

# EIR Science & Technology

---

## Russia, Iran, and Peaceful Nuclear Power

---

*U.S. accusations that the nuclear power plant that Russia is building in Iran will lead to a nuclear bomb, are without scientific foundation. An interview with Russian expert V.I. Rybachenkov.*

---

Vladimir I. Rybachenkov is a Counselor at the Embassy of the Russian Federation in Washington, D.C. He worked for ten years in the Ministry of Foreign Affairs in the nuclear division; has worked closely with the Ministry of Atomic Energy in Russia; and before joining the Embassy staff in October 2003, visited most American nuclear laboratories during 15 visits to the United States over a period of ten years. At the Embassy, he is the Counselor responsible for military political affairs, working on disarmament, nonproliferation, and bilateral cooperation. Mr. Rybachenkov graduated from the Moscow Institute for Physical Engineering, which was created in 1946, just at the beginning of the Russian military nuclear program. There, he graduated from the faculty that prepares specialists in computers and automation for physical experiments. He was interviewed on Jan. 21 at the Russian Embassy by Washington Bureau Chief William Jones, and Technology Editor Marsha Freeman.



nuclear program at the American Enterprise Institute in November. You succeeded in refuting claims that the ideologues there were making with regard to the Russian cooperation on the Iranian nuclear program, much to the chagrin of the organizers. They were obviously attempting to whip up hysteria around the issue.

**Rybachenkov:** I was present during these discussions, which seemed to me to be biased. The speakers—who were political scientists—in order to confirm what they wanted to prove, called upon some scientists from national laboratories to provide some scientific proof that Iran may conduct prohibited activities with spent fuel from their civilian nuclear reactor. There were three panelists. One of them referred to a report of a scientist from Oak Ridge National Laboratory, who was explaining that it is easy to extract plutonium from the spent fuel in the Bushehr nuclear power plant for weapons purposes.

Really, for me, this was not true. There are different reasons why this cannot be done.

First of all, the power plant is under the control of the International Atomic Energy Agency of the United Nations, because Iran is a Nuclear Nonproliferation Treaty participant and has a safeguards agreement with the IAEA. At the present time, about 1,000 Russian engineers and specialists are constructing the Bushehr nuclear power station. The main parts have been delivered, like the turbines, and the reactor itself. The station is to start operation in the beginning of 2005—

**EIR:** I heard your intervention at a forum on the Iranian

a level of nuclear criticality will be obtained—and several months later it will deliver power into the electric grid. From the beginning, the Bushehr plant has been under IAEA inspection, and inspectors regularly come there. This is the first reason why what this panelist was speaking about, cannot be accomplished.

Second, I don't know what the state of things is right now, but two months ago, the Minister of Atomic Energy of Russia was in Washington; and during an interview at the Department of Energy, he said that the signing of a special protocol between Iran and Russia was upcoming, and he thought it will be signed at the end of the last year, or the beginning of this year. It stipulates that the spent nuclear fuel from the Bushehr reactor will be sent back to Russia.

This is extremely important. This is the second reason which will not allow the Iranians to do anything wrong with the spent fuel. It will stay in Russia. It will be up to us to decide whether to reprocess it, or store it for some time. We have special storage in Siberia, near Krasnoyarsk, where it may be kept and well controlled, under surveillance, and guarded. There is no possibility that this material can be stolen in Russia. So this is the second reason why I thought this speaker was not right.

And the third reason, I would say, is from a scientific point of view. Scientists know the difference between military plutonium and civilian plutonium. Military plutonium is a special material. Plutonium doesn't exist in nature. It is an artificial material produced at the end of the chain of nuclear reactions. Military plutonium, specifically that used in nuclear bombs, contains more than 90% of the Plutonium 239 isotope. For the production of this plutonium, a special type of reactor was developed in the 1950s in the U.S. and in the Soviet Union. The U.S. constructed 14 such reactors; and Russia, 13. Today all American military plutonium production reactors are shut down, in places like Savannah River and Hanford.

Our 13 reactors were located in the Urals and in Siberia. We've closed 10 of them, and three will be closed by 2007-08 with American assistance. A special agreement was signed by Minister of Atomic Energy Romyantsev and Energy Secretary Abraham in 2003 in Vienna, by which the American side will help us to construct replacement energy sources, for electricity and the production of heat, using coal or gas. When these new stations are built, the last three Russian reactors will finally be shut down. So special military plutonium production reactors were constructed, and were the only ones producing military-quality plutonium, with a high content of Plutonium 239.

