spent nuclear fuel from general purpose submarines (SSN) and nuclear-powered strategic missile submarines decommissioned from the Russian Navy.**

In 1998 and early 1999, the sides held consultations to clarify the future scope and framework of cooperation on management of spent nuclear fuel from nuclear-powered strategic missile submarines (SSBN) decommissioned from the Russian Navy.

Subject to appropriations and agreement on certain conditions, the U.S. government is ready to finance processing fuel from 15 SSBNs. This initiative is intended as an interim bridging measure for a term up to the year 2001 to keep the SSBN dismantlement on schedule. Both sides are committed to implementing dry storage as soon as possible. The sides agreed that the removal of reactor cores from SSBN and SSN submarines and subsequent safe storage are priorities. The Russian side continues to encourage reprocessing of the spent fuel.

Minatom of Russia draws the attention of the U.S. to the problem of the disposition of general purpose submarines (SSN) and of the need for financial assistance to address this problem because the continued maintenance of the vessels afloat poses a clear ecological danger. The sides agreed to form a joint working group to review the broad range of SSN problems and prepare recommendations, according to order of priority and fiscal constraints, for future projects.

## **12. Cooperation in the Area of Establishing a Crisis Situation Center.**

In September of last year, during the IAEA meeting in Vienna, Minister Adamov and Secretary Richardson verbally agreed to study the potential possibilities of cooperation to develop a Minatom crisis center. In March 1999 in Washington there was a meeting of representatives of the U.S. Department of Energy's Office of Emergency Management Operations Center and the Minatom Crisis Situation Center, during which there was an exchange of information about the concept of a crisis center and its organization. Minatom of Russia applied to the Department of Energy for cooperation in designing an analogous Minatom center. The U.S. side agreed to review preliminary equipment lists and an updated planning schedule from the Russian side which is to be provided in the nearest future.

The initial objective is to organize the work of the crisis center in an observation mode so that it can begin its activity at the end of the current year. Additional capabilities will be added over the course of subsequent years.

Minatom and the Department of Energy are working out a special organizational structure for this cooperation.

## **13. Treaty on Banning the Production of Fissile Materials.**

For some time both sides have been calling for opening negotiations at the Conference on Disarmament to develop a multilateral agreement or treaty on banning the production of fissile materials for weapons or other nuclear explosive devices.

Russia and the U.S. have already ceased production of such material.

The sides noted that there is agreement in some areas but that there also remain important differences on major provisions of the future treaty, and underscore the need for further consultations.

## **COOPERATION IN THE FIELD OF NUCLEAR POWER AND TECHNOLOGY**

### **1. Cooperation in the field of peaceful use of atomic energy is regulated by the Agreement Between the U.S.A. and the U.S.S.R. on Scientific and Technical Cooperation in the Field of Peaceful Uses of Atomic Energy of June 1, 1990.**

The term of the Agreement was twice extended, first until June 1, 1997, then until December 1, 1998. Currently the term of the Agreement has expired. Both sides note the importance of this agreement to continued cooperation in the area of nuclear safety and work is underway to extend the life of the agreement for another five years.

Under the framework of the intergovernmental agreement, there are now four memoranda in force that were extended on 9/16/1996 for 5 years, independently of the term of the Agreement:

- concerning cooperation on restoration of the environment and management of radioactive wastes,
- cooperation in the field of research on fundamental properties of matter,
- in the field of controlled thermonuclear synthesis with magnetic confinement of plasma,
- in the field of civilian nuclear reactor safety.

Minatom again underscored that it believes it is necessary to begin preparation of a new agreement reflecting the realities of Russian-U.S. cooperation in the field of peaceful uses of atomic energy and an agreement on "nuclear cooperation" covering U.S.-Russia cooperation in the field of nuclear materials and technologies.

**2. Agreement Between the Governments of the R.F. and the U.S. Concerning Operational Safety Enhancements, Risk Reduction Measures and Nuclear Safety Regulations for Civil Nuclear Facilities, signed December 1993 for a period of 5 years.**

The intergovernmental Russian-U.S. Agreement Concerning Operational Safety Enhancements, Risk Reduction Measures and Nuclear Safety Regulations for Civil Nuclear Facilities in the Russian Federation was signed on 16 December 1993 in the framework of the so-called Lisbon Initiative.

