

### Enormous Excess Stockpiles—And Still Larger Remaining Military Stocks

The United States and Russia have each declared enough fissile material for many thousands of nuclear weapons excess to their military needs. But the stockpiles of fissile material each country is holding in reserve for military uses are even larger than the amounts declared excess—easily enough to support stockpiles of well over 10,000 nuclear weapons.

As shown in Figure 2, the 174.3 tonnes of HEU the United States has declared excess represents only about a quarter of its estimated 645-tonne HEU stockpile.<sup>1</sup> All of the remainder is currently planned to remain in the military stockpile, for use in weapons or as naval fuel (enough, by one unclassified estimate of the average amount of HEU in modern thermonuclear warheads,<sup>2</sup> for more than 20,000 nuclear weapons). Indeed, with the exception of the first 10 tonnes of HEU declared excess, all of the HEU the United States has declared excess is HEU that did not meet the specifications for use as naval fuel; with that small exception, *all* of the material the Navy considered usable has been kept in military reserve. This remaining military stockpile is more than 40 percent larger than the 325 tonnes that would be needed to have both a stockpile of 10,000 weapons—as the United States reportedly plans to retain under START II—and a 100-tonne additional stockpile for naval fuel (enough for several decades' supply). Russia's excess declaration leaves it with an even larger remaining military stockpile of HEU, amounting to 550 tonnes or more.

Much the same situation pertains with respect to plutonium. While the United States has declared more than half of its plutonium stockpile excess, 18 tonnes of this excess material is either reactor-grade or fuel-grade, in spent fuel that was never separated, or in other forms so contaminated that they were never likely to be used in the U.S. weapons stockpile in any case. Of the 52.5 tonnes of excess plutonium, 34.5 tonnes is both weapon-grade and close enough to being pure to be judged to require substantial processing for disposition (and therefore to be included in the U.S.-Russian plutonium disposition agreement now being negotiated); of this, only 25 tonnes is actually pure weapon-grade metal—material directly suitable for use in nuclear weapons.<sup>3</sup> Somewhat more than 21 tonnes of this—less than half the material declared excess—actually came from recently dismantled nuclear weapons.<sup>4</sup> The United States is retaining roughly 47 tonnes of weapon-grade plutonium for weapons use (believed to be essentially all in clean metal form, representing nearly twice the amount of material in that form declared excess). By one unclassified estimate of the amount of material per weapon in modern thermonuclear weapons,<sup>5</sup> this represents enough for over 13,000 nuclear weapons.

In Russia, the situation is slightly more complex, as in different statements at different times, Russia has identified several categories of plutonium which it has pledged never to use in weapons. The 50 tonnes included in Russia's formal declaration of excess, unlike the U.S. excess material, is entirely weapon-grade metal coming from dismantled nuclear weapons. Because there is only 34 tonnes of roughly comparable material in the U.S. excess declaration, however, only 34 tonnes of the Russian excess will be covered in the U.S.-Russian disposition agreement now nearing completion, leaving 16 tonnes of the plutonium Russia has declared excess to be dealt with by some other means at a later time. In addition, Russia has pledged never to use its stockpile of civilian separated plutonium in weapons (30.3 tonnes as of the end of 1998,<sup>6</sup> growing by roughly a tonne per year as reprocessing continues), and it has also pledged that plutonium produced at its three remaining plutonium production reactors since October 1994 will never be used in weapons (amounting to roughly 7.5 tonnes by the end of 1999, growing at a rate of approximately 1.5 tonnes per year). Thus, the total quantity of Russian plutonium pledged to non-weapons use as of the end of 1999 stood at approximately 88 tonnes, out of a total estimated stockpile of over 160 tonnes of separated plutonium, both military and civilian. The 34 tonnes of plutonium to be covered in the U.S.-Russian agreement represents only about one-fifth of the total stockpile of Russian separated plutonium, and less than 40 percent even of the Russian plutonium already pledged to non-weapons use. If the 160-tonne total figure is roughly correct, it appears that Russia plans to retain over 70 tonnes of plutonium in its military stockpiles, enough for roughly 20,000 nuclear weapons.

<sup>1</sup> The correct figure is actually less than one quarter, as the 645-tonne estimate is based on tonnes of equivalent 90% enriched HEU; since most of the 174.3 tonnes is at substantially lower enrichment levels, the equivalent number of tonnes of 90% enriched material would be much less than 174.3 tonnes.

