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The Nuclear Industry in Russia

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In this presentation I am going to dwell on five issues: natural uranium production; uranium enrichment; spent fuel reprocessing; Russian nuclear power plants; and the “contract of the century”, the high enriched uranium (HEU) to low enriched uranium (LEU) contract, by which we are converting megatonnes of nuclear explosive into megawatts of electricity.

Natural Uranium Production

After the formation of the Commonwealth of Independent States (CIS), only one enterprise for uranium mining was left on the territory of the Russian Federation. This is the Priargunsky chemical mining enterprise. At present 2500 tonnes of uranium are being mined at this enterprise per year. This is approximately one-fifth of what was being mined in the USSR. Russia is now using the stockpile of uranium that was produced in previous years. Annually, for internal use and for export, we are using about 11 000 tonnes of natural uranium. So we are very actively reducing the state stockpile of this material.

Minatom has developed a conceptual programme, which is a federal Russian programme, to increase uranium production in Russia over the forthcoming fifteen years. The already-known deposits of natural uranium in Russia are about 500 000 tonnes. In accordance with the programme we have developed, we plan to be mining 11 000 tonnes of uranium by 2010, from deposits in the South Urals, Western Siberia, and in the area east of Lake Baikal (the Buryatskaya Republic and Chitinskaya Oblast). The programme is being implemented today and I have no doubt that it will be successful

in the end.

As for the Priargunsky chemical mining plant, we believe we can reach a production level of 3500 to 4000 tonnes a year, by using the leaching mining method.

Uranium Enrichment

Russia is using the centrifuge enrichment method, and our total capacity is about 20 million SWU per year. For a person who is not a specialist it is hard to understand what a SWU really is, but SWU exist so we cannot do anything about it! We have started to install a new generation of centrifuges, in fact the seventh generation, at our plants. The cost-effectiveness of these centrifuges is 30% higher than that of those that are already in operation at our plants.

Russia believes that for the forthcoming 50 years the most effective method for uranium enrichment will be that using centrifuges. Today our enrichment capacity is practically 95% loaded, which is mostly due to the fact that we are now in the process of producing LEU from enrichment tails for blending with the weapons-grade HEU.

Spent Fuel Reprocessing

This is the most acute problem for the entire nuclear industry worldwide, including those using radionuclides in different industrial techniques and medical applications. We are developing several projects for regional storage facilities for spent fuel. However, our basic policy is to have a closed nuclear fuel cycle, meaning we will reprocess the fuel. Unfortunately, so far humanity has not learned how to effectively use the radioisotopes in the

spent fuel, so we vitrify the waste that remains after reprocessing. We are looking at several areas to locate regional repositories for such wastes, including the Kola Peninsula region and the nuclear test site on the Novaya Zemlya Island.

We fully support the international project which has just started, which is becoming a good project, called the "Atoll" project. The essence of the project is to create a repository on one of the atolls in the Pacific Ocean. The project will be based on the leasing idea, ie. where the fuel is leased to the utility and is taken back after use and stored on the atoll, and maybe even reprocessed in the future.

As for fresh fuel, we have now set up a joint venture, unfortunately it is only one joint venture, with the German company Siemens to manufacture new types of fresh fuel. I am pretty sure that in the twenty-first century there will be several large companies manufacturing fresh fuel, especially for countries of the developing world, and also taking care of the spent fuel. We still do not know whether the spent fuel will be taken to one atoll, two atolls, or to several locations, but that certainly seems to be one of the possibilities.

Russian Nuclear Power Plants

We have nine nuclear power plants with 29 units operating in Russia today, producing about 22 gigawatts of electrical power. As was stated at the summit in Moscow in April 1996, a lot has been done in the last five years to upgrade the safety of Russian nuclear power plants, especially of the nuclear power plants of the first generation which have already operated for more than twenty years.

According to data from the World Association of Nuclear Operators (WANO), in 1996 Russia was the third best performer in terms of the number of automatic shutdowns of nuclear power plants. Japan was the best, then Germany, with Russia third; after that came Britain, then Canada and France. We have done so much in upgrading nuclear safety at our NPPs that the number of incidents at our plants has decreased by a factor of 30, and the number of incidents causing automatic trips has dropped by a factor of three.

We received a lot of help and assistance from the world community, especially from countries of the European Union. As you know, under the EU's TACIS programme technical assistance has been provided to upgrade the safety of Russian nuclear power plants. It is interesting to note that while in 1992, 75 million ECUs was spent on this

under the TACIS programme, the amount allocated for 1996 was only 30 million ECUs. This is in spite of the fact that EU-Russia relations have become even better over this period. It is a shame of course to see this contrast between words on the one hand and the reality on the other.

However, I do not want to say that we need any free-of-charge assistance, as we can and we do earn money. For your information, while our export earnings for 1992 were only US\$700 million, in 1996 this figure reached the level of US\$2.2 billion. We are planning to reach the level of US\$3.5 to 4 billion a year by 2000. Of course there is very strong competition in the uranium market, which I have always been against. I think that there should be competition on scientific ideas, but that on the other hand we should unite and try to promote nuclear power to developing countries. This will surely occur and nothing will stop this process.

