Nuclear Threat Reduction CAMPAIGN

A program of Vietnam Veterans of America Foundation and The Justice Project

INVENTORY OF RUSSIAN NUCLEAR WEAPONS AND MATERIALS

I. The Issue

During the Cold War, the United States and the Soviet Union produced over a thousand metric tons of weapon-grade nuclear material, enough to build approximately 175,000 nuclear warheads.[1] In 1986, at the height of the U.S. and Russian nuclear weapons build up, the two countries possessed almost 64,000 nuclear warheads.[2] Today, the United States and Russia possess over 95% of the world's assembled nuclear weapons and weapon-grade material. (Appendix A provides a summary of the world's supply of nuclear weapons and materials.)

Unfortunately, the Russian nuclear system is unable to account fully for its inventory of weapon-grade material and nuclear weapons. Unlike the United States, which relied on physical security and detailed record keeping, the Soviet system concentrated much more on keeping weapons and materials in remote locations and on having a closed society and closed borders and an intrusive KGB than on physical security and detailed accounting. This appears to be especially true for weapon-grade nuclear material and maybe even for portable "tactical" nuclear warheads.[3]

At the end of the Cold War, new and unexpected challenges to global security emerged. During the Cold War, the focus of American national defense was a strong Soviet Union with global nuclear reach. Now, Russia's economy is weak and its nuclear infrastructure is in disarray, risking its weapons complex becoming a "Home Depot" for terrorists and terrorist states. This has made Russian weakness the focal point of concern. While the United States and Russia have instituted numerous programs to address the proliferation threat from Russia, neither state has absolute confidence in the weapons and materials stockpile of the other. Until this issue is addressed, deeper cooperation between the two states is unlikely.

Working to establish comprehensive inventories of U.S. and Russian nuclear warheads and materials, accompanied by exchanges of that information, would be the first steps in the long, but very important process of establishing fissile material and warhead inventories in which both sides have confidence. Additional steps would include ongoing declarations, inspections to check the accuracy and completeness of the declarations, and measures to verify the dismantling or safe storage of warheads and the elimination of warhead components. (For more information on types of data that might be included in a comprehensive inventory of nuclear weapons and materials, see Appendices B and C.)

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The problems of accounting for and securing Russian weapons and weapon-grade fissile material will grow even more acute in the coming years as Russia removes thousands of warheads from its strategic arsenal under the Treaty of Moscow, signed by Presidents Bush and Putin in May of 2002. While reducing the two countries' numbers of strategic warheads is very desirable, Russia's security system for its deployed nuclear weaponry is generally believed to be quite strong and may be much better than the security of the system it will use for the storage or dismantlement of the warheads. Consequently, the U.S. should accelerate activities to help the Russians greatly improve their nuclear weapons and materials storage and dismantlement system.

APPENDIX A[4]

Estimated Number of Warheads and Military Stocks of Plutonium and HEU, 2000

Country	Warheads	Percentage of world warheads	Plutonium (tonnes)	Percentage of world total of Pu	HEU[5] (tonnes)	Percentage of world total of HEU
Russia	20,000	63%	130	53%	970	58%
United States	10,500	33%	99.5	40%	635	38%
United Kingdom	185	0.6%	7.6	3%	15	1%
France	450	1.4%	5	2%	24	1.4%
China	400	1.3%	4	1.6%	20	1.2%
Israel	100	0.3%	0.5	0.2%	Unknown	Unknown
India	65	0.2%	0.3	0.1%	Unknown	Unknown
Pakistan	40	0.1%	0.005	0.002%	0.7	0.04%
North Korea	No agreed estimate (possibly 1-2)	Unknown	0.03	0.012%	Unknown	Unknown

APPENDIX B[6]

Levels of Information that could be included in Declarations of Nuclear Warhead and Fissile Materials Inventories

Level	Nuclear Warheads	Fissile Materials
1	• Current aggregate stockpiles • Historical data on stocks, assembly, disassembly	• Current aggregate stockpiles • Historical data on stocks, production, consumption
2	• Warhead type, delivery system • Status (deployed, reserve, etc.) • Historical data by type	• Isotopic grade (weapon-grade, etc.) • Chemical form (metal, oxide, etc.) • Physical form (pit, fuel, etc.) • Historical data by grade/form
3	• Inventory by declared facility • Facility descriptions	• Inventory by declared factility • Facility descriptions
4	• Serial number, location, status of each warhead	• Location, mass, composition of each item or container

APPENDIX C[7]

An Illustrative Reporting Arrangement for Fissionable Materials

The details of a comprehensive arrangement for registering all fissionable materials would involve annual reports from the United States and Russia listing their fissionable materials holdings in each of the following categories:

A. Amounts of plutonium with the isotope Pu-240 comprising:
   1. 10 percent or less
   2. Greater than 10 percent

B. Amounts of uranium with the isotope U-235 comprising:
   1. Greater than 85 percent
   2. 65-85 percent
   3. 40-65 percent
   4. 20-40 percent
   5. Less than 20 percent

C. Amounts of uranium with the isotope U-233 comprising:
   1. Greater than 80 percent
   2. 12-80 percent

D. All separated amounts of neptunium 237

Categories A1 and B1 have historically been the primary weapons materials, but all the other categories except B5 have potential weapons application as well. The other categories reflect the fuels and by-products of varying types of reactor design.

