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# “ON THE ROLE OF COMMERCIAL PROJECTS IN US-RF NON-PROLIFERATION COOPERATION”:

SUMMARY OF MARCH 10 WORKSHOP AT  
THE JAMES A. BAKER III INSTITUTE FOR PUBLIC POLICY,  
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## **On the Role of Commercial Projects in US-RF Non-Proliferation Cooperation**

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## **On the Role of Commercial Projects in US-RF Non-Proliferation Cooperation**

### **Summary of Recommended Actions**

The workshop organizers did not seek formal consensus, but all participants agreed that it would be useful to:

1. Examine ways to engage the Iranians more effectively in a discussion of the future of nuclear power. The goal should be to determine if it is possible to “change the subject” away from the laser-like focus on enrichment that has been the symbol of Iran’s defiance. This discussion should begin with consideration of the back end of the fuel cycle, e.g. the Non-Proliferation Trust project.
2. Find ways to move the United States and Russia expeditiously into negotiation of an Agreement for Nuclear Cooperation (123 Agreement). The G-8 summit meeting in St. Petersburg in July 2006 represents a near-term opportunity for President Bush and President Putin to launch this process.
3. Consider how the new nuclear energy initiatives, i.e. the Global Nuclear Energy Partnership (GNEP) and the Putin initiative to establish international fuel service centers in Russia, relate to the effort to solve the nuclear problem with Iran. All participants agreed that nuclear energy cannot expand in a proliferation-resistant manner if the problem of Iran’s nuclear program continues to fester.

### **Scene-Setting**

This one-day workshop explored how commercial projects have contributed to the resolution of nuclear proliferation problems in the past, in the context of U.S.-Russia cooperation. The workshop also examined how such precedents might be applied to resolving the nuclear stand-off with Iran. In particular, the workshop examined how commercial approaches to the nuclear fuel cycle might facilitate this effort, with a focus on the back end of the fuel cycle and international storage of spent fuel in Russia.<sup>1</sup>

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<sup>1</sup> The meeting was co-organized by the James A. Baker III Institute for Public Policy in Houston, Texas, and the Carnegie Endowment for International Peace in Washington, D.C., as part of the project *A New Model for US-Russian Non-proliferation and Anti-terrorism Cooperation: Test Case of Iran*. The support of the Carnegie Corporation for this project is gratefully acknowledged.

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The subject of the workshop is critical and timely, because the stakes are huge in the impasse between Tehran and the international community. Should Iran move forward with a nuclear weapons program, it would be a great setback for the nonproliferation regime. Many believe that Tehran will not have the ability to produce nuclear weapons for at least five years. The immediate goal of international policy, therefore, should be to delay this acquisition for as long as possible.

There is still time for diplomacy, and the United States and Russia should work together in an effort to reach agreement with Iran. The International Atomic Energy Agency (IAEA) must be involved in inspections and Iran must provide a series of assurances. In the meantime, the report of the IAEA to the Security Council should not be seen as a punitive measure.<sup>2</sup> Instead, the focus should be on developing a plan to provide fuel for nuclear power plants on an assured basis. This plan should not be Iran-centric, but should be available to all countries seeking nuclear energy.

In the U.S.-Russia context, the Highly Enriched Uranium Purchase Agreement (“HEU deal”) has proved a successful model of how commercial mechanisms can advance nonproliferation goals. The question to address now is, can such a rational commercial approach be applied to helping to address the Iranian nuclear program? Thus far, the Iranian public has been wholly focused on enrichment, the front end of the fuel cycle. They have not had to confront the costs, risks, and environmental and safety problems associated with nuclear waste at the back end of the fuel cycle.

Although the highly politicized nature of the nuclear program makes shifting the debate in Iran difficult, nevertheless it would be worthwhile to try. According to some reports, the costs and risks of the nuclear program are beginning to be debated within Iran.

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<sup>2</sup> Although UN action was widely expected, the workshop predated the UN Security Council vote on Iran that occurred on March 29, 2006. The vote started the clock for a report by the International Atomic Energy Agency (IAEA) on whether Iran had ceased all enrichment activities by the end of April. This summary does not comment, therefore, on ensuing Iranian enrichment activities during April, which added up to considerable defiance of the international community. Despite these subsequent developments, the conclusions and recommendations of the workshop remain relevant. In fact, the participants would argue that they are increasingly urgent.

