

DRAFT FOR DISCUSSION PREPARED BY  
THE INTERNATIONAL PANEL ON FISSILE MATERIALS

## **A Fissile Material (Cut-Off) Treaty**

**A Treaty Banning the Production of Fissile Materials  
for Nuclear Weapons or Other Nuclear Explosive Devices**

**with article-by-article explanations**

2 September 2009

International Panel on Fissile Materials  
[www.fissilematerials.org](http://www.fissilematerials.org)

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## Introduction

A treaty banning the production of fissile materials<sup>1</sup> for nuclear weapons is essential to constraining nuclear arms races and to achieving the goal of nuclear disarmament. Negotiation of such a treaty was endorsed without a dissenting vote in 1993 by the United Nations General Assembly.<sup>2</sup>

The Review Conference of the Parties to the Non-Proliferation Treaty (NPT) in 2000 agreed that negotiations “on a non-discriminatory, multilateral and internationally and effectively verifiable treaty banning the production of fissile materials for nuclear weapons or other nuclear explosive devices” should commence immediately in the multilateral Conference on Disarmament (CD) in Geneva, “with a view to their conclusion within five years.”<sup>3</sup> Nevertheless, the CD has, for various reasons, not yet formally launched negotiations on such a treaty.

In the discussion of the proposed treaty at the CD, two issues have been especially contentious: verification and pre-existing stocks. The debate over whether the treaty should involve a ban on the use of some pre-existing stocks for weapons has even led to the use of two different names for the proposed treaty: Fissile Material Cutoff Treaty and Fissile Material Treaty. Here, we will use a name that makes this unresolved issue explicit: Fissile Material (Cutoff) Treaty, or FM(C)T.

We present below a draft FM(C)T based on discussions within the International Panel on Fissile Materials (IPFM). It is an alternative to the draft treaty with limited scope and without verification submitted by the Bush Administration to the CD on May 18, 2006.

**Verification.** There are strong reasons to prefer a verified treaty:

- Agreed verification measures are essential to creating confidence and trust in an FM(C)T;
- The non-nuclear-weapon states (NNWS) Parties to the Non Proliferation Treaty (NPT) have accepted comprehensive safeguards, implemented by the International Atomic Energy Agency (IAEA), on their civilian nuclear programs to verify their commitments not to divert nuclear materials to weapons. Many of these states have repeatedly expressed concerns that, because the nuclear-weapon states are not required to have similar safeguards on their civilian nuclear activities, the NPT puts NNWS at a competitive disadvantage in the development

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<sup>1</sup> Fissile materials are materials that can sustain a fission chain reaction, in practice, primarily plutonium and highly enriched uranium.

<sup>2</sup> UN General Assembly Resolution 48/75L, 1993, [www.ipfmlibrary.org/unga4875.pdf](http://www.ipfmlibrary.org/unga4875.pdf).

<sup>3</sup> 2000 NPT Review Conference Final Document, “Article VI and Preambular, Paragraphs 8 to 12,” 15.3, see e.g. [www.armscontrol.org/act/2000\\_06/docjun.asp](http://www.armscontrol.org/act/2000_06/docjun.asp).

of civilian nuclear power. A verified FM(C)T would go far toward redressing this inequity; and

- Interest in nuclear disarmament has recently revived. Much deeper cuts in the nuclear stockpiles will require expanded inspections of nuclear activities in the states possessing nuclear weapons. International verification of an FM(C)T would make an important contribution to establishing an effective verification system for future nuclear disarmament measures.

The IPFM believes that an FM(C)T could be verified as effectively as the Nonproliferation Treaty. Our draft treaty therefore requires verification. As with the NPT, the draft treaty calls upon the IAEA to implement the needed verification arrangements, but these arrangements are not spelled out in the treaty itself.<sup>4</sup> The Panel has developed specific ideas on verification, however. Some of these have been laid out in our *Global Fissile Material Report 2008 (GFMRO8)*.<sup>5</sup>

There are compelling reasons for the IAEA to take on responsibility for verification. The IAEA has extensive experience in inspecting nuclear installations and nuclear materials, including in the NPT nuclear-weapon states under their voluntary safeguards agreements. The obligations of nuclear-weapon states under the FM(C)T will overlap strongly with the obligations of non-weapon states under the NPT and will become more similar as nuclear disarmament proceeds. The IAEA, advised by national experts, might begin the development of a model protocol in advance of the completion of an FM(C)T.

To undertake the new responsibilities, the IAEA's Safeguards Division will have to grow substantially. Additional funding will be required for such an expansion but it will be miniscule in comparison, for example, with the cost either of nuclear-weapon programs or of the production of nuclear energy.<sup>6</sup>

***Pre-existing stocks.*** The FM(C)T could focus exclusively on a cut-off of future production of fissile materials for nuclear weapons or other nuclear explosive devices – or it could include also undertakings not to use for weapons pre-existing non-weapon stocks of fissile materials, including civilian stocks, stocks declared excess to military purposes, and stocks of highly enriched uranium declared for use as fuel for naval-propulsion and other military reactors.

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<sup>4</sup> In contrast, both the Chemical Weapons Convention and the Comprehensive Nuclear-Test-Ban Treaty have extensive verification provisions in the treaty texts.

<sup>5</sup> *Global Fissile Material Report 2008: Scope and Verification of a Fissile Material (Cutoff) Treaty*, available at [www.fissilematerials.org](http://www.fissilematerials.org).

<sup>6</sup> IAEA expenditures on safeguards in 2007 were \$0.115 billion, *IAEA Annual Report, 2007*, Tables A1 and A2. Estimated U.S. expenditures on nuclear weapons and related programs in fiscal year 2008 were \$52.8 billion, Stephen Schwartz and Deepti Choubey, *Nuclear Security Spending: Assessing Costs, Examining Priorities* (Carnegie Endowment, 2009). One hundred million dollars per year would correspond to 0.004 cents per nuclear kilowatt-hour, about one thousandth the generation cost of nuclear electricity, for the 2,608 billion kilowatt-hours of nuclear electricity produced in 2007, *Energy, Electricity and Nuclear Power Estimates for the Period up to 2030* (IAEA, 2008), Table 4.

In a verified treaty, future production of fissile material for civilian purposes would in any case be under safeguards to prevent this material from being used in weapons. It would be unnecessarily complicated to keep separate unsafeguarded pre-existing civilian fissile material and safeguarded post-treaty civilian fissile material. It would be better to ask countries to decide at the beginning what pre-existing fissile material they wished to keep available for weapons and to put all other fissile materials under international safeguards. The IPFM's draft Treaty therefore requires states to separate military materials from their civilian nuclear sectors before the Treaty comes into force for them.

The draft Treaty also asks states to declare and submit to IAEA monitoring fissile materials from weapons that are excess to their military requirements, as well as future excess materials resulting from unilateral, bilateral, or multilateral nuclear disarmament measures.

A system could also be developed that would place under IAEA monitoring fissile material stored for future use as fuel for naval-propulsion or other military reactors. Such a system will in any case have to be developed if, after the FM(C)T comes into force, HEU is produced for military reactors.

Below, we present the draft IPFM Treaty article-by-article in italics within boxes, followed, where necessary, by brief explanations of the choices we have made.

**Draft Treaty and Article-by-Article Explanation*****Preamble***

*The States Parties to this Treaty (hereinafter referred to as “the States Parties”),*

*a) Certain of the unparalleled dangers that nuclear weapons pose to humankind and the environment, and of the consequent need to achieve the total elimination of nuclear weapons, the prevention of further proliferation of nuclear weapons and the prevention of nuclear terrorism,*

*b) Desiring to facilitate the cessation of the manufacture of nuclear weapons, the liquidation of existing stockpiles, and the elimination from national arsenals of nuclear weapons and the means of their delivery,*

*c) Confident that the participation of all States in a treaty banning the production of fissile material for nuclear weapons or other nuclear explosive devices, taking into consideration both disarmament and nonproliferation objectives, will serve to lay the basis for the irreversible reduction of the stocks available for nuclear weapons through permanent transfers of fissile materials to non-weapon use or disposal,*

*d) Convinced that actions by and agreements between relevant States on their stocks of fissile materials including their size, disposition and protection, would contribute to achieving the goals of this Treaty,*

*e) Committed to ensuring that the peaceful use of nuclear energy should not contribute to the manufacture of nuclear weapons and that fissile material used for peaceful purposes should be protected from diversion or theft for use in the manufacture of nuclear weapons or other nuclear explosive devices or for purposes unknown, and that strong international cooperation is needed in this respect,*

*f) Desiring in this connection that the use of highly enriched uranium for peaceful purposes and for military non-explosive use be minimized and in time abandoned, and seeking to universalize the commitment made by certain countries in 1997 to minimizing stockpiles of separated civilian plutonium,<sup>i</sup>*

*g) Recognizing that the International Atomic Energy Agency (hereafter called the IAEA) is the appropriate body to undertake the verification of this Treaty, and*

*h) Determined that all nuclear materials in all States be progressively brought under effective non-discriminatory comprehensive verification measures.*

*Have agreed as follows:*

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i. Belgium, China, France, Germany, Japan, Russia, Switzerland, the United Kingdom, the United States,

The Preamble explains the purpose of the Treaty and how it fits into a broader context, in this case the ultimate goal of nuclear disarmament, and the desirability of future steps towards that goal. It uses relevant aspirational language from other treaties, resolutions and relevant declarations.