The work cycle of the military plutonium production reactor is very short. The reactor works for two or three months, and excludes the production of other isotopes that are not needed, producing only the needed quality of military plutonium. But if you take a civilian nuclear power station, the



*Iran's Bushehr nuclear reactor, under construction with Russian assistance. Contrary to the claims of U.S. neo-cons who know nothing about physics, it is no easy matter to extract plutonium from the spent fuel in the power plant for weapons purposes.*

traditional work cycle is two, three, or four years; you don't take the fuel out of the reactor until you refuel it. During this long period, which is approximately ten times longer than the process with the military reactors, plenty of other isotopes are being produced, but mainly Plutonium 238. This isotope of plutonium is harmful for the production of nuclear arms-grade plutonium, because it has a very strong spontaneous neutron emission; that is, it produces a lot of heat, so it would be difficult to predict what the yield would be of such a nuclear bomb. You can produce such a bomb, but you have to undertake very serious engineering efforts, using special tricks, because you have enormous heat. You practically have to put this bomb into a refrigerator to assure the dissipation of this heat.

Also, you have to struggle with the flux of neutrons which doesn't allow you to know the exact yield of the bomb. So, no one ever used civil plutonium for the production of a bomb. But this panelist was insisting that the plutonium which will be produced in Bushehr may be separated by Iran and be used for a bomb.

These were my remarks following the speech of this panelist, Henry Sokolski. He was too self-assured. He pretended to know all about these problems, and to present the only truth.

Maybe I took too much time for someone who wanted to make a comment. The lady who I was told is traditionally the organizer of those meetings, stopped me and said, "That's

very interesting but you are speaking too long. We'll try to invite you as a speaker next time."

**EIR:** Have you received an invitation?

**Rybachenkov:** Not yet.

**EIR:** It was very important that you were there. These neo-conservative think-tanks often organize these meetings in order to give their ideological spin on a particular topic, and unless someone is there in the audience who has the facts, people get the impression that what they are saying is true. But as soon as you bring in the facts, they get nervous. We have often enough found ourselves in the position of attending such meetings simply in order to bring in some of the real facts of a topic which the neo-cons have chosen to distort.

**Rybachenkov:** I've never worked before in the United States on a permanent basis. This was my first experience. For me, it was very interesting. I've noted that those panelists were political scientists. They really knew little about physics, or about nuclear arms. To have support, they called for scientists, like this expert from Oak Ridge, who wrote an article about the theoretical possibility of various things which Iran could do to make weapons. So they tried to marry policy with science to show it is a solid approach, and if someone criticizes them, they say, "No, it's not true, because we have the support of these scientists."

**EIR:** Can you say something more generally about the importance of the nuclear reactors for Iran? They are talking about building four more nuclear power plants, I believe. . . . This is important, because the argument of the opponents of building these nuclear plants, is that Iran has so much oil and gas, there can be no possible reason that they want to build nuclear plants, except for the development of nuclear weapons.

**Rybachenkov:** I have heard this argument from some Americans, and I have never agreed with that. I tell them, you in the U.S. have enormous reserves of oil, and at the same time, you have 100 nuclear reactors. There is no reason to criticize a country that has oil, and wants to use nuclear energy. The right to have nuclear energy plants is prescribed in the Nuclear Nonproliferation Treaty. Each non-nuclear [weapons] country has the right to develop peaceful uses of nuclear energy, and has the right to receive assistance from other countries for that purpose.

Article I of the Treaty says the five nuclear [weapons] states do not have the right to transfer the know-how of nuclear arms to non-nuclear states. Article II says that non-nuclear states have an obligation not to receive this know-how, and Article IV says each country has the legal right to develop nuclear energy. So from the point of view of the Treaty, with 180 countries as participants, you cannot criticize Iran.

I think that Iran may be criticized for some nuclear activities which were not sufficiently transparent. They started activities in uranium enrichment, which is not prohibited by the Treaty. But if you have a safeguard agreement with IAEA, you have to report this to the IAEA and give them permission to send in inspectors, to see the purpose of, for example, this uranium enrichment centrifuge plant. Iran started constructing the first line of about 200 centrifuges.

They found a pretext for not reporting it to the IAEA, saying that they've constructed this line of centrifuges by themselves, but they did not use the working material, which is uranium hexafluoride. You can have uranium in metallic form—in a powder—but in this form you cannot enrich it for the uranium you need for electricity production. From a metal or powder, it is transformed into a gas, uranium hexafluoride, for enrichment.

So Iran was saying, "We complied with our obligations because we did not introduce this material into the centrifuge." They were saying they did not have to report it immediately, because according to the IAEA, the uranium enrichment plant has to be reported to them only at the moment of the introduction of this material.