Cooperation between the U.S. and Russia on implementation of the Agreement is being carried out in such directions as development of operational procedures in emergency situations, delivery of full-scale analytical simulators and personnel training, delivery of fire safety equipment, delivery of emergency water supply systems and safety parameter display systems, transfer of maintenance technologies, establishment and equipping of emergency response facilities at nuclear power plants, performance of comprehensive safety assessments of specific nuclear power plants, development of decommissioning strategies with consideration of the particulars of specific nuclear power plants, improvement of standards and rules of nuclear and radiation safety and to strengthen GAN as Russia's independent nuclear regulatory authority. All of the NPPs of Russia have been engaged in implementing International Nuclear Safety Program (INSP) projects.

Within the INSP framework cooperation on transfer of technology continues to develop. Successful development of projects aimed at technology transfer would lead to the establishment of joint production capabilities to improve the safety of Russian NPPs with high quality equipment.

Cooperation under the agreement promotes improved safety of nuclear power reactors and enables Russia to upgrade its NPPs with modern equipment and materials necessary to conduct reactor safety analysis as well as to increase the professional level of plant operators and

maintenance personnel. Both sides note the importance of the agreement for the continuation of cooperation in the area of nuclear safety. Work is being done to extend the agreement for five years.

### **3. The Year 2000 Problem (Y2K).**

The importance of this problem was noted, inasmuch as disruptions in the operation of computers, especially those of the older generation, in 2000 could lead to serious problems for atomic power plants all over the world.

The Russian side has informed the U.S. that at the present time a set of measures on the Y2K problem are being taken at all nuclear-hazardous facilities of the Minatom of Russia, including NPPs. The U.S. and Russia are working together closely on Y2K issues at our reactor sites and have held two international conferences in Moscow in January and February 1999. Note has been made of the usefulness of cooperation between Russia and the U.S. in the area of solving this problem.

Both sides agreed that technical exchanges of experts and visits to NPP are to become an important tool in the expansion of cooperation to address Y2K compliance.

Considering the importance and comprehensive nature of this problem the Nuclear Energy Committee and Defense Conversion Committees of the US-Russian Commission on Technical and Economic Cooperation agreed to share information on this issue.

### **4. Cooperation under the Joint Statement on Establishing International Nuclear Safety Centers.**

The Ministry of the Russian Federation for Atomic Energy and the U.S. Department of Energy note with satisfaction that the International Nuclear Safety Centers established in Russia and the U.S. are working and cooperating. Work is under way on projects of joint research in the field of nuclear safety under the Program. This program was intended for use by Russian and U.S. researchers in their work aimed at supporting and improving the safety of nuclear reactors in the world.

The objective of this Program of joint research in the field of nuclear safety is to achieve a long-term and open exchange of technical information between Russia and the U.S. to improve the technology and culture of nuclear safety in both countries. An effective means to achieving this objective is to conduct high-quality joint research projects, yielding knowledge and information that could be extensively used to support and upgrade reactor safety. A large part of these activities are aimed at improving understanding of the physical principles and scientific facts lying at the basis of the technical aspects of nuclear safety.

Russia and the U.S. expect that the results of the knowledge and information gained will reinforce the position of both countries in the world community in the field of nuclear safety, and can be used to further improve the operation, technical maintenance, safety assessment and nuclear regulatory practice at NPPs in both countries. It is expected that this experience will also prove useful to other countries developing nuclear power.

The Ministry of the Russian Federation for Atomic Energy and the U.S. Department of Energy affirm the significance of the activities being conducted by the Centers and their readiness to support the Program of Joint Research of the Russian and U.S. Nuclear Safety Centers in the field of nuclear safety. This Plan is included as an attachment to this report of the Nuclear Committee.

This program will serve as a guideline in the future joint activity of the centers. Also, the Russian Center jointly with the U.S. Center in cooperation with the OECD is developing a Strategic Plan of Safety Research for Russian NPPs.

The activity of both Centers, including activity under the International Nuclear Safety Program, is furthering the enhancement of safety culture and the dissemination of information on the efforts of both governments in this area.