**Paragraph a)** describes the dangers of nuclear weapons and the consequent need to work on nuclear disarmament and nonproliferation measures and the prevention of nuclear terrorism.

**Paragraph b)** mentions the main goals of the Treaty: to contribute to the halting in the production of new nuclear weapons and the dismantlement of existing nuclear weapons. The need for destruction of dedicated nuclear-weapon delivery systems is also mentioned. These objectives are also called for in the Nonproliferation Treaty

**Paragraph c)** underlines the desirability that all States participate in a treaty that ends the production of fissile materials for weapons and provides for their irreversible transfer to non-weapon use or disposal.

**Paragraph d)** notes that the Treaty does not include specific commitments to declare or reduce the sizes of existing stocks of fissile materials available for nuclear weapons. It strongly emphasizes, however, that bilateral and multilateral agreements between relevant states on such declarations and reductions would greatly assist in attaining the goals of this Treaty.

**Paragraph e)** underlines the need to ensure that the use of nuclear energy for peaceful purposes does not contribute to the manufacture of nuclear weapons. This is a general objective but also relates to the intensive discussions in recent years of multilateral alternatives to national nuclear programs for uranium enrichment and spent fuel storage and reprocessing. The paragraph also emphasizes the need for strict physical protection of fissile materials. On all these matters, international cooperation needs to be strengthened, especially if the use of nuclear energy expands in the coming decades.

**Paragraph f)** points to the particular risks posed by the use of fissile materials in the nuclear fuel cycle, which lowers the barrier between peaceful uses of nuclear energy and nuclear explosives. The use of highly enriched uranium (HEU), of which nuclear explosives can be made relatively easily (including by non-state actors) and which is not needed for the production of electric power and for which low-enriched uranium can increasingly be substituted in other uses, should be phased out. The same holds for the use of HEU in military (mostly propulsion) reactors. The paragraph also stresses the need for minimizing stockpiles of separated plutonium in the civilian fuel cycle, referring to a commitment made by a number of relevant States. More needs to be done in this field, in view of the fact that, despite these commitments, the global stock of separated civilian but weapon-usable plutonium today is about as large as weapon stocks of plutonium and could soon become larger as weapon stocks are reduced.

**Paragraph g)** states that the IAEA should apply the verification measures required by this Treaty. Since these verification measures are the same or extensions of existing safeguards measures already applied by the IAEA in non-weapon states under the Nonproliferation Treaty, it would be extremely inefficient to establish a new verification organization for this Treaty.

**Paragraph h)** underlines the objective that, step-by-step, all fissile materials in all states should come under the same strict verification regime. This could only be fully accomplished when comprehensive nuclear disarmament is achieved but this Treaty is an important step towards that goal.

### ***Article I: Basic Undertakings***

***I.1. Each State Party undertakes not to produce fissile material for nuclear weapons or other nuclear explosive devices.***

***I.2. Each State Party undertakes not to acquire from any source or to transfer to any recipient fissile material for nuclear weapons or other nuclear explosive devices;***

***I.3 Each State Party undertakes not to assist, induce or encourage in any way anyone to engage in any activity prohibited under this Treaty;***

***I.4. Each State Party undertakes either to promptly disable and decommission and, when feasible, dismantle its fissile-material production facilities, or to reconfigure and use these facilities only for peaceful or military non-explosive purposes.***

***I.5. Each State Party undertakes to declare to the IAEA and not to use for nuclear weapons or other nuclear-explosive devices all fissile materials:***

- i. In its civilian nuclear sector***
- ii. Declared as excess for all military purposes***
- iii. Declared for use in military reactors.***

***I.6. Each State Party undertakes that any reduction in its stockpile of nuclear weapons will result in a declaration of the fissile material recovered from those weapons as excess for weapon purposes.***

**Article I.1** sets out the *cutoff* obligations of the Treaty. The ban of the production of fissile material is only for direct use in weapons or other nuclear-explosive devices. This recognizes that some states choose to separate plutonium for recycle in civilian power reactors and/or produce highly enriched uranium (HEU) to fuel naval and/or tritium-

production reactors. Any production of fissile material, after the treaty comes into force, would have to be under IAEA safeguards. A more far-reaching treaty could ban production of fissile materials for a larger range of military purposes or even all purposes.

*Article I.2* is a non-circumvention requirement, adding to the ban on production a prohibition on the acquisition of fissile materials for weapons purposes by other means, as well as transfers for weapon use to other states or non-state actors. Transfers of fissile materials between states for weapons use have reportedly occurred in the past.

*Article I.3* adds the requirement not to assist, induce or encourage other states or non-state actors to engage in activities that are prohibited by the Treaty.

*Article I.4* requires that reprocessing facilities and enrichment plants that have been used to produce fissile materials for weapons be converted to the production of material for civilian or military non-explosive uses or be shut down and decommissioned and ultimately dismantled. The purpose is to avoid having unnecessary production facilities kept in a standby mode.

*Article I.5* requires that all fissile materials not in weapons or committed to potential weapons-use be declared to the IAEA in the same manner as fissile material in non-nuclear-weapon states that are parties to the NPT. By making this declaration, a country defines its non-weapons stockpiles.

*Sub-article I.5.i* requires that fissile materials in the civilian sectors of the Parties at the time the Treaty comes into force may not be used in nuclear weapons. Without this obligation, fissile material in the civilian sector produced before the Treaty's entry into force for a country could be used for nuclear weapons and, for a verified treaty, it would be necessary to undertake and maintain a complex segregation of fissile materials in the civilian sectors according to whether they were produced post- or pre-Treaty. It would be far simpler for a country, before joining the Treaty, to segregate all pre-existing fissile material for which it wants to preserve the option of weapon use. To the IPFM's knowledge, all plutonium that has been separated primarily for weapons— as distinguished from nuclear-fuel purposes -- contains more than 90 percent Pu-239. To prevent plutonium containing less than 90 percent Pu-239 from being used for weapons, it should be included in the plutonium that is declared civilian.

*Sub-article I.5.ii* requires that all fissile materials declared excess to weapons and other military purposes remain so irreversibly. The Russian Federation, the United Kingdom, and the United States, the countries that have made such declarations, have committed that they are irreversible. This obligation reiterates one of the Thirteen Steps agreed at the NPT Review Conference in 2000, namely “Arrangements by all nuclear-weapon States to place, as soon as practicable, fissile material designated by each of them as no longer required for military purposes under IAEA or other relevant international verification and

arrangements for the disposition of such material for peaceful purposes, to ensure that such material remains permanently outside of military programmes.”<sup>7</sup>

***Sub-article I.5.iii.*** The United States has declared a large stock of HEU excess for weapon use but has reserved much of it for future use as fuel for naval-propulsion reactors. The quantities involved are comparable to those in the weapon stockpiles (see *GFMRO8*, chapter 1) and could become an obstacle to further reductions unless made unavailable for weapons purposes. Other states may do the same. They could also reserve HEU to fuel reactors for other military purposes that are not banned by the Treaty, such as producing tritium for nuclear weapons. This sub-paragraph requires that this material—although reserved for military purposes—will not be used in nuclear weapons or other nuclear-explosive devices.

***Article I.6.*** would require States Party to declare excess for weapon purposes fissile material recovered from reductions in their nuclear-warhead stockpiles through unilateral actions or bilateral or multilateral agreements and arrangements. After it has been converted to unclassified form, this material would be placed under the same IAEA safeguards that are used for civilian materials. It could also come under IAEA monitoring at an earlier stage with arrangements to protect classified information (see *GFMRO8*, Chapter 6). It could subsequently be used for either civilian or military non-explosive purposes (see also the discussion of Article III.3.ii.c below).

