Elements of a Fissile Material Cut-off Treaty

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Recent FM(C)T developments

- Group of Governmental Experts
- High Level Expert Preparatory Group
- Draft treaty submitted by France
- Draft treaty prepared by the International Panel on Fissile Materials
The FM(C)T triangle

• Definitions
  • What is fissile material?

• Verification
  • Focused or comprehensive approach?

• Scope
  • How the treaty should treat existing stocks?
What is fissile material?

<table>
<thead>
<tr>
<th>Fissile material</th>
<th>Article XX of the IAEA Statute</th>
<th>All enriched uranium (including LEU)</th>
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<tbody>
<tr>
<td></td>
<td>All plutonium (separated or in spent fuel)</td>
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<tr>
<td></td>
<td>Unirradiated direct use material</td>
<td>Highly enriched uranium (&gt;20% U-235 or U-233)</td>
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<td></td>
<td>Weapon-grade material</td>
<td>Weapon-grade HEU (&gt;90% U-235)</td>
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<tr>
<td></td>
<td>Weapon-grade material</td>
<td>Separated weapon-grade plutonium</td>
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<td></td>
<td>Intermediate-grade material</td>
<td>Excludes naval HEU (up to ~60% U-235)</td>
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<tr>
<td></td>
<td>Excludes reactor-grade plutonium</td>
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<td></td>
<td>Other definitions</td>
<td>May include Np, Am</td>
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How to ban the production of fissile material for weapons?

• Fissile material that is produced (or acquired from any source) should be declared and submitted to verification

• Verification system is designed to ensure that
  • Submitted material is not used for nuclear weapons
  • Once submitted, material cannot be withdrawn
  • No material is produced clandestinely
Components of the verification system

• Verification at production facilities
  • All produced material is declared and submitted to verification

• Downstream verification
  • Fissile material is not withdrawn or diverted
  • Fissile material is not used for weapon purposes

• Detection of undeclared production
  • No covert production facilities
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Production and production facilities

• Production is any activity or process that produces fissile materials

• Production facility is any facility that is capable of producing fissile materials
Verification at production facilities

• Procedures would have to be facility-specific

• Declare facilities that are capable of producing fissile materials

• Implementing organization decides on specific verification measures
  • Some facilities may be exempt (laboratory-scale, converted, shut down, dismantled etc.)
Components of the verification system

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• Downstream verification
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Downstream verification

• Once submitted, material cannot be withdrawn

• Material cannot be used for weapon purposes

• Non-proscribed military uses may require a special arrangement
  • Military naval reactors, military research reactors
  • Material should not be withdrawn from verification

• Transfers to other states
Components of the verification system

• Verification at production facilities
  • All produced material is declared and submitted to verification

• Downstream verification
  • Fissile material is not withdrawn or diverted
  • Fissile material is not used for weapon purposes

• Detection of undeclared production
  • No covert production facilities
Detection of undeclared production

• Undeclared production at declared production facilities
  • Should be prevented by facility-specific verification measures
  • May require “upstream” verification arrangements

• Undeclared facilities
  • May require non-routine inspections and other measures
Existing stocks

• FM(C)T would create a system for handling newly produced materials

• Same system will be able to handle existing materials

• Any existing material can be submitted to verification
  • Material voluntarily declared excess
  • ”Disarmament material”
Benefits of the FM(C)T

• No production of fissile materials for weapons

• Monitoring of all facilities capable of producing fissile materials

• Verification system that can eliminate existing stocks

• Verified declarations of existing stocks
Fissile Material (Cut-off) Treaty:
Elements of the Emerging Consensus

Pavel Podvig
UNIDIR

The discussion of the Fissile Material (Cut-off) Treaty has reached a point of a broad agreement on a number of the elements of the future treaty. Although States still hold different views on some of the key issues, such as the definition of fissile material or the scope of the treaty, there appears to be a convergence of views on the meaning of the treaty obligations, of the general structure of the treaty, and of the basic characteristics of the verification system that the treaty will create. This paper presents the elements of this emerging consensus. The focus on the points of agreement helps emphasize the remaining differences and make clear the nature of the compromises that would be required to successfully negotiate a viable treaty.

Deferred Verification
Verifiable Declarations of Fissile Material Stocks

Pavel Podvig and Joseph Rodgers
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The report describes a verification arrangement that would allow the future Fissile Material Cut-off Treaty to include declarations of existing fissile material stocks covering all categories of materials, including materials in nuclear weapons. This arrangement, referred to as "deferred verification," would allow declarations to be legally binding and verifiable. Combined with a ban on the production of new materials that would be established by the FMCY, this arrangement could support verification of initial declarations of fissile material stocks and the gradual elimination of all weapons-related fissile materials.