We have plans to start up three new nuclear power units by 2000. These will be one unit at the Kursk NPP, another at the Kalinin NPP, and another at the Rostov NPP. Each will have a capacity of 1 GWe, so the overall capacity added will be 3 GWe.

Megatonnes to Megawatts

Finally let me turn to the last aspect of this presentation, the deal to turn megatonnes of nuclear explosives into megawatts of electricity, which in Russia we call the HEU to LEU contract. You will remember that Russia has announced that 500 tonnes of HEU, resulting from the dismantlement of Russian nuclear warheads, is no longer required for national security purposes and will be converted into LEU to be used in nuclear power plants.

A corresponding inter-governmental agreement between Russia and the United States was signed, and after that a special implementing contract was also signed. The real process started in 1995, when 6 tonnes of HEU were used (by HEU, I mean uranium which is 90% enriched in the uranium-235 isotope). In 1996, already 12 tonnes of HEU were used, and we are planning for this figure to be 18 tonnes of HEU in 1997, in accordance with our contract with the US Enrichment Corporation (USEC). In accordance with this contract, we will be converting 24 tonnes of HEU in 1998 and then will raise this figure to 30 tonnes in 1999. It will remain at 30 tonnes in 2000 and 2001.

Unfortunately this is a very difficult contract, because it has several aspects. It has a political side to it, by which I mean the issue of transparency,

and also an economic side. I invite everyone to participate in this contract; nuclear disarmament is a very important issue in the life of our planet.

Starting from 1997 the situation is that the feed component of the Russian LEU derived from HEU became the property of the Russian Federation on the territory of the United States, while USEC is delivering to its clients the LEU that it receives from Russia. In accordance with the five year contract with USEC, the amount of this material will be about 40 000 tonnes of natural uranium in the form of UF₆. So that is about 8000 tonnes a year, which represents a wonderful mining project for Russia.

Unfortunately, this is a very strange and peculiar situation. The UF₆ is the property of Russia on the territory of the United States, but Russia cannot take this material back to Russia, although we are delivering LEU to the United States. This is a very important issue for Russia, because we plan to sell part of this material on the world market and to take the remainder back to Russia to replenish our stocks. Recently we have signed a memorandum between Minatom of Russia and the companies Cogema, Cameco and Nukem, which states that they are ready to purchase that part of the material that is intended for sale.

We are planning to sell this material through our agent, which is the well-known company Global Nuclear Services and Supply (GNSS), which is located on the territory of the United States. Our plan is to sell the material on a bidding basis. For example, in 1997 the overall amount of the material is 5400 tonnes. We plan to sell about 5000 tonnes, and leave about 400 tonnes in our special stock. We are not going to sell this latter material, rather we are going to stockpile it so as not to decrease prices on the world market, but to try to increase them.

Of course, I am always sorry to hear when there are dual prices in the world uranium market, when there is one price for material that comes from CIS countries and another price for material from other countries, so called restricted and unrestricted prices. Some of the buyers in the market make use of the difficulties that we now see in the countries of the former Soviet Union to create these double standards in uranium prices. I am sure we can overcome this in the near future, and I will do

whatever possible together with Ukraine, Uzbekistan and Kazakhstan so that we can go together to the world market and offer the unified world price.

The memorandum that I mentioned on the uranium feed component, which was signed at the beginning of August 1997, implies that in the near future there will be an implementing contract signed between the parties. We have already defined the basic principles of that deal for the next ten years. We can guarantee deliveries for the coming five years, since there is already a contract with USEC for that period. Our contract on the feed component for the years from 2001 onwards will depend on whether we will have a contract with USEC or not.

I hope that in September 1997 the implementing contract on the feed component will be signed, so that by the end of the year we can restart deliveries of LEU to the United States, because we are at present falling back from the schedule. However, I had some doubts during my last meeting with representatives from Cameco, Cogema and Nukem, but I hope that they are just behaving a little capriciously, and that they are solid people and we will overcome whatever difficulties there are.

Finally, a few words about the Uranium Institute. This is the fifth time that I have spoken at this well-known and highly respected Symposium, to tell you about the situation in Russia. Of course I would like to encourage the Uranium Institute and all its members to do whatever is possible to promote nuclear power in the world. Personally I am willing to participate in this process, to act as effectively and actively as we have seen Greenpeace doing in recent times.

I am not calling on you to scale the pipes of thermal power plants! But I am sure that the twenty-first century will be the century of nuclear power, and that it will be written in golden letters that the twentieth century was the century when nuclear power was developed. I would like to wish you all luck and good work at the Symposium and to participate actively in this process. This is important, especially for the developing countries, so that everyone can use the benefits of the scientific and technical progress in the field of nuclear power.