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<sup>7</sup> 2000 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons *Final Document*, Volume 1, NPT/CONF.2000/28 (Parts I and II), New York, 2000.

**Article II: Definitions**

**II.1. “Fissile material” means:**<sup>ii</sup>

*i) Plutonium of any isotopic composition except plutonium that contains 80 percent or more plutonium-238*

*ii) Uranium containing uranium-235 and/or uranium-233 in a weighted concentration equivalent to or greater than 20 percent uranium-235.*<sup>iii</sup>

*iii. Any other fissile material suitable for the manufacture of nuclear weapons as agreed to in a protocol to this Treaty.*

*iv. Material containing any combination of the foregoing.*

**II.2. “To produce fissile material” means:**

*i. To separate fissile materials from irradiated nuclear material through reprocessing or any other process*

*ii. To increase the weighted concentration of uranium-235 and uranium-233 of any mixture of uranium isotopes to a level equivalent to or greater than 20 percent*

*iii. To increase the fraction of plutonium-239 in plutonium by any isotopic separation process.*

**II.3. A “production facility” means any facility capable of producing more than [one tenth] of a significant quantity of fissile material per year.**

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 ii. See the corresponding definition of “direct use” material in: *IAEA Safeguards Glossary, 2001 Edition*, International Nuclear Verification Series, No. 3, International Atomic Energy Agency, Vienna, 2002, §4.25,

iii. The weighting is as follows:  $F_{235} + (5/3) F_{233}$ , where  $F_{235}$  is the fraction of U-235 atoms in the mix and  $F_{233}$  the fraction of U-233 atoms.

**Sub-article II.1.i.** The definition of plutonium conforms to the IAEA definition of “direct-use material,” i.e. “nuclear material that can be used for the manufacture of nuclear explosive devices without transmutation or further enrichment.”<sup>8</sup> Plutonium containing more than 80 percent Pu-238 is used in thermoelectric generators for space and other applications and generates so much radioactive decay heat that it is considered unusable as a weapons material.

**Sub-article II.1.ii.** The IAEA defines a mixture of uranium-235 and uranium-238 enriched to 20 percent or more in U-235 to be “direct use material.”<sup>9</sup> It also defines U-233 to be a direct-use material.<sup>10</sup> It does not, however, define which mixtures of uranium

<sup>8</sup> *IAEA Safeguards Glossary, op. cit.*

<sup>9</sup> *Ibid.*

<sup>10</sup> The United States carried out a nuclear weapon test on 15 April 1955 (the MET test in the “Teapot” series) using a composite plutonium and uranium-233 core, with a yield of 22 kilotons, see

isotopes containing U-233 would be considered weapon usable, Since a mixture of 12-percent U-233 with U-238 has the same critical mass as a mixture of 20-percent U-235 with U-238, we have assumed that each atom of U-233 is equivalent to  $20/12 = 5/3$  atoms of U-235.<sup>11</sup>

**Sub-article II.1.iii.** Although the most common fissile materials are highly enriched uranium (HEU) and plutonium, neptunium-237 and americium also could be used for weapons manufacture and are therefore sometimes referred to as “alternative nuclear [weapon] materials” (see *GFMRO8*, Appendix).<sup>12</sup> These are not currently defined as “special fissionable materials” in the IAEA Statute or covered by IAEA safeguards under the INFCIRC/153 model safeguards agreement between the IAEA and non-nuclear-weapon states.

**Article II.2** defines the production of fissile material as either:

- Its separation from irradiated nuclear material; or
- The enrichment of uranium in the isotopes U-235 and/or U-233 to the equivalent of 20 or more percent of U-235; or
- The enrichment of plutonium in the isotope Pu-239.

The effect is to prohibit not only the production of highly enriched uranium or plutonium for nuclear weapons or nuclear explosive devices but also the further enrichment for these purposes of pre-existing highly enriched uranium or plutonium. Thus, for example, a State Party may not increase the enrichment of uranium-235 in unsafeguarded HEU from 21 to 90-percent U-235 for nuclear explosive purposes or the enrichment of plutonium in plutonium-239.<sup>13</sup> It would be permitted, however, to chemically purify fissile materials of their decay products, e.g. americium-241 in the case of weapons plutonium. The decay of Pu-241 into Am-241 simply represents the natural transformation of one nuclear material from another and its separation does not constitute production.

**Article II.3** defines facilities that can produce fissile materials, i.e., enrichment and reprocessing facilities, including hot-cells with reprocessing capabilities. Some threshold production capacity will have to be specified to avoid capturing facilities such

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www.nuclearweaponarchive.org. There may have been other tests using uranium-233; T. B. Cochran, W. Arkin, and M. M. Hoenig, *U.S. Nuclear Forces and Capabilities*, Nuclear Weapons Databook, Vol. 1, Ballinger, Cambridge, 1984, p. 23. See also, D. R. Tousley, C. W. Forsberg, and A. M. Krichinsky, “Disposition of Uranium-233,” International High-Level Radioactive Waste Management Conference, American Nuclear Society, Las Vegas, Nevada, 11–14 May 1998.

<sup>11</sup> See e.g. the curves showing critical masses of U-235/U-238 and U-233/U-238 mixtures as a function of enrichment in Jungmin Kang and Frank von Hippel, “U-232 and the Proliferation-resistance of U-233 in Spent Fuel,” *Science & Global Security*, Vol. 9, 2001, Figure 7.

<sup>12</sup> *IAEA Safeguards Glossary*, *op. cit.*, §4.18 and §4.19

<sup>13</sup> The US developed laser enrichment of plutonium at the Livermore National Laboratory in the 1980s.

as mass spectrometers that can separate isotopes but at insignificant rates. If other fissile material were added, it would be necessary for the IAEA to define a significant quantity in each case. For Np-237, Am-241 and Am-243, currently defined by the IAEA as “alternative nuclear materials,” the unreflected critical masses are approximately 60, 60 and 200 kg respectively. For comparison, the unreflected critical mass of U-235 is about 50 kg and the significant quantity is defined as 25 kg.

### ***Article III: Verification***

***III.1.*** Each State Party undertakes to accept IAEA safeguards to verify compliance with its obligations under Article I as described in this Article.

***III.2.*** States Parties that have in force with the IAEA a comprehensive safeguards agreement that satisfies the requirements of IAEA-document INFCIRC/153 (corrected) and an Additional Protocol that satisfies the requirements of INFCIRC/540 (corrected), have no further verification obligations under this Treaty, unless that State Party intends to use fissile materials for military non-explosive purposes, or that state has more than [one tenth] of a significant quantity of the fissile materials referred to in Article II.1.iii, in which case additional safeguards or arrangements are needed.

***III.3.*** States Parties not having a comprehensive safeguards agreement with the IAEA and possessing at least one significant quantity of unsafeguarded fissile material undertake to accept safeguards in an appropriate safeguards agreement to be concluded with the IAEA to verify their obligations under Article I, including:

***i)*** The non-production of fissile materials for nuclear weapons or other nuclear explosive devices and to that end:

- a)*** The disablement, decommissioning and dismantlement of production facilities or their use only for peaceful or military non-explosive purposes, and
- b)*** The absence of any production of fissile materials without safeguards.

***ii)*** The non-diversion to nuclear weapons, other nuclear explosive devices or purposes unknown of:

- a)*** All civilian fissile materials, including in spent fuel,
- b)*** All fissile materials declared excess to any military purpose.
- c)*** All fissile materials declared for military non-explosive purposes

***III.4.*** Negotiation of agreements and arrangements referred to in Paragraph III.2 and III.3 shall commence, based on a Model Safeguards Agreement, within [180] days from the entry into force of this Treaty. For States depositing their instruments of ratification or accession after the [180]-day period, negotiation of such agreements or arrangements shall commence not later than the date of such deposit. Negotiations of these agreements and arrangements shall be conducted in consultation with the Executive Secretary. Such agreements or arrangements shall enter into force not later than [18] months after the date of initiation of negotiations unless otherwise agreed by the Conference of States

*Article III.1* calls for the States Party to the treaty to accept the safeguards required to verify the main obligations of Article I of the Treaty. There are obligations in Article I, however, that cannot easily be verified by safeguards such as in Article I.3. Article III.3 therefore enumerates those obligations under Article I that should be verified by the IAEA.