Unfortunately, things got worse. When IAEA inspectors took environmental samples at these centrifuges, they found traces of highly enriched uranium. How could that happen if Iran didn't use the hexafluoride?

The IAEA didn't like the fact that the Iranians were contradicting themselves. First, they were saying the centrifuges were produced in Iran. When the IAEA laboratory discovered the contamination by highly enriched uranium, they said, "We've obtained these centrifuges from a third country; they are not new, but were already used by a third country."

But fortunately, as you know, due to the efforts of the international community, including Russia and the European Union—you remember the visit of the ministers of the United Kingdom, Germany, and France, in October of last year—the Iranians said they would agree to sign this so-called Additional Protocol, which gives the IAEA enhanced capabilities to discover undeclared activities. Iran signed the Protocol in November 2003, and it is in the process of ratification in the Majlis. That may happen in January or February, but they said that even though it is not yet ratified, they will abide by the provisions of the Protocol.

Russia undertook active efforts in this sphere. We've arranged for several visits of high-ranking people from the Ministry of Foreign Affairs to Iran, to explain to the Iranian leadership that it would be to their benefit to have the highest level of transparency of their nuclear program.

During the last meeting of the Board of Governors of the IAEA in Vienna in November, Iran announced the signature of the Additional Protocol, and the Board adopted a very mild resolution. Maybe the Americans didn't like it, since their idea was to put the problem before the Security Council. But



*The United States and Russia have signed nuclear nonproliferation agreements, as in this ceremony in Washington, on Nov. 7, 2003, but the U.S. has refused to renew the joint agreement on peaceful uses of atomic energy, due to Russia's work on Iran's Bushehr nuclear power plant. Energy Secretary Spencer Abraham is on the left, and Russian Minister of Atomic Energy, Alexander Rumyantsev, on the right.*

the mood of most of the Board was that Iran has shown a good level of cooperation.

In addition, the IAEA was not given sufficient time to analyze all of the materials presented by the Iranians to explain their nuclear program; so the Agency needed more time. The Board welcomed the decision of Iran to sign the Additional Protocol, and a resolution was passed to revisit the Iranian problem at the next meeting of the Board of Governors in March. Then, the Board would see what the conclusions are of the Secretariat, which will have had sufficient time to analyze all the materials presented by Iran. This will be a very important meeting.

We'll see how Iran complies with the NPT, and the Additional Protocol. The IAEA leadership will report on their [the Iranians'] behavior towards the inspectors: whether they were able to go anywhere they would like to go; whether they were allowed to take environmental samples. It is only in the Additional Protocol that this measure was introduced, to take environmental samples; and this is very important, to know the story of a facility.

If you have an enrichment plant, and the person running the plant tells you: "I was making enrichment of 3%, 4%, or 5% for a nuclear power plant," it would be very difficult to confirm this. But if you are allowed to take environmental samples, minimum traces of uranium isotopes will be detected, and if someone tried to enrich it more than 10, or 20%, it will immediately be shown by the analysis of the environmental samples. Under the Additional Protocol, access to the facilities is enlarged, more documentation is asked from the Iranians, and it is an important step forward.

As far as Russia is concerned, we are very satisfied with the results obtained. We worked in parallel with the French and Germans, and we agreed that, taking into account the gestures of cooperation which Iran showed, it would be unrealistic to press them and not give them time to explain all of the details that were not yet known.

It is also important to stress, that, *in no case*, can you compare the situation in Iran with that in North Korea. Almost two years ago, North Korea expelled IAEA inspectors, and nobody knows what is going on. They are saying very contradictory things, declaring they have extracted plutonium from the rods. That is why you cannot compare these two cases.

Nobody knows for sure what is happening now in North Korea's nuclear complex. Did they extract this plutonium, and produce several bombs, which they say they need to protect themselves from an aggressive policy of the United States, which put Korea in the axis of evil? Russia is also concerned about the North Korea situation. We think that only a peaceful solution through negotiations can produce a positive result. The D.P.R.K. is very much concerned about their national security, and are afraid of possible military aggression of the United States. That's why they are asking for some kind of security assurance from the U.S. government.

**EIR:** Could you please explain more about the energy situation in Iran? Will the nuclear plants play a vital role there?