#### **5. International Center for Environmental Safety.**

Following the commitments made last September in Vienna by Secretary of Energy Richardson and Minister of Atomic Energy Adamov, the sides have agreed to establish International Centers for Environmental Safety. The center will be established as an independent entity within the Ministry of the Russian Federation of Atomic Energy, Moscow, and the U.S. Department of Energy, Idaho Falls, Idaho (the Idaho National Engineering and Environmental Laboratory and Argonne National Laboratory).

The primary task of the centers will be joint work on solving ecological problems related to the effects of nuclear activity on the environment and performing effective restoration activities to improve the state of the environment. Planned within the framework of the Centers are the development of economically viable environmental protection technologies and systems, radioactive waste and spent nuclear fuel management strategies, decontamination of decommissioned nuclear facilities and nuclear-powered submarines, and the development of technologies for decontamination and restoration of soil, water and construction materials.

Cooperation at the Center will be carried out by conducting joint research and design work, performing experimental studies, technology demonstrations and exchange, and training of specialists.

All these activities are to further the enhancement of environmental security and preservation of the environment.

The Center's activity will be carried out strictly in accord with commitments of the U.S. and Russia under the Nuclear Non-proliferation Treaty and other international and bilateral agreements in the area of peaceful use of atomic energy and in coordination with existing international activities in these areas outlined above. It was further agreed that support for the Centers would be carried out on a parity basis.

The signing of the Joint Statement Concerning the Establishment of an International Center for Ecological Security in the U.S. and Russia is to take place at this session of the Commission.

#### **6. Cooperation in the field of geological isolation of radioactive waste and spent nuclear materials of various origins.**

The consultation held in December 1998-January 1999 between the Minatom of Russia and the U.S. Department of Energy on topics of cooperation in the field of geological isolation of radioactive waste acknowledged the expediency of beginning the preparation of a draft of an appropriate intergovernmental agreement.

The major areas of cooperation under this Agreement could be:

- research on the feasibility of safe geological isolation of radioactive waste and spent nuclear materials obtained from military and civilian activities;
- research in underground laboratories to demonstrate the safety of isolating radioactive waste in geological formations;
- establishment of prototype production facilities, including technical-economic studies, design, feasibility studies for geological areas, safety analyses and environmental impact assessments.

The Minatom of Russia has sent the U.S. Department of Energy its proposals on the draft agreement.

The sides agreed to set up a working group to examine the issue. The results of the report are to be submitted to the Committee Co-chairs by the fall of 1998. The working group is headed by Minatom First Deputy Minister, V.B. Ivanov, from the Russian side, and DOE Under Secretary Ernest Moniz from the U.S. side.

#### **7. International Project for an Inherently Safe Nuclear Fuel Cycle.**

Both sides discussed Russia's concept for establishing an inherently safe nuclear fuel cycle free from flaws found in the current nuclear fuel cycle. This new fuel cycle, according to the Russian side, is important both in terms of nonproliferation and nuclear safety, as well as for the future development of the nuclear industry.

The Russian side urged the American side to support its initiative to organize an international project in order to pursue development of an inherently safe nuclear fuel cycle. The Russian side noted that countries which are experiencing rapid economic development, and have the intention

to use nuclear power as a source to satisfy their growing energy needs, could be potential customers for this new type of reactor. The Russian side also noted that involvement of these countries could be conducive to the resolution of nonproliferation issues.

The U.S. expressed its intention to explore issues surrounding the development of small, inherently safe and proliferation resistant small reactors and related fuel cycles.

#### **8. Cooperation on reducing enrichment level of research reactor fuel.**

Progress in cooperation on this problem has been made. It is expected that in the next three to five years work will be completed on the creation of a new type of fuel. Reactor tests on existing types of fuel and development of new high-density fuel types give grounds for optimism.

Currently, tests have been started on new experimental fuel elements and fuel assemblies with uranium enrichment of less than 20% at several Russian research reactors.

A working group for this problem has been formed, comprising U.S. and Russian specialists, and three meetings of the group have already taken place, showing that the sides intend to continue and develop cooperation with a view to completely avoiding the use of highly enriched uranium in civilian programs in the future.

