Rationale For Eliminating the Civil Use of HEU

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Technologies for Terrorism:

- Chemical High Explosives
- Chemical Weapons
- Radiological Dispersal Devices
- Biological Weapons
- Nuclear Explosive Devices

Alternatives for Obtaining a Nuclear Explosive Device

Be Given, Buy or Steal:

- An Intact Nuclear Weapon
- Explosive Fissionable Materials
  - ➢ Plutonium
  - ➢ HEU

Gauging Risk:

- No historical cases of intact nuclear weapons being given to, stolen or purchased by terrorists
- Nuclear weapons have greater physical security than fissile material, typically weigh > 100 kg; have internal security systems (e.g., PALs); possess strong radiological signatures
- Since the collapse of the Soviet Union there have been a handful of cases involving the diversion of less than weapon quantities of explosive fissionable materials from institutes in the Former Soviet Union
- International Atomic Energy Agency statistics (1993-2006): 275 confirmed incidents involving nuclear material and criminal intent occurred globally – 4 involved plutonium, but 14 involved HEU
- More than 40 countries harbor HEU

HEU vs Plutonium

Relative to Plutonium, HEU is

- More Plentiful
- More Dispersed
- Less Secure
- Easier to Handle
- Harder to Detect
- Easier to Fabricate into a Crude Nuclear Explosive Device (*although Plutonium has a Smaller Critical Mass)*

Gun-Assembly vs Compression

Two Classic Approaches to Fission Weapon Design

- Gun Assembly: Easier to Fabricate
- Compression: Less Fissile Material Required

Crude HEU Gun-Assembly Device

In 1987 Nobel laureate physicist and Manhattan Project scientist Luis Alvarez wrote that if terrorists had modern weapon-grade uranium, they "…would have a good chance of setting off a high-yield explosion simply by dropping one half of the material on the other half."

HEU “Gun Assembly”

To achieve a good chance of at least a kiloton yield with about two critical masses of HEU neither a gun nor gun propellant is needed.

A one kiloton ground burst can produce Hiroshima-level casualties

A commercial license to possess about two critical masses of HEU is a commercial license to possess a nuclear explosive device capable of achieving Hiroshima-level casualties.

HEU is Simply Too Risky:
Production and Commercial Use of HEU Must be Banned Globally