

## ACCELERATING AND EXPANDING THE HEU PURCHASE AGREEMENT

### I. The Issue

Signed in 1993, the U.S.-Russia Highly Enriched Uranium (HEU) Purchase Agreement has eliminated more than 150 tons of HEU—“the easiest material for terrorists to make nuclear weapons from.”<sup>1</sup> While the HEU Purchase Agreement is a landmark achievement, the rate at which that agreement is rendering HEU unusable for nuclear weapons will leave very large quantities of HEU in storage in Russia for an unacceptably long period of time. Moreover, when action under that agreement is completed in over a decade, Russia will still possess hundreds of metric tonnes of HEU, enough to build thousands of nuclear weapons.

Under the HEU Purchase Agreement, Russia takes HEU that has been removed from its dismantled nuclear warheads and down-blends it into low-enriched uranium (LEU), which cannot create an explosive nuclear chain reaction. The United States Enrichment Corporation (USEC), a private corporation serving as executive agent for the HEU Purchase Agreement, purchases this LEU and resells it to U.S. companies that use it as commercial nuclear reactor fuel.<sup>2</sup> At present, 30 tons of HEU are blended down each year under the agreement—enough for approximately 1,500 weapons.

The utility of the agreement has been summed up as follows: “the HEU purchase provides financial incentives to dismantle thousands of warheads, destroys hundreds of tons of weapons-usable material that could otherwise be vulnerable to theft, provides employment to thousands of Russian nuclear workers, and provides hundreds of millions of dollars a year to the desperate Russian nuclear complex—all at little net cost to the U.S. taxpayer, since funds to purchase the material come from its value as commercial fuel.”<sup>3</sup>

Post-September 11, 2001, the United States and Russia are in a radically altered security environment. U.S.-Russia cooperation to reduce the threat of nuclear weapons, one of the most dangerous capabilities known to humankind, has greatly increased. The United States and Russia realize that they cannot allow multiple decades to pass before vulnerable nuclear weapons and materials are properly accounted for, secured, and, where feasible, eliminated.<sup>4</sup> Also, Russia devotes approximately 3.3 percent the resources per year as compared to the U.S. to ensuring the safety of its fissile material stockpiles.

One of the most encouraging steps in accelerating work to address the problem of loose nuclear weapons and materials came during the May 2002 U.S.-Russia summit. The summit’s Joint Declaration on the New Strategic Relationship Between the United States of America and the Russian Federation stated that the two countries would “work

closely together, including through cooperative programs, to ensure the security of weapons of mass destruction and missile technologies, information, expertise, and material [and to]... expand efforts to reduce weapons-usable fissile material... [And also] establish joint experts groups to investigate means of increasing the amount of weapons-usable fissile material to be eliminated, and to recommend collaborative research and development efforts on advanced, proliferation-resistant nuclear reactor and fuel cycle technologies.’<sup>5</sup>

To accelerate the down-blending of HEU, a recent report released by Harvard’s Belfer Center and the Nuclear Threat Initiative suggests that “by paying Russia a fee for service to blend additional HEU to LEU and then hold it in storage in Russia (rather than flooding the uranium mining, enrichment, and conversion markets with it), the national security objective of destroying HEU could be decoupled from market constraints.”<sup>6</sup> This is an important requirement since the current rate of blend-down—30 tons/year—is determined by what the commercial market can bear rather than what national security requires. By placing LEU into a national security reserve of sorts, rather than flooding the LEU market, the national security benefits of the agreement can be strengthened while the LEU market will not be undermined. The same report also contends that with \$50 million in annual funding approximately 20-30 additional tons of HEU could be down-blended—essentially doubling the current rate. This would result in more than one thousand bombs’ worth of additional HEU being destroyed every year.

The national security benefits to the United States of accelerating the down blending of Russian HEU are obvious, as Russia possesses almost 95 percent of the military HEU outside of the United States. By accelerating the pace of disposing of Russian HEU, much of which Russia has deemed in excess of its defense needs, the United States will greatly decrease the likelihood of this material falling into the hands of those who wish the U.S., its allies, and deployed troops deadly harm.

**APPENDIX A<sup>7</sup>**

Estimated military stocks of HEU, 2000

Country	HEU (tonnes) <sup>8</sup>	Percentage of world total
Russia	970	58%
United States	635	38%
United Kingdom	15	1%
France	24	1%
China	20	1%
Pakistan	0.7	0.04%
Israel	Unknown	Unknown
India	Unknown	Unknown
North Korea	Unknown	Unknown

## II. Recent Legislation

- Sec 3157 of the FY03 Defense Authorization Act (Public 107-314) authorizes the Department of Energy to use \$10 million of FY03 appropriations for its defense nuclear nonproliferation programs to explore options to accelerate the disposition of Russian HEU, including additional blending and storage facilities in Russia.
- Section 3162 of the FY03 Defense Authorization Act (P.L. 107-314) expresses the sense of Congress that the Secretary of Energy should, in consultation with the Secretary of State and Secretary of Defense, develop a comprehensive program of activities to encourage all countries with nuclear materials to adhere to, or to adopt standards equivalent to, the International Atomic Energy Agency standard on The Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Rev.4), relating to the security of stockpiles of highly enriched uranium (HEU) and plutonium (Pu).

## III. Obstacles

- Russia and the United States have not started negotiations aimed at accelerating HEU blend-down activities beyond what is currently envisioned under the HEU Purchase Agreement.
- Some fear that by accelerating HEU blend-down and expanding the amount to be down-blended that the uranium market will suffer, but this can be addressed by carefully designing an approach so that the industry has confidence the material will not flood onto the uranium mining, enrichment, and conversion markets.
- To increase the likelihood that Russia will agree to blend down additional HEU and to accelerate current blend down efforts, the United States must reassure Russia that it will assist in the marketing of LEU, among other incentives.