*Article III.2* recognizes that States Parties that have a comprehensive or full-scope safeguards agreement based on the NPT Model Agreement INFCIRC/153 (corrected) already are fully covered by safeguards on all their declared fissile materials and declared production facilities. These states include all the Non-Nuclear Weapon States (NNWS) party to the NPT having significant nuclear activities.<sup>14</sup>

Effective verification of a production cut-off, however, also requires measures to ensure that there are no undeclared prohibited activities. The Additional Protocol (AP) was specifically designed for this purpose.<sup>15</sup> Article III.2 therefore requires that all States that have a comprehensive agreement also ratify the Additional Protocol. For the non-nuclear-weapon states that have not yet ratified the Additional Protocol, this would be their only new obligation under the FM(C)T.

For non-weapon states that decide to use fissile materials for military, non-explosive purposes (such as naval propulsion), which is allowed under the NPT and its comprehensive safeguards agreement (see paragraph 14 of INFCIRC/153), special arrangements would have to be made to verify that such material is not used for weapons. This issue is discussed under Article III.3.ii.c.

The definition of fissile materials in this Treaty could be extended to include neptunium-237 and americium-241 and -243 and perhaps other materials that can support a fission chain reaction. These materials are not today subject to IAEA safeguards. The Statute of the IAEA does not include these materials in its definition of Special Fissionable Materials, and INFCIRC/153 is based on the Statute in this respect. The Board of Governors of the IAEA has the power to add materials to the definition in the Statute (see Article XX.1 of the Statute) but has as yet not done so. It is conceivable that, before the entry into force of the FM(C)T, the Board could take such an action. This would not automatically lead to a change in the application of safeguards, however, since individual states would have to accept the change (see paragraph 112 of INFCIRC/153). It should be noted, however, that very few non-nuclear weapon states have significant quantities of neptunium and americium -- probably just some of the few non-weapon states that have

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<sup>14</sup> Although the NPT requires that all NNWS should have a comprehensive Safeguards Agreement, some states with no significant nuclear activities have yet to conclude such an agreement with the IAEA.

<sup>15</sup> After the discovery of Iraq's clandestine nuclear program in 1991, the Additional Protocol (INFCIRC/540) was devised to provide the IAEA more information about nuclear-related activities in non-weapon states and to allow it to verify the correctness and completeness of such information including by the use of environmental sampling at undeclared locations such as swipes of surfaces to detect micron-sized particles of enriched uranium and plutonium. As of 21 January 2009, eighty-five non-nuclear-weapon states plus the five NPT nuclear-weapon states and Euratom had an Additional Protocol in force, [www.iaea.org/OurWork/SV/Safeguards/sg\\_protocol.html](http://www.iaea.org/OurWork/SV/Safeguards/sg_protocol.html).

reprocessed, so possibly only these few would need to adapt their safeguards agreements (see paragraph 23 of INFCIRC/153). Very small amounts (grams or less) of Am-241 are being used in other states for the manufacture of smoke alarms containing less than a microgram each, but the IAEA could allow exemption of such gram quantities of fissile material from safeguards (paragraph 36 of INFCIRC/153).

*Article III.3* describes the verification measures needed in those States Parties that do not fall under Article III.2, i.e., countries that do not have a safeguards agreement covering all their fissile materials but have at least one significant quantity of such material.<sup>16</sup> Sub-article III.3.i provides for the verification of the non-production of fissile materials for nuclear weapons or other nuclear explosive purposes while allowing the production of fissile material under safeguards. A Model Safeguards Agreement for such countries would have to be negotiated in parallel with the negotiation of the Treaty.

Sub-article III.3.ii covers the non-diversion to use in nuclear weapons of different categories of fissile materials submitted to IAEA monitoring.

In the civilian sector, the safeguards needed for these States Parties could be patterned on IAEA safeguards in non-weapon states. In other cases, such as excess weapon materials that are still in classified form or materials for non-explosive military uses, the IAEA, the governments of the states concerned and perhaps the governments of other interested states could develop model agreements.

Nuclear-weapon states party to the NPT have already accepted some international safeguards on their civilian nuclear material and facilities. The United States has offered all its civilian facilities for safeguards under its voluntary safeguards agreement with the IAEA, while France and the United Kingdom have all their peaceful nuclear activities under EURATOM safeguards.<sup>17</sup>

States with a significant quantity of fissile material that do not have a Comprehensive Safeguards Agreement with the IAEA, namely the NPT nuclear-weapon states and the non-parties to the NPT, would also have to accept an Additional Protocol in order to provide the IAEA the means to detect clandestine production activities prohibited by the Treaty. Some NPT nuclear-weapon states have already concluded an Additional Protocol with the IAEA, but because of the limits they place on IAEA inspections, these

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<sup>16</sup> This group consists today of China, India, Israel, France, North Korea, Pakistan, Russia, the United Kingdom, and the United States. However, North Korea committed in September 2005 to returning “at an early date” to the NPT as a non-weapon state and to reactivating its Comprehensive Safeguards agreement, “Joint Statement of the Fourth Round of the Six-Party Talks,” Beijing, 19 September 2005. At the time of this writing (July 2009), however, North Korea was claiming the status of a weapon state.

<sup>17</sup> Under a Voluntary-Offer Agreement, a nuclear-weapon state gives the IAEA the opportunity to inspect specified civilian facilities and nuclear materials. These offers are meant to reduce the differences in the safeguards burdens on nuclear and non-nuclear weapon states but, in practice, the IAEA does not have sufficient funds to safeguard more than a few nuclear facilities in the weapon states. For an overview of these agreements, see *Global Fissile Material Report 2007*, International Panel on Fissile Materials, Princeton, NJ, 2007, pp. 61–81.

agreements fall far short of those in INFCIRC/540. The U.S. Additional Protocol is the closest to the Additional Protocol for non-weapon states but allows the U.S. Government to prevent IAEA access “to activities with direct national security significance to the United States or to locations or information associated with such activities.”<sup>18</sup>

Under an FM(C)T, the relevant states and the IAEA would have to conclude “managed access” arrangements to protect sensitive national or commercial information while allowing IAEA inspectors to satisfy themselves that no clandestine production of fissile material is taking place (see *GFMR08*, chapter 8).

***Sub-article III.3.i*** refers to the obligations under Article I.1 and I.4. The IAEA should verify the disablement, decommissioning, and dismantlement in time of all enrichment and reprocessing facilities used for pre-Treaty production of fissile materials for nuclear-weapons purposes unless they are converted to the production of nuclear materials for civilian and/or non-explosive military purposes and placed under safeguards. The rationale is that an FM(C)T should not allow plants for which there is no foreseeable alternative use to remain in a state ready for production of fissile materials for weapons.

All enrichment and reprocessing plants should be brought under safeguards, and any fissile materials that they produce should remain under safeguards. Since it is unlikely for the foreseeable future that highly enriched uranium will be produced in more than a few states, the safeguards in most enrichment plants could be restricted to verifying that only low-enriched uranium is being produced. The IAEA already has extensive experience in this field but special issues would arise at enrichment plants that have produced HEU in the past (see *GFMR08*, chapter 4).

***Sub-article III.3.ii*** refers primarily to the obligations under Article I.5, but also to those under Articles I.2 and I.6. It mandates that all the fissile materials mentioned in Article I.5 should come under some kind of safeguards regime. Since the status of each category of fissile materials is different and some can be in forms with classified designs, they are discussed separately below:

*a) Civilian materials.* Some weapons states (France, India, Russia, the UK and US) have large stockpiles of separated reactor-grade plutonium that is not subject to IAEA safeguards. The French and UK stocks are under Euratom safeguards. It is usually assumed that this plutonium will be used in reactor fuel. The extension of IAEA safeguards to all civilian fissile material in all FM(C)T parties should not create major problems except increased cost. Safeguarding large already-operating reprocessing plants whose designs are not “safeguards friendly” could be the biggest challenge (see *GFMR08*, chapter 5). During a transition period, the safeguards goals in the States Parties falling under Article III.3 might be somewhat less strict than for those under III.2. Over time, however, the safeguards regimes for the different categories of states should converge, since it will be important to reduce the inequality in safeguards commitments

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<sup>18</sup> Protocol Additional to the Agreement Between the United States of America and the International Atomic Energy Agency for the Application of Safeguards in the United States of America, Article I.c, [www.ipfmlibrary.org/gov98.pdf](http://www.ipfmlibrary.org/gov98.pdf).

on civilian nuclear power in different classes of states and because the ultimate goal is a world in which all states are non-weapon states.

