

**Status and Stocks of Military Plutonium in the
Acknowledged Nuclear Weapon States**

June 1, 2004, *Revised June 30, 2005*

Table 1 Military and Excess Stocks of Plutonium in the Acknowledged Nuclear Weapon States, end of 2003 (in tonnes)

Official State Declaration of Stocks

	Total(a)	Military Stock(b)	Declared Excess(b)	Under Safeguards
U.K.	7.6 ($\pm 2\%$?)	3.2	4.4	4.4
U.S.	99.5 ($\pm 2\%$)	47	52.5	2

ISIS Estimates of Stocks

	Total(a)	Military Stock(b)	Declared Excess(b)	Under Safeguards
China(c)	4.1 (2.1-6.6)	4.1	0	0
France	5 (3.6-6.4)	5	0	0
Russia(d)	145 (120-170)	95	50	0
Total	261 (231-292) (e)	155 (e)	107 (e)	6.4

Notes and Comments

- (a) The values in the parentheses are the percentage uncertainty or the range of the total estimated stock.
- (b) Only the central estimates are used in these two columns.
- (c) China's military plutonium stock remains highly uncertain. It reportedly continued to produce plutonium in at least one military reactor after Chinese officials unofficially acknowledged that plutonium production for weapons ceased in 1991. The estimate for the amount of weapon-grade plutonium produced prior to this cutoff is 2.3-3.2 tonnes. The rest of the plutonium produced is believed to be fuel-grade. For more information, see *Chinese Military Plutonium and Highly Enriched Uranium Inventories* by David Albright and Corey Hinderstein, June 22, 2005.
- (d) Russia continues to produce about 1.4 tonnes/year of plutonium in its three remaining plutonium production reactors. Plutonium produced after late 1994, or almost 13 tonnes, is legally banned from use in nuclear weapons. However, this plutonium is not believed to be included in Russia's INFCIRC/549 declaration, and thus it is treated as part of Russia's military stock. Prior to 1994, Russia is estimated to have produced about 130 tonnes of plutonium.
- (e) Rounded.

Table 2 Status of Plutonium Production in Military Reactors in Five Acknowledged Nuclear Weapon States, end 2003

	Has Plutonium Production for Nuclear Weapons Ended?	ISIS Estimate of When Plutonium Production for Nuclear Weapons Ended	Official Announcement of End to Plutonium Production for Nuclear Weapons	Plutonium Production Continues For Non-Weapons Purposes In Former Military Plutonium Production Reactors	Number of Operating Military Reactors	Tritium and other radioisotope production in military reactors
France	Yes	1994	1996	No	2(a)	Yes
China	Yes	1991	No announcement	Perhaps	1?(b)	?
Russia	Yes	1994	1995	Yes	5(c)	Yes
United Kingdom	Yes	1989-1995	1995	Yes	4(d)	Yes
United States	Yes	1988	1992	No	0(e)	No

Notes and Comments

- (a) Since the early to mid-1990s, France has operated the two Celestin reactors only to make tritium for nuclear weapons. In the 1990s, France was reported to operate one reactor at a time to make tritium. These reactors, each with a power of 200 megawatts-thermal use highly enriched uranium fuel and thus produce little plutonium in the fuel.
- (b) China may still operate or keep on standby a military production reactor.
- (c) Russia operates a total of five military reactors. Three reactors produce weapon-grade plutonium as a by-product of continued operation to provide heat and electricity to the two closed nuclear cities Seversk and Zheleznogorsk. Combined, these three reactors produce an estimated 1.4 tonnes of weapon-grade plutonium per year. Two reactors at Mayak, each with a power of 1,000 megawatts-thermal, are dedicated to the production of tritium and other radioisotopes for civilian and military purposes. These reactors are reported to use highly enriched uranium fuel and thus produce little plutonium in the fuel.
- (d) As of the end of 2003, Britain continued to operate three of four reactors at Chapelcross in Scotland to make tritium for defense purposes. In 2004, all four Chapelcross reactors were shut down. The plutonium produced in the fuel of these reactors has been recovered at Sellafield, but any reprocessing is under Euratom safeguards and subject to IAEA inspections. Although Britain reserves the right to withdraw this plutonium from safeguards for national security reasons, it announced a policy in 1998 not to do so in practice except for small quantities that would not be used for nuclear explosive purposes. Information on any such withdrawals would be made public. The plutonium separated annually from Chapelcross irradiated fuel is believed to be included in the U.K.'s annual INFCIRC/549 declaration of civil stocks of plutonium.
- (e) The United States plans to produce tritium for nuclear weapons in commercial light water reactors.