II. Recent Legislation

- Section Three of S. 2478, "The Nuclear and Terrorism Threat Reduction Act of 2002," sponsored by Senators Mary Landrieu (D-LA) and Gordon Smith (R-OR), called for comprehensive inventories and data exchanges between the United States and the Russian Federation on weapon-grade material and nuclear weapons.

- Title II of H.R. 4624, the "Nuclear Threat Reduction Act of 2002," sponsored by Representatives John Spratt (D-SC) and Ellen Tauscher (D-CA), called for the United States to work cooperatively with Russia to establish inventories and data exchanges of warheads, fissile materials, and tritium.

III. Obstacles

- The primary obstacle to date has been unwillingness on the part of the United States and Russia to bury elements of Cold War secrecy that prevent addressing this acute problem. With the dramatic improvements in the U.S.-Russia relationship over the past decade, and especially the last year, this unwillingness should become a thing of the past.

IV. Q & A

Q: Why hasn't Russia created such an inventory yet? They must have some inventory of their weapons and materials.
A: Russia inherited a vast, far-flung nuclear complex from the Soviet Union. The task of accounting for all of Russia's nuclear weapons and materials is a very difficult task for a country with many competing priorities for scarce fiscal resources. Also, Russia does not have the same level of expertise in creating such an inventory as the U.S., which has already created an inventory of its plutonium and highly enriched uranium programs and has a very thorough accounting of all it nuclear warheads.

Q: Will the Russians allow us to know very detailed information regarding their weapons and materials?
A: Certainly there are limits to the level of detail that either the U.S. or Russia would give one another regarding such sensitive matters. That said, the aim should be to help the Russians create an inventory so that they can account for their warheads and materials. The U.S. and Russia could exchange information at agreed-upon levels of detail and conduct regular visits to verify the information exchanged.

V. Talking Points

- U.S. national security will be improved if the Russians have the highest level of confidence possible regarding where all their nuclear weapons and materials are, thus decreasing the likelihood that a terrorist group could steal a warhead or the material to produce one.

- The U.S. has already created an inventory of its plutonium and highly enriched uranium programs and is known to have a very thorough accounting of all it nuclear warheads. We should help the Russians do likewise.

- Russia inherited an inadequate nuclear weapons and materials accounting system. These deficiencies have been exacerbated by the economic instability of Russia in the past decade.

VI. Factoids

- Russia possesses 95 percent of the world's nuclear weapons and materials outside of the United States.

- Compared to the U.S., Russia devotes approximately 3.3 percent of the resources per annum to ensuring that its nuclear arsenal is accounted for and secure.

- A March 3, 2002, *Time* magazine cover story demonstrated the need to inventory Russian nuclear weapons and materials. In October 2001, the U.S. government feared that al Qaeda might have smuggled a 10-kiloton nuclear warhead into New York City. Of particular concern was a Russian nuclear commander's admission that he feared that a 10-kiloton warhead under his control had been lost.[8] If placed in lower Manhattan, such a device—relatively small by U.S. and Russian standards—would probably kill 250,000 people and render the entire area uninhabitable for decades.

VII. Applicable Treaties, Legislation, and Other International Agreements

- The Atomic Energy Act of 1954 (42 U.S.C. 2164(c)) would need to be amended to allow certain types of information to be exchanged between the United States and Russia.

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[1] Harold Feiveson and Steve Fetter, "Verifying Deep Reductions in Nuclear Forces," in Harold Feiveson, ed., *The Nuclear Turning Point: A Blueprint for Deep Cuts and De-alerting of Nuclear Weapons* (Washington, DC: The Brookings Institution, 1999), pp. 221.

[2] NRDC (Natural Resources Defense Council) Nuclear Notebook, "Global Nuclear Stockpiles, 1945–2002," *Bulletin of the Atomic Scientists*, Nov./Dec. 2002, Vol. 58, No. 6, pp. 103–104, accessed at: http://www.thebulletin.org/issues/nukenotes/nd02nukenote.html.

[3] A considerable portion of the material in this paragraph and the paper in general is drawn from John D. Steinbruner, *Principles of Global Security* (Brookings, 2000), pp. 73-80.

[4] Adapted from 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 Arsenals: Tracking Weapons of Mass Destruction* (Washington, DC: Carnegie Endowment for International Peace, 2002), p. 241, and Globalsecurity.org, "World Special Weapons Guide," accessed at: http://www.globalsecurity.org/wmd/world/index.html.

[5] Equivalent tonnes of weapon-grade HEU (93 percent uranium-235).

[6] Steve Fetter, "Stockpile Declarations," *op. cit*., p. 10.

[7] This table is adapted from: Carnegie Commission on Preventing Deadly Conflict, *Comprehensive Disclosure of Fissionable Materials: A Suggested Initiative*, report by John Steinbruner, et. al., June 1995.

[8] Romesh Ratnesar, "Can We Stop the Next Attack?," *Time*, 3 Mar. 2002.