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This goal is important, because the outcome with Iran will be hugely important to the future of nuclear power. If a system can be developed to provide guaranteed fuel services to Iran, and the Iranians perceive it to be in their national interests, then nuclear power can expand worldwide in a way that does not damage the nonproliferation regime. Iran is the most difficult test case, but will be the most beneficial to the future of nuclear power if it succeeds. Thus, Iran must be fully engaged in exploring how their interests might be served in the economic, political, and security fields. In effect, is there something that the international community might offer that is more interesting than enrichment?

The August 2005 proposal from Germany, France, and the United Kingdom (the “EU-3”) offered a number of areas of economic cooperation, and not only on the nuclear energy front. Development of gas and oil technology cooperation was also included. In May 2006, the EU-3 reexamined that proposal and looked beyond it to see what incentives might, at this stage in the negotiations, be offered to Iran. On the security front, of course, the key is whether the United States can be prepared to offer some kind of security assurances to Iran.

It is controversial to be considering incentives to the Iranians when they have resumed experimental enrichment activities and threatened countries in the region, especially Israel. Iran seems committed to putting together a full-scale nuclear weapons program. The commitment is long-standing and a point of national pride. What is more, the Iranians seem indifferent to pressure from the international community and the Security Council—in this sense, the five permanent members of the Security Council (“P-5”) may have miscalculated. Iran shows no sign of backing down, and it has solicited support from other countries by arguing that this is yet another attempt by the industrial West to limit the access of poorer countries to technologies. Moreover, whatever transparency has been in place is weakening.<sup>3</sup>

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<sup>3</sup> In December 2005, the Majlis passed a law requiring the Iranian government to suspend its adherence to the Additional Protocol if the IAEA Board reported Iran to the Security Council. This has now occurred, and as a result, the IAEA has lost important investigative powers, such as for short-notice inspections, expanded access to facilities, and environmental sampling. The original IAEA safeguards agreement remains in force, however. As of this writing, Iran continues to adhere to it, and has begun to dangle again the offer to return to the Additional Protocol, perhaps even to ratify it in the Majlis.

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Despite this pessimistic view, there is still time for diplomacy. However, the P-5 should not force an artificial pace, e.g., by rushing action in the Security Council. Iran is a society in transition. The Iranians are committed to a policy of confrontation at this moment, but a lot can change in five to eight years. The international community should remain united and keep up patient diplomacy. It should continue to look for innovative approaches, such as convincing the Iranians that guaranteed and secure access to nuclear fuel services would be in their interest.

### **Debate on Imminence**

This scene-setting discussion provoked a debate among workshop participants on the imminence of the threat. They recognized that there are two timelines—the first is the amount of time that it would take the Iranians to master the full fuel cycle; the second is the amount of time to develop nuclear weapons. Both timelines might have been shortened by what Iran acquired from the A.Q. Khan network, but the extent of those acquisitions is unknown.

Moreover, the availability of qualified nuclear scientists is a chokepoint. The cadres of nuclear scientists are expanding rapidly through training programs at Iranian universities and technical institutes, some of which are affiliated with the Revolutionary Guards and possibly the Ministry of Defense (MOD). However, the scientists are very young (average age 30) and lack a broad skill set.

Most participants agreed that the secrecy with which Iran has pursued its nuclear program points to firm intent to pursue a clandestine weapons program. Iran sees itself as a great civilization with regional aspirations—in that sense, some participants felt, it differs from North Korea, which might be talked out of a nuclear weapons program for the right combination of inducements. Iran's view of itself as a player on the world stage predetermines its sense of a need for nuclear weapons.

Despite this pessimism, however, the participants agreed that delaying Iran's ultimate acquisition of nuclear weapons is a worthwhile—indeed a vital—goal for the international community. There is definitely room for diplomacy, if only to buy time.

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### **Status of the Russian Proposal**

At the time of the workshop on March 10, Russia and Iran had just completed a series of meetings on the Russian proposal, which calls for Iran to become involved in an international fuel services center in Russia. Iran's industrial-scale enrichment activities would therefore take place on Russian soil, as would fuel fabrication for its power plants, and back-end services to deal with spent fuel. The Russians and Iranians had agreed to keep talking, but a number of issues remained outstanding—for example, how much access would Iranians have to the enrichment process in the Russian facilities? The Russians asserted that they would have none, but Iran continued to insist that the details needed to be fleshed out.