**Rybachenkov:** Two years ago, when I was present at the General Conference of the IAEA in Vienna, the head of the Iranian nuclear energy commission, Mr. Gholamreza Aghazadeh, announced a long-term plan of development of nuclear

energy. They want to construct several nuclear blocks during the next ten years, with an overall power of 6,000 megawatts (MW). The reactor which we are building, which is a VVR 1000, is 1,000 MW, so Aghazadeh announced the decision to build an additional five stations.

**EIR:** Do you have a contract to build any of the additional reactors?

**Rybachenkov:** At the moment there is an agreement for the construction of only one reactor at Bushehr. There is a possibility to build another one at the same site. Unfortunately, the United States is very much against the construction of another reactor. They say, "We'll tolerate one but we wouldn't like to have another." Our question is, what is the difference? One block or two blocks? The conditions will be the same: still under IAEA safeguards; the spent fuel will be taken to Russia; so what is the difference? There are some discussions between Russian and Iranian authorities about the construction of additional blocks. They have this long-term plan, which they wish to accomplish.

**EIR:** Are there other ramifications of the disagreement between Russia and the United States over nuclear policy concerning Iran?

**Rybachenkov:** Iran really is a big problem in the relations between Russia and the United States. We still do not have an agreement between the U.S. and Russia on cooperation in the peaceful uses of nuclear power. We had one, but it expired six years ago, and because of concerns of the United States on Iran, they refused to sign another agreement, which hinders our cooperation.

Secondly, Russia had the plan of taking the spent fuel from different countries, such as Taiwan and South Korea, first, to serve nonproliferation purposes. In Taiwan, they really don't have sufficient storage for the spent fuel. But if it were taken to Russia, to Krasnoyarsk, all of the spent fuel containing plutonium would be concentrated in one place, with no risk of anyone trying to separate it. So Russia had the plan of taking a certain quantity of this spent fuel. The price to do this is very high. The storage and processing of one kilogram of spent fuel on the world market costs \$1,000, which means \$1 million per ton. We had the intention of taking 20,000 tons of spent fuel, through which Russia could get \$20 billion, using some of the money to reconstruct the storage. This money could be used mainly for the ecological restoration of Russian territory, for the enhancement of nuclear safety, and so forth.

The problem is that the nuclear fuel being used by South Korea and Taiwan is "American obligated." It belonged to the U.S., so without the permission of the U.S. government, neither South Korea nor Taiwan can send this spent fuel to Russia. The attitude of the U.S. government is that they won't give this permission (while understanding all of the advantages, from the nonproliferation point of view), before all

American concerns about Iran are lifted.

You see how many aspects of the Iran problem you have. It doesn't allow for the signature on an agreement for the peaceful uses of nuclear power, and it hinders bringing spent fuel from other countries to Russia.

**EIR:** The export of nuclear technology is very important for Russia, and we understand that you are developing floating nuclear power plants. . . . We believe if the world is going to develop, and if countries in Asia, Africa, and Latin American are to move forward, they will need a lot of energy, and much of that will come from nuclear.

**Rybachenkov:** You are right, but the official U.S. position is negative, insisting there are proliferation problems.

In Russia we have a very good design for such floating nuclear facilities. The Ministry of Atomic Energy has had negotiations with countries such as Indonesia and the Philippines, to deliver this kind of energy source, using floating nuclear plants. In one case, this problem has been resolved, and I believe one will be delivered to Indonesia. For many years our scientists have been working on this problem, and we have developed a very good design, from the point of view of safety and transportation. The power level of such reactors is about 100 MW per unit.

**EIR:** Is the first unit going to be in Russia?

**Rybachenkov:** We've had some experience with such stations, but no new installations have been produced as of now. It's a question of money. There were people with fantasies, saying that the reactors from submarines could be used for this purpose; but it was decided, from the ecological point of view, not to use them. Most of them are old, they should be dismantled, and Russia is now dismantling the submarines in the North and the Far East.

On the proliferation question, recently Dr. Mohamed ElBaradei, Director General of the IAEA, presented an interesting paper on creating one or several international nuclear spent-fuel storage facilities to avoid the risk of plutonium being extracted by some countries.

**EIR:** But one of his proposals that I find disturbing, is that non-nuclear weapon countries should not be allowed to develop uranium enrichment technology on their own, but that it should be centralized regionally.

**Rybachenkov:** I agree with you. I do not understand this proposal. It may be humiliating for these countries. You have the IAEA safeguard system, and the Additional Protocol. Why wouldn't this country have the right to enrich uranium?

On another aspect of this: On Jan. 12, it was reported in the *Washington Post* that President Bush pledged to help India with its nuclear energy development. I don't understand how this could be done in practice. We in Russia already have had a negative experience cooperating with India. As you know, India is not an NPT member, and we are members of the

Nuclear Suppliers Group, where there is a very specific rule that exports of nuclear equipment and material can only be to a country with full-scope safeguards—which India, of course, does not have.