The IPFM recommends placing all spent fuel under IAEA monitoring, as is the case in non-weapons states that are Parties to the Nonproliferation Treaty. Spent fuel typically contains plutonium and sometimes HEU. With time, the radiation field around some of this fuel will decline to the point where it can no longer be considered “self-protecting” by the standards established by the IAEA.<sup>19</sup>

*b) Excess weapon materials.* Russia, the United Kingdom and the United States have already declared large quantities of weapons fissile materials excess for any military purpose. Russia and the United States have agreed to dispose of their excess weapon-grade plutonium irreversibly under international safeguards once the material is in unclassified form.<sup>20</sup> Furthermore, the two governments and the IAEA also undertook a joint multi-year study (the Trilateral Initiative) to develop techniques to permit the IAEA to verify through an “information barrier” whether containers declared to hold plutonium in classified forms contain more than an agreed threshold amount of weapon-grade plutonium. This study identified and developed technical, legal, and financial approaches to accomplish the verification without compromising national security information (see *GFMRO8*, chapter 6). During the 1990s, Russian and American weapons experts also developed, on a bilateral basis, ambitious verification procedures under which Russia and the United States could monitor the dismantlement of each other’s excess warheads without revealing sensitive weapon-design information.<sup>21</sup>

Sub-sub-article III.3.ii.b commits the Parties to develop with the IAEA appropriate monitoring arrangements on excess fissile material. Such arrangements could build on the Trilateral Initiative and the bilateral Russian-U.S. studies. Even if it proves impossible to agree on such arrangements while the fissile material remains in classified form,

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<sup>19</sup> 1 Gray or 100 rads per hour at a distance of one meter, see IAEA-document INFCIRC/225, Rev.4, section 5.2, Footnote b. Below the self-protection level, it might be possible to separate HEU or plutonium out of spent fuel in a facility with less shielding than is required in a reprocessing plant.

<sup>20</sup> “Each Party shall begin consultation with the International Atomic Energy Agency (IAEA) at an early date and undertake all other necessary steps to conclude appropriate agreements with the IAEA to allow it to implement verification measures beginning not later in the disposition process than: (a) when disposition plutonium or disposition plutonium mixed with blend stock is placed into the post-processing storage location of a conversion or conversion/blending facility; or (b) when disposition plutonium is received at a fuel fabrication or an immobilization facility, whichever (a) or (b) occurs first for any given disposition plutonium, *Agreement between the Government of the United States of America and the Government of the Russian Federation Concerning the Management and Disposition of Plutonium Designated as no Longer Required for Defense Purposes and Related Cooperation*, 2000, [www.ipfmlibrary.org/doe00.pdf](http://www.ipfmlibrary.org/doe00.pdf), Article VII.3.

<sup>21</sup> Most of this work is recorded only in “official-use-only” reports. Some of the ideas are reported, however, in Nicholas Zarimpas, ed., *Transparency in Nuclear Warheads and Materials: The Political and Technical Dimensions*, SIPRI, Oxford University Press, 2003; and *Monitoring Nuclear Weapons and Nuclear-explosive Materials: An Assessment of Methods and Capabilities*, National Academy Press, Washington, D.C., 2005.

however, standard IAEA safeguards should be applied as soon as the fissile material is converted into unclassified form.

*c) Fissile material for military non-explosive purposes.* The draft FM(C)T, like the Non-Proliferation Treaty, allows a Party to produce and use fissile material for military non-explosive purposes—notably fueling naval-propulsion or tritium-production reactors. In the model-agreement for NPT non-nuclear weapon states (INFCIRC/153, Article 14) the possibility was created for safeguards on nuclear material to be temporarily suspended while the material is being used for a non-peaceful, non-explosive activity.

The state involved must provide information, however, that gives confidence that the material is not being used for nuclear weapons. It must also provide data on the “total quantity and composition” of the unsafeguarded material and bring it back under safeguards as soon as its permitted military use ends. Thus, a special agreement relating to this material must be negotiated with the IAEA. To date, no NNWS has asked for such an arrangement; nor have the specifics of an arrangement been worked out. Brazil is pursuing a naval-reactor program, however, which may soon require one. Under even the narrowest definition of an FM(C)T that focused only on fissile material produced after the Treaty came into force, such an arrangement would be required for fissile material newly produced to fuel military reactors. The IPFM Draft FM(C)T would subject pre-existing HEU reserved for military reactor fuel to the same requirement.<sup>22</sup> (Some ideas for how to approach this challenge are presented in *GFMRO8*, chapter 7.)<sup>23</sup>

The use of HEU for naval-reactor fuel would be a potential threat to the integrity of the FM(C)T, however. If the sensitivity of the designs of both naval reactors and their fuels forces too great compromises in IAEA monitoring of the naval fuel cycle, it will be difficult to assure that some HEU withdrawn from safeguards for use in naval fuel has not been diverted to weapons. For this reason and because of the usability of HEU for terrorist nuclear weapons, states should make every effort to minimize their use of HEU for military as well as civilian purposes. States with nuclear navies should design their future naval reactors to use low enriched uranium (LEU) fuel. France is believed to have nearly completed a transition of its naval nuclear propulsion reactors to LEU fuel.

**Article III.4** sets a timetable for conclusion of the safeguards agreements similar to that required for non-weapon states by the Non-Proliferation Treaty. The IAEA, advised by national experts, should begin the development of a model safeguards agreement in advance of the completion of an FM(C)T.

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<sup>22</sup> To date, the United States is the only country that has declared a reserve of excess weapon HEU for future use in naval-reactor fuel. In the past, the United States has provided the United Kingdom with HEU for naval-reactor fuel.

<sup>23</sup> Russia, the United Kingdom and the United States all have large stockpiles of pre-existing HEU that could be used to fuel their naval reactors for decades. India probably does not have such a stockpile for its nuclear-submarine program. Whether China uses LEU or HEU for its naval-reactor fuel is not known.

***Article IV: Declarations***

***IV.1.*** Each State Party undertakes to publish annually after the Treaty comes into force and present to the Conference of States Parties national inventories of all fissile materials, in its possession or under its control, by category: in civilian, nuclear-weapon and military non-explosive use.

***IV.2.*** Each State Party undertakes to report progress on measures it has taken nationally, bilaterally, and multilaterally to reduce national inventories of fissile materials available for nuclear weapons and other explosive devices.

***Article IV.1*** would create transparency in the various inventories of fissile materials. Two nuclear-weapon states have already published such inventories once (see *GFMR07*, Chapter 6).<sup>24</sup> These data would provide a good basis for further arms control and disarmament measures.

***Article IV.2*** is a logical follow-up of Article IV.1, requiring reports on the progress made in decreasing the amounts of fissile materials available for weapons use.

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<sup>24</sup> The United States and the United Kingdom, except that the U.K. did not divide its military HEU declarations into weapons and fuel stocks. The U.S. declarations were in, *Plutonium: The First 50 Years: United States Plutonium Production, Acquisition and Utilization from 1944 through 1994*, U.S. Department of Energy, DOE/DP-0137, 1996, [www.ipfmlibrary.org/doe96.pdf](http://www.ipfmlibrary.org/doe96.pdf); and *Highly Enriched Uranium: Striking a Balance: A Historical Report of the United States Highly Enriched Uranium Production, Acquisition, and Utilization Activities, 1945 through September 30, 1996*, U.S. Department of Energy, 2001 (revision 1, redacted for public release), [www.ipfmlibrary.org/doe01.pdf](http://www.ipfmlibrary.org/doe01.pdf). They contain much more information than would be required by Article IV.1. The U.K. declarations of its military stocks of fissile material were in its *Strategic Defence Review*, Ministry of Defence, 1998, subsequently supplemented in *The United Kingdom's Defence Nuclear Weapons Programme: A Summary Report by The Ministry of Defence on the Role of Historical Accounting for Fissile Material in the Nuclear Disarmament Process, and on Plutonium for the United Kingdom's Defence Nuclear Programme*, [http://www.mod.uk/NR/rdonlyres/C4840896-90AD-4A8C-BF8D-C2625C7C1DD8/0/historical\\_accounting.pdf](http://www.mod.uk/NR/rdonlyres/C4840896-90AD-4A8C-BF8D-C2625C7C1DD8/0/historical_accounting.pdf), Ministry of Defence, 2000 and *Historical Accounting for U.K. Defense Highly Enriched Uranium*, Ministry of Defence, 2006, [www.ipfmlibrary.org/mod06.pdf](http://www.ipfmlibrary.org/mod06.pdf). The U.K. publically declares its civilian stocks of HEU and separated plutonium annually to the IAEA in its INFCIRC/549/Add.8.