Moreover, the question of whether Iran could retain a centrifuge research and development program on its soil remained open. The Russians had floated the notion of such an experimental facility being allowed, under strict IAEA monitoring and safeguards, but the United States and EU-3 had objected strongly, and Russia backed off. However, the Russian Atomic Energy Agency (RosAtom) seemed to believe it was an idea worth considering, as did Mohammed El Baradei, the Director General of the IAEA.

### **Storing and Safeguarding Spent Nuclear Fuel in Russia**

Following this scene-setting discussion, the workshop turned to specific proposals that could be advanced as practical options for discussion with the Iranians. Storing and safeguarding spent fuel in Russia was the specific topic.<sup>4</sup>

Currently, countries pursue three policy options for dealing with spent nuclear fuel. First, some countries eschew reprocessing and treat the spent fuel as radioactive waste, placing it in repositories (although it has been very difficult to build and commission repositories). The United States has been the best-known example in this category. A second option, which is

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<sup>4</sup> A project workshop in Stockholm in December 2005 discussed some specific options for assured access to fresh fuel at the front end of the nuclear fuel cycle. This Houston workshop, therefore, was designed from the outset to focus on spent fuel issues, especially spent fuel storage.

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pursued by Russia, Great Britain, France, and Japan, is to reprocess the spent fuel in order to obtain the nuclear material for future fuel supplies.

A third option is medium-term storage of spent nuclear fuel, deferring the decision about whether to store it for the long term or recycle it. The decision is left for the future, when the availability of new technologies might make recycling of spent fuel more feasible. Both the United States and Russia could consider such an option, despite their currently different policies toward reprocessing.

In the meantime, however, no permanent decision can be made on a worldwide basis about final storage or disposition of fuel. Spent fuel is being stored at multiple sites (e.g. power plants), which is a dangerous practice. For smaller countries with nuclear power programs such as Switzerland and the Netherlands, this indecision is a real problem.

Russia has already decided to reprocess spent fuel to acquire uranium that is used as fuel in the RBMK (“Chernobyl-style”) reactors. However, in the process, it is acquiring separated plutonium, which is a headache due to increased radioactivity, the need for physical protection, etc. In this sense, reprocessing is not an economic or technological “privilege.”

However, because of its extensive activities in both military and peaceful nuclear areas, Russia has a significant amount of experience that would facilitate establishment of a spent fuel storage facility on Russian soil. VVER-1000 spent fuel is currently in centralized wet storage facilities of 6000-ton capacity.<sup>5</sup> In addition to Russia, the Mining and Chemical Combine at Krasnoyarsk already accepts spent fuel of Russian origin from Ukraine and Bulgaria.

A dry storage facility is being constructed with design capacity of 38,000 tons; this will allow Russia to store all of its spent fuel through 2040. Russia has a lot of experience with dry storage, having used it for research reactor spent fuel for 35 years. Transportation methods are also well-developed, with the necessary casks and railway cars already in place. More than 5000 tons of spent fuel have already been moved to Mayak and Krasnoyarsk without incident.

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<sup>5</sup> An additional 2800 tons of capacity are expected after reconstruction of the facilities.

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Russia also has a lot of experience with accounting for spent fuel. After processing, the amount of fresh fissile material that was derived from spent fuel can be known with a high level of accuracy. The Russian practice is to consolidate this information in a database using strictly controlled identification numbers.

As far as physical protection is concerned, both the Mayak facility and the Mining and Chemical Combine are in closed cities, which have added military protection. Material protection at these sites has been a matter of international cooperation and has been deemed adequate. Krasnokamensk near Chita offers similar advantages.

Furthermore, Russia already has a policy in place, agreed by the Russian government and Duma, to move to a new generation of fast neutron reactors for the national nuclear power program. Therefore, Russia will already be using spent fuel from light water reactors in 2030, when fast neutron reactors will be commissioned for industrial use.

As far as the necessary legislation is concerned, Russia has already made changes to allow spent fuel of both Russian and non-Russian origin to be imported to Russia. This legislation is adequate for medium-term storage with a deferred decision about final disposition. If an international spent fuel storage facility is built in Russia, then additional legislation will be needed only if the decision is made to store it in a repository for the long term rather than recycle it. Existing Russian legislation prohibits such final disposition of non-Russian origin fuel. However, if the new fast reactor program is a success, Russia will have a full answer to the disposition problem, and no new substantive legislation will be required.