## IV. Q & A

### **Q: Why would Russia agree to get rid of more HEU?**

**A:** Because they possess HEU far in excess of their defense needs. They have already agreed that 500 metric tonnes are in excess of their defense needs, and as their nuclear arsenal continues to shrink, the need for HEU will continue to decrease.

### **Q: Won't accelerating the blending down of HEU lead to a dramatic decline in the price of uranium, thus harming, for instance, the U.S. uranium mining, conversion, and enrichment industry?**

**A:** Not if the material is placed in a type of national security escrow—basically placing it in safekeeping in Russia and gradually introducing the material into the uranium market. This will make it possible to reduce rapidly the number of Russian nuclear warheads and otherwise decrease Russia's excess HEU stockpiles. In fact, the FY03 National Defense Authorization Act (sec. 3157) specifies that the uranium blended down under the prospective new program may not be released for sale until the earlier of (1) January 1, 2014, or (2) the date on which the Secretary of Energy

certifies that the uranium can be absorbed into the global market without undue disruption to the uranium mining, conversion, and enrichment industry in the U.S.

What the uranium industry wants more than anything is predictability—to know with confidence, ideally more than a decade in advance, how much material is coming to market and at what rate so that investments in mines, enrichment facilities, and the like can be planned.

**Q: How much will it cost accelerate the HEU deal?**

**A:** Thousands of additional warheads' worth of HEU could be down-blended each year for around \$50 million per year.

**V. Talking Points**

- Russia has already agreed that 500 metric tonnes of HEU are excess to its defense needs. The United States should engage in negotiations to convince them to dispose of several hundred more tonnes in its stockpile.
- At the current rate, it will take 20 years for Russia to blend-down 500 tonnes of HEU; but even after that has been done Russia will still have several hundred tonnes left. It behooves the U.S. to help Russia decrease the size of its fissile materials stockpile, thus making proliferation less likely.

**VI. Factoids**

- Russia possesses approximately 95 percent of the world's nuclear weapons and materials outside of the United States, including close to 1,000 tonnes of HEU, enough to build thousands of weapons.
- With 970 tons of HEU, Russia could produce up to 48,500 warheads, but under the Treaty of Moscow, Russia and the U.S. are each allowed to have no more than 2,200 long range nuclear weapons on December 31, 2012.
- Only 40% of Russian fissile material such as HEU is in facilities that have received security upgrades.
- Russia devotes approximately 3.3 percent the resources per year as compared to the U.S. to ensuring the safety of its fissile material stockpiles.

**VII. Applicable Treaties, Legislation, and Other International Agreements**

- The 1993 U.S.-Russian Highly Enriched Uranium (HEU) Purchase Agreement<sup>9</sup>
- For information on the activities of the United States Enrichment Corporation (USEC), a private corporation which serves as executive agent for the HEU Purchase Agreement, visit their website: <http://www.usec.com>.
- Annual Energy and Water Development Appropriations Acts provide funding (\$14 million for FY02) for DOE's HEU Transparency Implementation Program, which is responsible for monitoring implementation of the 1993 agreement so as to assure the U.S. that the terms of the agreement are being met.

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<sup>1</sup> Much of the material in this paper is drawn from Matthew Bunn, John P. Holdren, and Anthony Wier, "Securing Nuclear Weapons and Materials: Seven Steps for Immediate Action," Project on Managing the Atom, Belfer Center for Science and International Affairs, Harvard University, May 2002, accessed at: [http://www.nti.org/e\\_research/securing\\_nuclear\\_weapons\\_and\\_materials\\_May2002.pdf](http://www.nti.org/e_research/securing_nuclear_weapons_and_materials_May2002.pdf).

<sup>2</sup> For information on the activities of the United States Enrichment Corporation (USEC), visit their website at: <http://www.usec.com>.

<sup>3</sup> Matthew Bunn, et. al., "Securing Nuclear Weapons and Material...", *op. cit.*

<sup>4</sup> Ibid.

<sup>5</sup> The White House, "Text of the Joint Declaration by President George W. Bush and President Vladimir V. Putin on the New Strategic Relationship Between the United States of America and the Russian Federation," May 24, 2002, accessed at: <http://www.whitehouse.gov/news/releases/2002/05/20020524-2.htm>.

<sup>6</sup> Matthew Bunn, et. al., "Securing Nuclear Weapons and Material...", *op. cit.*

<sup>7</sup> Steve Fetter, "Stockpile Declarations," in Nicholas Zarimpas, ed., *Building a Nuclear Stockpile and Warhead Dismantlement Transparency Regime: Issues and Options* (Oxford: Oxford University Press, 2002), p. 10, Joseph Cirincione with Jon B. Wolfsthal and Miriam Rajkumar, *Deadly Arsenal: Tracking Weapons of Mass Destruction* (Washington, DC: Carnegie Endowment for International Peace, 2002), p. 241, and [Globalsecurity.org](http://www.globalsecurity.org), "World Special Weapons Guide," accessed at: <http://www.globalsecurity.org/wmd/world/index.html>.

<sup>8</sup> Equivalent tonnes of weapon-grade HEU (93 percent Uranium-235).

<sup>9</sup> "Russian-U.S. HEU Purchase Agreement," accessed at: <http://www.nti.org/db/nisprofs/russia/fulltext/HEUdeal/HEUfull.htm>.