Three years ago, Russia delivered a small quantity of fuel pellets to a nuclear unit in India because nobody wanted to do that, and they were in a critical situation. Russia was severely criticized within the Nuclear Suppliers Group for this action.

We know that India has enormous plans for nuclear energy. They want to construct at least 20 or 30 power plants, and Russia would be ready to do that. We are already building one that will be finished in two or three years' time. But we do not have the right to construct another unit because of the restrictions of the Nuclear Suppliers Group. We continued the construction of the first unit because the corresponding agreement was signed before 1992 when the strict rules were adopted, and the law isn't retroactive.

The situation is a difficult one. On the one hand, we know that, de facto, India has nuclear weapons, and they would like to become an NPT member as a nuclear state. This is not an easy task. You have to convene the plenary of the NPT, which happens every five years, and you must put it before the plenary, and then have a vote, a majority, and it must be ratified.

There are plenty of problems in the U.S. offer to India that are not at all clear to me. What is the logic behind it? What would be the practical steps? What are the intentions of the United States? What is the timing? This cooperation is prohibited under current international treaties. This is important for Russia to understand, since there is competition among many countries, and U.S. companies would like to bid for nuclear plants in India.

**EIR:** Maybe the U.S. government has realized, after all of these years, that sanctions against India and Pakistan will not accomplish anything, and are trying the carrot, rather than the stick.

**Rybachenkov:** Certainly.

**EIR:** Lyndon LaRouche and *EIR* have stressed the importance of cooperation between India, Russia, and China, to develop the Eurasian heartland. The policy that we promote is that the United States should invest in that cooperation. Now you have an administration that is very ideological, very political, and they like to play the game of a "balance of power," playing one country against another, instead.

**Rybachenkov:** In that regard, there is another important question that may arise. The [American] President spoke about cooperation only with India. What would be the reaction of Pakistan? It is now a close ally of the United States in the struggle against terrorism. This is also a problem.

**EIR:** We see the development of nuclear energy in a broader framework. All of the economic work of Mr. LaRouche is based on the principle that you have real economic growth

when you have scientific breakthroughs and advances in technology. Any other programs to "reduce poverty" are worse than a waste of time.

**Rybachenkov:** I think that is absolutely correct. By the way, this is the position of the Russian President, Vladimir Putin. He always underlines that this is the only way of helping the country to grow and get out of a difficult economic situation.

**EIR:** Mr. LaRouche's good friends in Russia, who share this perspective, include economists Sergei Glazyev and Dmitri Lvov.

**Rybachenkov:** Yes, Lvov, the economist; a very talented and realistic economist. He was always very critical of the economic policy of Yeltsin.

Five years ago, I had a very interesting visit to China, in relation to the construction of a Russian centrifuge plant for uranium enrichment for their nuclear energy sector. We crossed through the country, and they showed us all of their nuclear facilities, and we were accompanied by a gentleman who knew Russian, because he graduated from the Moscow Institute for Energy. It is interesting to note that the Chinese are very "liberal"; but when we were visiting one enrichment plant, we were presented with the leaders of this plant, and one was the Director, and the other was the Party Secretary. They still maintain this Party structure. It was striking. And this doesn't prevent them opening their market, and giving enormous privileges to foreign companies for investments.

I am always telling Americans to better understand what is going on in Russia: The problem is not that we have rich and poor; the problem is that we have those who are very rich, and those who are very poor. And poor Russians, of which we have about 30 million, earn about \$2 per day. I read that this sum is spent by British families for feeding their cats.

The problem is social justice, which is very dear to the Russian people. The problem is that people cannot support the situation when the new rich Russians gain 100 times more than these poor creatures. If they were given at least \$300 per month, there would not be such hatred against Khodorkovsky. This is the problem of social justice. People cannot support this, and it is impossible for 30 million people to live on so little money. They can see that their children do not have the possibility of receiving a good education, because plenty of institutions charge, and the sums are enormous; as much as \$5,000 per year.

That's why people didn't support Nemtsov and his rightist forces in the elections. And some people in the U.S. say, "Why didn't you vote for those wonderful people, like Nemtsov?" But the truth is that people do not trust them.

**EIR:** The real crime of the oligarchs is not just that they were stealing money, but that they were stealing the patrimony of the country.

**Rybachenkov:** Absolutely, I agree with you. Academician Lvov writes many articles on this subject explaining this view.