#### **9. High Temperature Gas Cooled Reactors.**

The Experimental Design Bureau of Mechanical Engineering (OKBM), with participation of Russian Research Center "Kurchatov Institute", Luch NPO (Scientific Production Association), the All-Russian Scientific Research Institute of Inorganic Materials (VNIINM) and the Siberian Chemical Combine (SCHE) in Seversk, from October 1995 started to develop a conceptual design of a gas turbine modular helium reactor (GT-MHR).

To evaluate the feasibility of using a GT-MHR for utilization of plutonium, it is necessary to complete and implement a gas-cooled reactor design itself, as well as to create a fuel production facility. At this time, a conceptual design of a GT-MHR has been developed, and a laboratory facility for production of fuel from weapons-grade plutonium has been created and is being operated.

For the year 1999 the U.S. Congress has appropriated \$5 million for continuation of work on the GT-MHR project. Of this amount, \$3 million, with parity financing by the Minatom of Russia, is to be spent in Russia. Under the Agreement on Scientific and Technical Cooperation on] Plutonium Disposition a working group has been formed to prepare plans for the design of such a reactor. This plan is expected to be completed in April.

## TECHNICAL AND ECONOMIC COOPERATION

### **1. Nonproliferation and Export Control Issues.**

The U.S. and Russia agree on the importance of nonproliferation objectives in carrying out peaceful nuclear cooperation with other countries, which must be pursued in strict compliance with the provisions of the international nuclear nonproliferation regime. They will use the Nuclear Committee to strengthen their cooperation and consultations aimed at resolving mutual nonproliferation concerns, and will work actively together as well as with additional countries to strengthen implementation of the international nonproliferation regime. Both sides reaffirmed their support for the "Principles and Goals of Nuclear Nonproliferation and Disarmament," adopted during the Review and Extension Conference of the Nonproliferation Treaty.

At the same time, the Russian side believes it is feasible to draw developing countries more actively into this cooperation.

Both sides will use the Nuclear Committee, established under the framework of the Commission, to strengthen their mutual nonproliferation cooperation, and to pursue consultations and seek resolution of mutual concerns in this area.

Cooperation on export control between Russia and the U.S. is now under way in the framework of government-to-government Russian-U.S. expert groups (seven in number) on export control and on the basis of the Memorandum of Cooperation in this field signed in January 1994, and also at the inter-ministerial level between the Minatom of Russia and the U.S. Department of Energy under the "Letter of Intent on Cooperation in the Field of Export Control" signed in September 1996.

In the framework of the expert groups on control issues in the nuclear field there is a discussion of issues of export control procedure in this field, transfer of nuclear technologies, including in unrecognizable form, and other problems involved with the export of nuclear materials and technologies.

### **2. Activity of the Russian American Fuel Cell Consortium (RAFCO).**

The RAFCO Agreement was signed by the Minister of the Russian Federation for Atomic Energy and the U.S. Secretary of Energy in September 1996.

The activity of the Consortium has produced certain positive results. First of all, a fruitful cooperation between institutes of the Minatom of Russia and U.S. national laboratories has been established, as well as cooperation of these institutes and laboratories with the industrial sectors of the Russian Federation and United States of America.

At this time, there are eight RAFCO projects at various stages of implementation with an overall scale of funding of \$2.7 million (of which the Russian institutes' share is \$1.4 million). In

the framework of these projects, very important scientific and technical problems are being resolved, determining the movement to market of promising power technologies based on fuel elements.

Joint efforts on implementation of projects has allowed partner relations to be established and a logic of joint development and marketing of fuel element technologies to be worked out.

These efforts consist in the sequential progress through the following stages: conducting joint R&D work on key elements of the technologies, demonstration and testing of available technologies, selection of the most promising prototypes of power plants based on fuel cells, and organization of joint production thereof.

The immediate tasks of RAFCO for both sides are:

- Expansion of the sources of financing of R&D Projects and Demonstration Projects to include third-party states, the World Bank and U.N. resources,
- Establishment of joint Russian-American plants (enterprise)
- Cooperation with Conversion and Environment Committees of the Commission on Economic and Technological Cooperation.

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OF THE UNITED STATES  
OF AMERICA**

**MINISTER OF THE RUSSIAN  
FEDERATION FOR ATOMIC  
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