The Next Step for Arms Control

A Nuclear Control Regime

Jan Lodal and Richard Burt

The Brookings Institution
June 28, 2012
A Chain Reaction of Proliferation

"The Nuclear Express," a new book on the history of the atomic age, describes the interlocking web of influence and espionage behind the proliferation of nuclear technology. This diagram gives a summary of the authors' tracking of the transfers of nuclear technology and secrets.

Nuclear states
Circles represent nuclear states, arranged on the timeline by the year of first nuclear detonation (or, for Israel and South Africa, the year they could have tested). Connections show the flow of information and technology, by intended transfer, leak or espionage. Some were one-way transfers; others were two-way.

Sources: Thomas C. Reed and Danny B. Stillman

Aspiring states
Squares represent states that the authors say have embryonic nuclear weapons programs. Other states, not shown, that have ended their weapons programs include Sweden (1970), Switzerland and Taiwan (1988), and Argentina and Brazil (1994).
Civilian Highly Enriched Uranium (HEU)

Plutonium Declared to IAEA

Source: International Panel on Fissile Materials
Highly Enriched Uranium

Source: International Panel on Fissile Materials

- **Red Circle**: Some unsafeguarded material
- **Gray Circle**: Safeguarded
Plutonium

Source: International Panel on Fissile Materials

- = Safeguarded
- = Some unsafeguarded material
Security of global weapons-usable nuclear materials

2011, 100 most favourable security conditions

<table>
<thead>
<tr>
<th>Country</th>
<th>Quantity of nuclear materials*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>5-20kg</td>
</tr>
<tr>
<td>Hungary</td>
<td>1-5kg</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>5-20kg</td>
</tr>
<tr>
<td>Switzerland</td>
<td>21-99kg</td>
</tr>
<tr>
<td>Austria</td>
<td>5-20kg</td>
</tr>
<tr>
<td>Netherlands</td>
<td>0.5-1.99 tonnes</td>
</tr>
<tr>
<td>Sweden</td>
<td>1-5kg</td>
</tr>
<tr>
<td>Poland</td>
<td>1-5kg</td>
</tr>
<tr>
<td>Norway</td>
<td>5-20kg</td>
</tr>
<tr>
<td>Canada</td>
<td>100-4999 tonnes</td>
</tr>
<tr>
<td>Germany</td>
<td>10-99.99 tonnes</td>
</tr>
<tr>
<td>Britain</td>
<td>100-4999 tonnes</td>
</tr>
<tr>
<td>Belgium</td>
<td>0.5-1.99 tonnes</td>
</tr>
<tr>
<td>United States</td>
<td>≥500 tonnes</td>
</tr>
<tr>
<td>Ukraine</td>
<td>100-4999 tonnes</td>
</tr>
<tr>
<td>Argentina</td>
<td>5-20kg</td>
</tr>
<tr>
<td>Belarus</td>
<td>100-4999 tonnes</td>
</tr>
<tr>
<td>Italy</td>
<td>100-4999 tonnes</td>
</tr>
<tr>
<td>France</td>
<td>100-4999 tonnes</td>
</tr>
<tr>
<td>Mexico</td>
<td>5-20kg</td>
</tr>
<tr>
<td>South Africa</td>
<td>0.5-1.99 tonnes</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>10-99.99 tonnes</td>
</tr>
<tr>
<td>Japan</td>
<td>10-99.99 tonnes</td>
</tr>
<tr>
<td>Russia</td>
<td>≥500 tonnes</td>
</tr>
<tr>
<td>Israel</td>
<td>0.5-1.99 tonnes</td>
</tr>
<tr>
<td>Uzbekistan</td>
<td>21-999g</td>
</tr>
<tr>
<td>China</td>
<td>10-99.99 tonnes</td>
</tr>
<tr>
<td>India</td>
<td>2-9.99 tonnes</td>
</tr>
<tr>
<td>Vietnam</td>
<td>5-20kg</td>
</tr>
<tr>
<td>Iran</td>
<td>5-20kg</td>
</tr>
<tr>
<td>Pakistan</td>
<td>2-9.99 tonnes</td>
</tr>
<tr>
<td>North Korea</td>
<td>21-999g</td>
</tr>
</tbody>
</table>

Source: Nuclear Threat Initiative, Economist Intelligence Unit

*Highly enriched uranium, separated plutonium and unirradiated mixed oxide
Arms Control Agenda

- Deeper US-Russia reductions
- Nuclear Nonproliferation Treaty
- Fissile Materials Treaty
- Comprehensive Nuclear Test-Ban Treaty
- Nuclear Suppliers Group
- IAEA Efforts: INFCIRC 225, Add. Protocol
- Convention for the Suppression of Acts of Nuclear Terrorism
- Convention on the Physical Protection of Nuclear Material
- Nuclear Security Summit
A successful approach:
- Comprehensive
- Universal
- Enforceable
Comprehensive

- All HEU and Plutonium, no exceptions
- Include material in military use (relying on inventory control with challenge inspections for warheads)
Universal

- Logic of nuclear deterrence: one unsafeguarded program would threaten others
- Selective obligations make for difficult diplomacy
- Better safety and security needed for all states
Enforceable

- Not effective without consequences for rule-breakers
- Need veto-free UN Authority
- Enforcement in four stages:
  1. International monitoring
  2. Determination if violation has occurred
  3. Agency definition of enforcement options
  4. Enforcement by UNSC-authorized coalition
Add:

Enforcement
Verification of all military related nuclear material

Package with:

IAEA Additional Protocol
Nuclear Suppliers Group guidelines
UNSCR 1540
Convention on Physical Protection of Nuclear Material

Foundation:
International Atomic Energy Agency
Nuclear Nonproliferation Treaty
2012 Seoul Summit

Modest voluntary commitments

Entry into force by 2014 of Convention for the Physical Protection of Nuclear Materials

National pledges to eliminate weapons material
A Global Nuclear Control Regime is necessary.

- To keep terrorists from getting fissile material
- To prevent a second A.Q. Khan network
- To help verify a path to global zero
- To create a framework for other initiatives
- To remove diplomatic barriers to progress
Wrap-up

• **Current Efforts are Inadequate. Results will be**
  • Not Comprehensive
  • Not Universal
  • Not Enforcable

• **The New Regime will not constrain any state's nuclear program**

• **The basis for verification is in place**

• **The U.S. must lead by accepting the rules**

• **As more states accede, pressure on outliers can be increases**

• **The alternative is a terrorist bomb**