Global Fissile Material Report 2007
Toward a Global Cleanout of Nuclear Weapon Materials

Nuclear Weapon and Fissile Material Stockpiles and Reductions

Alexander Glaser
Program on Science and Global Security, Princeton University

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# Nuclear Arsenals

*(based on estimates by the Natural Resources Defense Council)*

<table>
<thead>
<tr>
<th>Country</th>
<th>Nuclear Warheads</th>
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</thead>
<tbody>
<tr>
<td><strong>United States</strong></td>
<td>about 10,000 <em>(5000 deployed + 5000 in reserve)</em></td>
</tr>
<tr>
<td><strong>Russia</strong></td>
<td>about 10,000 <em>(large uncertainty as to number awaiting dismantlement)</em></td>
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<tr>
<td><strong>France</strong></td>
<td>348</td>
</tr>
<tr>
<td><strong>United Kingdom</strong></td>
<td>185</td>
</tr>
<tr>
<td><strong>China</strong></td>
<td>about 200</td>
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<tr>
<td><strong>Israel</strong></td>
<td>about 100</td>
</tr>
<tr>
<td><strong>Pakistan</strong></td>
<td>about 60</td>
</tr>
<tr>
<td><strong>India</strong></td>
<td>about 50</td>
</tr>
<tr>
<td><strong>North Korea</strong></td>
<td>less than 10</td>
</tr>
</tbody>
</table>
China’s Nuclear Arsenal
(based on estimates by the Natural Resources Defense Council)

Most recent values based on 2006 U.S. Department of Defense assessment
(China may not deploy tactical nuclear weapons)

China “possesses the smallest nuclear arsenal” among the nuclear weapon states of the NPT
(Ministry of Foreign Affairs of the People’s Republic of China, 2004, text mirrored at www.ipfmlibrary.org/prc04.pdf)
What Are Fissile Materials?

Material that can sustain an explosive fission chain reaction notably highly enriched uranium or plutonium (of almost any isotopic composition)
(term is not officially used by the IAEA)
Modern Thermonuclear Warhead

A modern thermonuclear warhead may contain *both* plutonium and highly enriched uranium (average estimated values are 4 kg and 25 kg of plutonium and HEU, respectively).
Highly Enriched Uranium Stockpiles

Data for Russia highly uncertain ±300 MT

Stockpile available for weapons
Naval (fresh and irradiated material)
Civilian material
Excess (mostly for blend-down)

China
20 MT*

France
30 MT*

India
0.2 MT*

Pakistan
1.3 MT*

Russia
215 MT

215 MT

640 MT*

100 MT*

30 MT*

U.K.
1.5 MT

21.9 MT

United States
146 MT

228 MT

250 MT

30 MT

NNW States
10 MT

(250 MT of HEU are equivalent to 10,000 nuclear weapons)
Civilian HEU Worldwide

Almost 100 tons of HEU remain in the civilian nuclear fuel cycle (90% in weapon states)
16 out of 56 countries with previously HEU-fueled reactors have had all civilian HEU removed
About 130 HEU-fueled research reactors remain today - half of them in Russia
Progress of Excess HEU Disposition

Most of the U.S. weapon-grade HEU has been reserved for naval fuel. None of the U.S. material downblended so far came from dismantled nuclear weapons.
Scope for Warhead and HEU Stockpile Reductions

Metric Tons HEU

- **Today**:
  - 100 civilian
  - 360 excess
  - 100 naval (irradiated)
  - 230 naval (fresh)
  - 970 weapons

- **If Russia and the U.S. reduced to 5000 warheads each**: 230
- **If Russia and the U.S. reduced to 1000 warheads each**: 230 naval (fresh) + 135 weapons
- **200 warheads each for China, Russia, the U.S., and France/U.K.**: 230

Data for Russia highly uncertain ±300 tons

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Global Stocks of Plutonium

(50 MT of plutonium are equivalent to more than 10,000 nuclear weapons)
More than 140 kg of weapon-grade plutonium will be produced annually in the blankets of the Indian Prototype Fast Breeder Reactor. If used for the weapons program, this would correspond to a five-fold increase of India’s plutonium production capacity.

Pakistan’s new reactor projects (Khushab-2 and -3) would at least triple current plutonium production rates.
Scope for Warhead and Plutonium Stockpile Reductions

- **Today**: 62 tons weapons, 110 tons excess, 240 tons total
- **If Russia and the U.S. reduced to 5000 warheads each**: 24 tons weapons, 145 tons excess, 240 tons total
- **If Russia and the U.S. reduced to 1000 warheads each**: 24 tons weapons, 240 tons excess, 240 tons total
- **200 warheads each for China, Russia, the U.S., and France/U.K.**: 5 tons weapons, 240 tons excess, 240 tons total

Data for Russia highly uncertain: ±25 tons

Metric tons plutonium
In the 1990s, U.S. warhead dismantlement rates were almost 5x higher than they are today.

Resources are primarily going to “life extension programs.”
## Conclusion

### Existing Fissile Material Stockpiles

- Dominated by Russia and the United States
  - *(and still large enough for 20-40,000 nuclear weapons)*

- Disposition of excess stocks has been slower than anticipated in the 1990s
  - *(with the exception of Russian HEU downblending)*

- Production of fissile material stopped in the nuclear weapon states of the NPT
  - Emerging fissile material arms race in South Asia

### Roadblocks to Reductions in Fissile Materials and Nuclear Weapons

- Global stockpile of fissile material highly uncertain, primarily due to lack of information on Russia
  - *(Example of the U.K. and the U.S. with both plutonium and HEU holdings declared)*

- Large naval HEU and growing civilian plutonium stockpiles