During discussion, a question arose as to whether Russia has competitors for constructing an international spent fuel storage facility. In answer, it was stressed that in any event, Russia will construct centralized facilities for storing Russian spent fuel. In that context, expanding the scope of those facilities so that they can serve international customers makes sense. The existing norm is that each country must take care of its own nuclear waste. However, that approach is not optimum if, for example, a country has bad geology (seismic problems). Most countries are constrained politically from providing international spent fuel storage on their soils.

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### **The Non-Proliferation Trust Project (NPT)**

The workshop turned to the next agenda item, the Non-Proliferation Trust (NPT), a specific concept for an international spent fuel storage facility in Russia. NPT Inc. is a U.S.-Russian joint project under which ownership would be held by three nonprofit foundations incorporated in the United States. These foundations would manage the proceeds of NPT Inc., using them to fund urgent projects in Russia, such as environmental cleanup at nuclear sites; protection, control, and accounting for nuclear materials; and social welfare (health and education) for workers at nuclear facilities.<sup>6</sup>

The NPT was formulated as a project during a period when Russia was at a low point in its post-Cold War crisis. Today, Russia is more stable, and its economy is on the rise. One of the critical issues discussed, therefore, was whether the environment for the project had changed. Because the Russian government is now more interested in maintaining control of critical assets, would Russia rather see control of the Non-Proliferation Trust solely in Russian hands?

In the discussion, it became clear that all participants in NPT still consider the concept to be highly beneficial to Russia, the United States, and the international community in its current structure. Although Russia's economy is improving, sectors of it are still in deep crisis and funds are needed to address the social consequences of the Cold War. The initial list of 49 projects to address those consequences was developed by Russians and vetted by the Russian government and the Board of Directors of NPT Inc. Furthermore, the Board of Directors is being expanded to include more Russian as well as international members.

Another critical point is that the United States has consent rights to a huge amount of spent fuel internationally. This means that the United States, having sold fresh nuclear fuel to countries such as South Korea and Japan, has a say in its handling as spent fuel. Such fuel cannot be moved into an international spent fuel storage facility in Russia unless the United States agrees.

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<sup>6</sup> A detailed discussion paper on the Non-Proliferation Trust was prepared in advance of the Houston meeting on: Project "A New Model for U.S.-Russian Nonproliferation and Antiterrorism Cooperation: Test Case of Iran" Assuring Access to Nuclear Fuel Cycle and US-Russian NPT Project On Storing and Safeguarding International Spent Nuclear Fuel in Russia.

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For this reason, it will be necessary to negotiate an “Agreement for Nuclear Cooperation” between the United States and Russia, often called a “123 Agreement” referring to Section 123 of the U.S. Atomic Energy Act.

Under a 123 Agreement, the United States would require assurances that the material will be secure and safely handled, that a repository will be available for it, that project finances will be transparent, and that the spent fuel will not be reprocessed to separate plutonium.<sup>7</sup> Once the Agreement is negotiated, U.S. congressional support will be required to move the project forward. Such support will not be forthcoming unless Congress feels assured that the money will not be used in Russian national security programs.

Thus, the necessity of the 123 Agreement creates an added incentive to develop projects that must be agreed jointly between the U.S. and Russia. The environmental and nonproliferation benefits will be an important factor in the acceptance of the project in both countries. Both countries will have to agree on the agenda of projects in order for the NPT to succeed.

### **Iran and the Non-Proliferation Trust Project**

As stated at the outset of the workshop, a universal and nondiscriminatory (“not Iran-centric”) policy is essential for Iran. Thus far, the Russian proposal to Iran has emphasized a universal approach to reliable supplies of fresh fuel. It would allow the Iranians to become more involved in fuel cycle activities on Russian soil, although it would not give them direct access to enrichment technologies or processes. Therefore, it does not address the issue of national pride in possessing certain knowledge, in this case enrichment of uranium.