## ***Article V: The Organization***

### ***A. General provisions***

***V.1.*** *The States Parties hereby establish the Fissile Material [Cutoff] Treaty Organization (hereinafter referred to as ‘the Organization’) to achieve the objectives of this Treaty, to ensure the implementation of its provisions in close cooperation with the IAEA, and to provide a forum for consultation and cooperation among States Parties. All States Parties shall be members of the Organization. The seat shall be Vienna, Republic of Austria.*

***V.2.*** *There are hereby established as organs of the Organization: the Conference of the States Parties and the Secretariat.*

***V.3.*** *Delegates of States Parties, together with their alternates and advisers, the Executive Secretary and the members of the staff of the Secretariat shall enjoy such privileges and immunities as are necessary in the independent exercise of their functions in connection with the Organization. Their legal capacities, privileges and immunities shall be defined in an agreement between the Organization and the State in which the Organization is seated.*

### ***B. The Conference of States Parties***

***V.4.*** *The Conference of States Parties (hereinafter referred to as “the Conference”) shall be composed of all States Parties.*

***V.5.*** *The initial session of the Conference shall be convened by the Depositary no later than 30 days after entry into force of the Treaty. By a majority of [three-fourths] of States Parties present and voting, this Conference shall establish its own Rules of Procedure. The Conference shall meet in regular sessions that shall be held [annually] [just before or after the General Conference of the IAEA], unless the Conference decides otherwise*

***V.6.*** *A Special Session of the Conference shall be convened:*

*(a) When decided by the Conference;*

*(b) When requested by any State Party and supported by [one-fourth] of the States Parties.*

***V.7.*** *The Conference may also be convened in the form of an Amendment Conference, in accordance with Article X, or as a Review Conference, in accordance with Article XII.*

***V.8.*** *The Conference shall oversee the implementation of, and review compliance with this Treaty, and act in order to promote its object and purpose. To this end, the Conference may provide for a Bureau and other subsidiary bodies of the Conference as required to carry out its responsibilities.*

*V.9. The Conference shall conclude agreements with the IAEA to undertake the verification responsibilities of this Treaty and may conclude other agreements as appropriate with other international organizations.*

*V.10. The Conference shall receive reports from States Parties, the Executive Secretary, and the IAEA Director General on the implementation of this Treaty. It shall oversee the activities of the Secretariat and may issue guidelines for the exercise of its functions.*

### *C. The Secretariat*

*V.11. The Secretariat shall assist States Parties in the implementation of this Treaty and shall assist the Conference and its subsidiary organs in the performance of their functions.*

*V.12. The Secretariat shall comprise an Executive Secretary and such other personnel as may be required. The Executive Secretary shall be appointed by the Conference for a term of [four] years, renewable for one further term. Only citizens of States Parties shall serve as Executive Secretary or as members of the staff. The staff shall be kept to the minimum necessary for the proper discharge of the responsibilities of the Secretariat.*

*V.13. The Executive Secretary and members of the staff shall not seek or receive instructions from any Government or from any other source external to the Organization. Each State Party shall respect the exclusively international character of the responsibilities of the Executive Secretary and the members of the staff.*

**Article V.** The FM(C)T would need its own – modest - organization. The IAEA would take on the verification responsibilities of the Treaty. The Board of Governors of the IAEA may not be able to handle all FM(C)T issues, however, because the Treaty covers more than safeguards (such as some compliance matters and commitments in the disarmament field.). Experience has shown that some issues related to the Non-Proliferation Treaty (NPT), which has no permanent organization, are handled with difficulty or not at all by the NPT Review Conferences, which are held only every five years. The Chemical Weapons Convention (CWC) has – and the Comprehensive Nuclear-Test-Ban Treaty (CTBT), after its entry into force, will have a permanent implementation body, a yearly Conference of States Parties, an Executive Council and a permanent Secretariat.

Also, in the early years of the NPT, there were conflicts between the NPT Parties and members of the IAEA Board of Governors (BoG) that were not yet NPT parties, inter alia over the financing of NPT safeguards. Until all members of the BoG are Parties to the FM(C)T, similar difficulties could arise.

Finally, the IAEA BoG is bound by the Statute of the IAEA, which was designed without consideration of the possibility of non-compliance by the veto-wielding members of the UN Security Council (see also the discussion of Article VI).

It is not proposed, however, to create a major bureaucracy parallel to the IAEA but merely a forum for FM(C)T Parties to discuss matters that cannot be handled by the IAEA and its BoG.

Like in other Treaties, this article has a general part as well as specific sections on the different organs of the Organization. Most of the text forms an abbreviated version of similar texts in other treaties.

### *General Provisions*

**Article V.1** allows for the formal establishment of the FM(C)T Organization.

**Article V.2** establishes a Conference of States Parties and a Secretariat as organs of the Organization. No need is seen at the moment for an Executive Council, but the Conference could decide otherwise later

**Article V.3** refers to the need of privileges and immunities for delegates and staff if they are to be able to do their work properly.

### *The Conference of States Parties*

**Article V.4.** As with other treaties, the Conference consists of all Parties to the Treaty.

**Article V.5.** It is left to the Conference to establish its own Rules of Procedure. To avoid vetoes, however, decisions on the Rules of Procedure should be made by a super-majority and not by consensus.

Because of the strong links of the FM(C)T with the IAEA, it may be easiest to organize meetings of the Conference just before or after the annual General Conference of the IAEA (normally in Vienna).

**Article V.6.** This paragraph provides the opportunity to convene special sessions of the Conference if and when the need arises.

**Article V.7.** The Conference can also be convened when there has been a proposal for an amendment to the Treaty, or in the form of a Review Conference. If the Conference meets regularly, there may not be a need for Review Conferences. It is noted, however, that review conferences are provided for in both the CWC and the CTBT despite the regular meetings of Conferences of States Parties. See also Article XII.2.

**Article V.8.** The main functions of the Conference are described here as well as in Articles V.9 and V.10 and Article VI. If need be, a bureau and/or other special committees could be established by the Conference, with staff support provided by the Secretariat. If a bureau is required, its members could include the representatives in Vienna of the members of the IAEA Board of Governors that are Parties to the FM(C)T as well as representatives of some other Parties.

**Article V.9.** A formal agreement on the tasks of the IAEA with regard to the FM(C)T would be necessary. Whether there is a need to make agreements with other organizations remains to be seen, but that possibility should not be excluded.

**Article V.10.** The Conference will need to receive and evaluate reports on the implementation of the Treaty and has to give guidance to the Secretariat.

#### *The Secretariat*

**Article V.11** describes the main functions of the Secretariat.

**Article V.12** states that the Secretariat will consist of an Executive Secretary and a staff that will probably be rather small. It is left to the Conference to decide on the size of the staff and to describe all the tasks of the Executive Secretary and his/her staff. A flexible approach is recommended since the tasks and work load may change considerably in time.

**Article V.13** emphasizes that the Executive Secretary and its staff members are international servants of *all* Parties to the Treaty and that the Parties should fully respect those responsibilities.

***Article VI: Measures to Redress a Situation and to Ensure Compliance***

***VI.1.*** Each State Party shall inform promptly the Secretariat about any situation that it considers ambiguous or gives rise to a concern about the possible non-compliance of another State Party with this Treaty.

***VI.2.*** The Secretariat shall promptly inform the Conference about any information it receives from a State Party, the DG of the IAEA, or other sources about any situation that it considers ambiguous or that gives rise to a concern about the possible non-compliance of a State Party with this Treaty.

***VI.3.*** The Conference shall take the necessary measures, as set forth in paragraphs 2 and 3, to ensure compliance with this Treaty and to redress and remedy any situation that contravenes the provisions of this Treaty. The Conference shall consider any concern raised by a State Party or the Director General of the IAEA about possible non-compliance with this Treaty. The Conference shall take appropriate steps to ensure consultation, clarification and investigation of such a concern, and may request the IAEA to conduct appropriate inspections as soon as possible.

***VI.4.*** In cases where a State Party has been requested by the Conference to redress a situation raising problems with regard to its compliance and fails to fulfil the request within the specified time, the Conference may, inter alia, decide to restrict or suspend the State Party from the exercise of its rights and privileges under this Treaty until the Conference decides otherwise.