A key question is whether involving the Iranians in a broader array of nuclear energy cooperation might temper their laser-like focus on nuclear enrichment. For example, the focus of

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<sup>7</sup> The United States is currently launching a nuclear energy initiative called the Global Nuclear Energy Partnership (GNEP). The GNEP calls for the recycling of spent fuel but, consistent with existing U.S. policy, opposes the separation of plutonium. Although GNEP was not a focus of the workshop, the new U.S. openness to recycling of spent fuel to deal with minor actinides was briefly discussed. It was seen as a development that could have a positive impact on the NPT project, although some participants believed it “muddied the water” on the question of ultimate disposition of spent fuel.

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the new U.S. initiative, the Global Nuclear Energy Partnership, is on expanding nuclear power in a proliferation-resistant way, by deploying new nuclear energy technologies that will not contribute to the proliferation of nuclear weapons. Likewise, President Putin's proposal to develop new international fuel cycle centers on Russian territory is predicated on the notion that such cooperation will be developed in a way that will strengthen the nonproliferation regime.

Both U.S. and Russian concepts should be further developed by taking into account the problem of Iran. In particular, consideration should be given to how to engage Iran in scientific work on new nuclear fuels and fuel cycles that are proliferation-resistant by nature—even the fast reactor technologies that are at the heart of the new U.S. and Russian concepts. If Iran maintains its insistence on autarchic pursuit of enrichment technology as the only way to build up its nuclear power program, then other countries will likely follow its lead. Thus, it will become impossible to expand nuclear power in a proliferation-resistant manner. For this reason, the United States and Russia have an interest in engagement with Iran on nuclear power technologies.

A way to begin this engagement is to discuss with Iran the Non-Proliferation Trust project. As noted above, neither the Iranian government nor public has shown much awareness of issues related to the back end of the fuel cycle. There is a value, therefore, in talking to them about the important contribution that the NPT project can make to addressing what will be a significant burden for them—spent fuel storage and disposition. In essence, speaking to Iran about the NPT project would raise the value to Iran of the Russian proposal already on the table to provide enrichment and fuel services. If it wished to do so, the Russian government could undertake such a discussion, but it could also be started on an informal, nongovernmental basis.

### **Importance of a 123 Agreement**

But for the NPT project to become a reality, the United States and Russia will have to get serious about negotiating a 123 Agreement. President Bush and President Putin should indicate their support for this effort at the summit of the G-8 in St. Petersburg in July, 2006, and they should task their governments to begin the negotiating process. The goal should be to complete the agreement on an expeditious basis. The two presidents should ask for a report on progress in the

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negotiations on a regular basis, perhaps in the context of existing reporting requirements such as those under the Bratislava Summit statement.

Another mechanism to facilitate negotiation of a 123 Agreement that the workshop explored was the formation of a joint advisory committee. This would be a group that would include representatives from the scientific community, environmental groups, and companies interested in the outcome, as well as former government officials, with the goal of advising the U.S. and Russian governments on issues to be confronted in negotiating and implementing a 123 Agreement. Such an advisory group would serve to keep attention focused on completion of the Agreement in a reasonable period, and could offer useful suggestions for achieving progress in the shortest possible time.

### **Recommended Actions**

Although the workshop did not agree to recommendations on the basis of formal consensus, the participants did note that it would be useful to pursue action and/or further discussion in three broad areas:

1. Examine ways to engage the Iranians more effectively in a discussion of the future of nuclear power. The goal would be to determine if it is possible to “change the subject” or at least broaden the subject away from the laser-like focus on enrichment that has been the symbol and anchor of Iran’s defiance against the international community. A broader discussion of the future of nuclear power should begin with consideration of the back end of the fuel cycle, and here the Non-Proliferation Trust project could play a vital role.
2. Find ways to move the United States and Russia expeditiously into negotiation of an Agreement for Nuclear Cooperation (123 Agreement) that would enable the Non-Proliferation Trust project to be implemented. The G-8 summit meeting in St. Petersburg in July 2006 represents a near-term opportunity for President Bush and President Putin to launch this process and task its near-term completion.

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3. Consider how the new nuclear energy initiatives, i.e. the Global Nuclear Energy Partnership (GNEP) and the Putin initiative to establish international fuel service centers in Russia, relate to the effort to solve the nuclear problem with Iran. Although neither GNEP nor the Putin initiative were an explicit part of the workshop agenda, all participants agreed that there is a linkage between finding a solution to the Iran problem and the success of these new initiatives. Nuclear energy cannot expand in a proliferation-resistant manner if the problem of Iran's nuclear program continues to fester.