***VI.3.*** In cases where damage to the object and purpose of this Treaty may result from non-compliance with the obligations of this Treaty, the Conference may recommend to States Parties collective measures that are in conformity with international law.

***VI.4.*** The Conference may bring the issue, including relevant information and conclusions, to the attention of both the General Assembly and Security Council of the United Nations.

***Article VI.*** The Conference would have to consider any questions related to non-compliance with the Treaty. The Statute of the IAEA demands that any violation of a safeguards agreement shall be reported to the UN Security Council, which can then decide to take further action in accordance with the Charter of the United Nations, such as obligatory sanctions (or even military intervention) under Chapter VII of the Charter. However, neither the IAEA Statute nor the NPT-safeguards regime include obligatory safeguards for the five NPT nuclear weapon states, which are also permanent members of the Security Council with veto powers.

Under an FM(C)T, possible violators of the Treaty may have veto power in the UN Security Council. It is therefore necessary that all FM(C)T Parties have an equal opportunity to discuss any suspected violation and that the UN as a whole, including the

General Assembly, be able to receive a referral by the Conference of States Party to the FM(C)T.

This Article is based on similar provisions in the Chemical Weapons Convention (CWC) and in the Comprehensive Test Ban Treaty (CTBT), where similar problems could arise.

*Article VI.1* requires Parties to inform as soon as possible the Secretariat about any evidence or concerns they may have concerning possible violations of the Treaty by other Parties. It aims to ensure Parties can raise concerns about compliance and expect redress through the mechanism of the Treaty rather than bilaterally or by taking unilateral action.

*Article VI.2* puts the onus on the Secretariat to assess reports it receives about possible non-compliance, which under this article can be from Parties, the Director-General of the IAEA or from any other source (such as for instance civil-society groups or a whistleblower), and to determine if such reports are sufficient basis for a finding that a situation raises concerns about possible non-compliance that require clarification from a Party. Any such finding is to be reported to the Conference of Parties.

*Article VI.3* describes the primary procedures to obtain clarifications on possible non-compliance concerns. In this connection, there would have to be an agreement that the Director General of the IAEA would report any possible non-compliance with FM(C)T safeguards to the Executive Secretary of the Conference as well as to the IAEA Board of Governors.

*Article VI.4* and the remaining paragraphs of Article VI are largely derived from the CWC and CTBT. The “rights and privileges” that could be suspended would the rights to participate and vote in Conference deliberations.

*Article VI.5* provides for the possibility of collective measures by the Parties against a violator of the Treaty. Although the Conference would not have the rights of the UN Security Council under Chapter VII of the Charter, Parties could agree on voluntary sanctions or other measures.

*Article VI.6* provides that, if and when it is not possible to deal with an issue of non-compliance through the procedures and actions of the Conference, the issue may be reported to the General Assembly and/or the Security Council of the United Nations.

***Article VII: National Implementation Measures***

***VII.1.*** Each State Party shall, in accordance with its constitutional processes, take any necessary measures to implement its obligations under this Treaty. In particular, it shall:

*i.* Prohibit natural and legal persons anywhere on its territory or in any other place under its jurisdiction or control from undertaking any activity prohibited to a State Party under this Treaty;

*ii.* Not permit on its territory or in any other place under its jurisdiction or control any activity prohibited by this Treaty;

*iii.* Enact proper penal legislation with respect to all activities prohibited by this Treaty;

*iv.* Extend such legislation, in conformity with international law, to any activity prohibited by this Treaty undertaken anywhere by natural persons possessing its nationality and to vessels flying its flag; and

*v.* Undertake to maintain the highest standards of security and effective physical protection of all fissile materials and relevant facilities and equipment to prevent theft or unauthorized use and handling. To that end each Part, *inter alia*, undertakes to apply measures of physical protection at least equivalent to those provided for in the Convention on Physical Protection of Nuclear Material and in recommendations and guidelines developed by IAEA for that purpose.

***VII.2.*** Each State Party shall distribute the text of this Treaty in its official national language(s).

***Article VII.1.i-iv*** has been taken to a large extent from other multilateral treaties such as the CTBT. It is essential that natural and legal persons of a State Party, wherever they are, be prohibited by national legislation from engaging in activities that are contrary to the goals of and obligations under the Treaty. Also, State Parties should prohibit activities contrary to the Treaty on their territories, vessels etc., including by non-nationals.

***Article VII.1.v*** establishes an obligation for all States Parties to use at least minimum agreed standards of physical security of fissile materials because of the danger if such materials fell into the hands of terrorists or other sub-national groups. Parties should at least implement the levels of physical protection identified in the IAEA Convention on Physical Protection of Nuclear Materials<sup>25</sup> as well as the physical protection measures identified in IAEA guidelines in this field.<sup>26</sup> Countries also would be responsible to

<sup>25</sup> IAEA-document INFCIRC/274/Rev.1

<sup>26</sup> IAEA-document INFCIRC/225/Rev.4 (corrected)

assure that any fissile material transferred to another country would be subject to the strongest possible physical security.

**Article VII.2** obliges each State Party to distribute the text of the FM(C)T in its national language(s) to ensure that its citizens in general – and those involved in nuclear activities in particular -- are aware of the obligations that the State has accepted.

### ***Article VIII: Settlement of Disputes***

**VIII.1.** *Disputes that may arise concerning the application or the interpretation of this Treaty which cannot be settled under the Statute of the IAEA, shall be settled in accordance with the relevant provisions of this Treaty and in conformity with the provisions of the Charter of the United Nations.*

**VIII.2.** *When such a dispute arises between two or more States Parties, the parties concerned shall consult together with a view to the expeditious settlement of the dispute by negotiating or by other peaceful means of the parties' choice, including using the good offices of the Conference and, by mutual consent, referral to the International Court of Justice in conformity with the Statute of the Court.*

**VIII.3.** *The Conference shall consider questions related to disputes raised by States Parties or brought to its attention by the Executive Secretary or by the Director General of the IAEA. The Conference shall, as it finds necessary, establish or entrust subsidiary bodies with tasks related to the settlement of these disputes in conformity with Article V.5.*

**VIII.4.** *The Conference is empowered, subject to authorization from the General Assembly of the United Nations, to request the International Court of Justice to give an advisory opinion on any legal question arising within the scope of the activities related to this Treaty.*

**VIII.5.** *This Article is without prejudice to Article VI.*

**Article VIII** is inspired by similar provisions in other relevant treaties and conventions, such as the CWC and CTBT.

***Article IX. Protocols***

***IX.1.*** *In order to progressively bring all nuclear materials in all States under effective non-discriminatory safeguards by the IAEA, and to advance other purposes of this Treaty, the Conference may, at any regular session, adopt protocols to the Treaty.*

***IX.2.*** *The text of any proposed protocol shall be communicated to the States Parties by the Executive Secretary at least 180 days before such a session.*

***IX.3.*** *The requirements for entry into force of any protocol shall be established by that instrument.*

***IX.4.*** *Decisions under any protocol shall be taken by the states parties to that protocol.*

***Article IX.1*** makes it possible for the Conference to adopt Protocols. This may facilitate the development of further specifics concerning the implementation of the Treaty or allow additional commitments to be made by sub-groups of countries without having to amend the Treaty itself. Depending upon the circumstances, the Protocols may therefore apply to all States Parties or to only a relevant group of parties.

***Article IX.3*** gives flexibility to the negotiators of a specific protocol to decide the conditions under which it will enter into force.

***Article IX.4*** indicates that a protocol is the “property” of its parties.

***Article X. Amendments***

***X.1.*** *At any time after the entry into force of this Treaty, any State Party may propose amendments to the Treaty. Any such proposal shall be communicated to the Executive Secretary, who shall circulate it to all States Parties and the Depositary and seek the views of the States Parties on whether an Amendment Conference should be convened to consider the proposal. If [one-third] of the States Parties notify the Executive Secretary no later than [90] days after its circulation that they support further consideration of the proposal, the Executive Secretary shall convene an Amendment Conference to which all States Parties shall be invited.*

***X.2.*** *The Amendment Conference shall be held immediately following a regular session of the Conference unless all States Parties that support the convening of an Amendment Conference request otherwise. In no case shall an Amendment Conference be held less than [180] days after the circulation of the proposed amendment.*

***X.3.*** *Amendments shall be adopted by the Amendment Conference by a positive vote of a majority of the States Parties with no State Party casting a negative vote.*

***X.4.*** *Amendments shall enter into force for all States Parties 30 days after deposit of the instruments of ratification or acceptance by [two-thirds] of those States Parties casting a positive vote at the Amendment Conference.*

***Article X*** is a more or less standard text on possible amendments to a Treaty. However, protocols would be a much more feasible route to evolving the Treaty.

***Article XI. Funding***

*[The additional safeguards costs needed for the implementation of this Treaty shall be met from the [regular] [safeguards] budget of the IAEA. The cost of the Conferences shall be met by the States Parties in accordance with the United Nations scale of assessments adjusted to take into account differences in membership between the United Nations and the Conference.]*

or

*[The costs of the implementation of this Treaty shall be met by the States Parties in accordance with the United Nations scale of assessments adjusted to take into account differences in membership between the United Nations and the Conference.]*

or

*[The costs of the Conference shall be met by the States Parties in accordance with the United Nations scale of assessments adjusted to take into account differences in membership between the United Nations and the Conference. The additional safeguards costs needed for the implementation of this Treaty in the States Parties with at least one significant quantity of fissile material not under IAEA safeguards shall be met by these States Parties using a scale of assessments to be developed [taking into account the United Nations scale of assessments and the capacity of their enrichment and reprocessing plants operating under safeguards.]*

**Article XI** describes different options for funding the Conference and, more significantly, the additional safeguards needed for this Treaty. The extra safeguards costs would be considerable – perhaps equal to those of the safeguards currently implemented by the IAEA in Non-Nuclear Weapon States.<sup>27</sup> In addition there would R&D costs associated with keeping safeguards up to date, strengthening them, and taking advantage of new technological opportunities. Each of the listed options has its advantages and disadvantages.

Under the first option, all IAEA member States would have to pay for the extra safeguards effort. Not all members of the IAEA would initially be parties to the FM(C)T, however. Also, safeguards and technical assistance in the application of peaceful nuclear technologies accounted for three quarters of the IAEA budget in 2007, with information and administrative overheads constituting almost all of the remainder.<sup>28</sup> Since an

<sup>27</sup> It should be noted that the Nuclear Weapon States have voluntarily offered to accept safeguards in most or some of their civilian nuclear facilities. Currently, however, due to its lack of financial and human resources, the IAEA is inspecting only a few of these facilities.

<sup>28</sup> IAEA Annual Report, 2007, Table A1.

understanding has developed within the IAEA Board of Governors that expenditures for safeguards and for technical assistance will be kept approximately equal, doubling the IAEA safeguards budget might require doubling the entire IAEA budget.

Under the second option, all States Parties to the FM(C)T would pay the additional safeguards costs. This would seem fair since disarmament is a common interest and the safeguards in Non-Nuclear Weapon States have been financed also by the Nuclear Weapon States on that basis.

Under the third option, the nuclear-weapon states would pay for the extra safeguards costs. How the costs would then be shared among them would be a matter for further negotiation. One formula might be based on the scale of the FM(C)T-related activities on the territories of the nuclear-weapon states, for example, the production capacities of their enrichment and reprocessing plants.

### ***Article XII. Duration, Review and Withdrawal***

***XII.1. This Treaty shall be of unlimited duration.***

***XII.2. Unless otherwise decided by a majority of the States Parties, five years after the entry into force of this Treaty, a Conference of the States Parties shall be held to review the operation and effectiveness of this Treaty, with a view to assuring itself that the objectives and purposes in the Preamble and the provisions of the Treaty are being realized. In this context, it shall review how to promote the universality and effectiveness of the Treaty***

***XII.3. At intervals of [five] years thereafter, further Conferences may be convened with the same objective, if the Conference so decides in its preceding session.***

***XII.4. Each State Party shall have the right to withdraw from this Treaty if it decides that extraordinary events related to the subject matter of this Treaty have jeopardized its supreme interests.***

***XII.5. Withdrawal shall be effected by giving twelve months' notice to all other States Parties, the Conference, and the Board of Governors of the IAEA, the Depositary and the United Nations. Notice of withdrawal shall include a statement of and explain the extraordinary event or events that the State Party regards as jeopardizing its supreme interests.***

*On receiving a notice of withdrawal, the Executive Secretary shall, within three months, convene a special session of the Conference in order to consider an appropriate response to the notice.*

**Article XII.1.** Since this Treaty is meant to halt the production of fissile materials for weapons forever, it would make no sense to put a time limit on it. This paragraph is the same as the corresponding paragraphs in the CWC and CTBT.

**Article XII.2** provides for a Review Conference five years after entry into force of the Treaty. Since, according to Article XIII, the Treaty could come into force with relevant countries not yet Parties, the Review Conference would have to look particularly at how such non-adherence, if continued indefinitely, could undermine the FM(C)T.

**Article XII.4** requires, as in other arms control and disarmament agreements, that withdrawal from the Treaty can only occur under very serious circumstances.

**Article XII.5.** Contrary to other treaties in this field, which have three-month (six months in the CTBT) withdrawal notice, in this draft Treaty the withdrawal only takes effect 12 months after notification. Moreover, a special meeting of the Conference is required to be convened within three months to consider the withdrawal notice and what can be done about it.

### ***Article XIII. Signature, Ratification, Accession and Entry into Force***

**XIII.1.** *This Treaty shall be open to all States for signature before its entry into force.*

**XIII.2.** *This Treaty shall be subject to ratification by States Signatories according to their respective constitutional processes.*

**XIII.3.** *Any State that does not sign this Treaty before its entry into force may accede to it in any time thereafter.*

**XIII.4.** *This Treaty shall enter into force after its ratification and the deposit of their instruments of ratification by [forty] States including at least [four] states with at least one significant quantity of unsafeguarded fissile material as determined by the IAEA Director General.*

**Article XIII.1, 2 and 3** contains standard language used in other Treaties and Conventions.

**Article XIII.4.** A significant number of States would have to ratify, including at least a minimum number that are nuclear-weapon states. The rigid entry into force provision in the CTBT, where 44 specific countries have to ratify has kept that Treaty in limbo since 1996. It would be important for the FM(C)T that it starts operating quickly for at least those States that have already unilaterally halted production of fissile materials for weapons. This would provide the opportunity to develop the additional safeguards provisions and techniques needed for this Treaty. During Review Conferences (see

Article XII.2) an assessment could be made whether non-universality is harmful to the stability of the Treaty in the long run.

***Article XIV. Reservations***

*The Articles of this Treaty shall not be subject to reservations.*

***Article XIV.*** Reservations could undermine the Treaty if they reduced the obligations of one or more States Parties.

***Article XV. Depositary***

*The Secretary-General of the United Nations shall be the Depositary of this Treaty.*

***Article XV*** is now a standard provision in multilateral treaties and conventions. The Secretary General would *inter alia* be responsible for maintaining a list of Parties and informing States Parties about new ratifications.

***Article XVI. Authentic Texts***

*The Treaty, of which the Arabic, Chinese, English, French, Russian and Spanish texts are equally authentic, shall be deposited with the Secretary-General of the United Nations.*

***Article XVI*** is also a standard provision for multilateral treaties. The listed languages are the official languages of the United Nations.

**About the IPFM**

The International Panel on Fissile Materials (IPFM) was founded in January 2006. It is an independent group of arms-control and nonproliferation experts from both nuclear weapon and non-nuclear weapon states.

The mission of IPFM is to analyze the technical basis for practical and achievable policy initiatives to secure, consolidate, and reduce stockpiles of highly enriched uranium and plutonium. These fissile materials are the key ingredients in nuclear weapons, and their control is critical to nuclear weapons disarmament, to halting the proliferation of nuclear weapons, and to ensuring that terrorists do not acquire nuclear weapons. IPFM research and reports are shared with international organizations, national governments and nongovernmental groups.

The Panel is co-chaired by Professor R. Rajaraman of Jawaharlal Nehru University, New Delhi, India and Professor Frank von Hippel of Princeton University. Its members include nuclear experts from seventeen countries: Brazil, China, France, Germany, India, Ireland, Japan, Mexico, the Netherlands, Norway, Pakistan, Russia, South Africa, South Korea, Sweden, the United Kingdom and the United States.

Princeton University's Program on Science and Global Security provides administrative and research support for IPFM.

For further information about the International Panel on Fissile Materials, see its website at [www.fissilematerials.org](http://www.fissilematerials.org). Contact IPFM via the Program on Science and Global Security, Princeton University, 221 Nassau Street, 2nd floor, Princeton, NJ 08542, or by email at [ipfm@fissilematerials.org](mailto:ipfm@fissilematerials.org).