

Fissile Material Negotiations in the Conference on Disarmament

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About this version

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Note

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Foreword to Version 1 (November 2009)

This is the first in a series of briefing papers on critical issues on an eventual Fissile Material Treaty. These papers have been compiled with several purposes in mind. They are intended to provide an overview of the range of issues that the Conference of Disarmament will confront in the negotiation of a ban on the production of fissile materials for use in nuclear weapons or other explosive devices. The target audience is negotiators, their advisers and the international public at large.

The material does not pretend to provide an exhaustive analysis of the issues at stake, nor does it attempt to anticipate every negotiating scenario or “bottom line”. Greater depth on many of the issues can be found in the publications and websites listed in the bibliography contained in Annex B of this paper. The bibliography attempts as far as possible to place the subject in the context of the Conference of Disarmament, the forum currently regarded by the international community as the most appropriate in which to negotiate a ban on the production of fissile materials.

The Conference on Disarmament has been grappling with the issue of fissile materials for many years. Accordingly, UNIDIR has included in the bibliography several articles and publications that shed light on this long history or which provide insights into the negotiating dynamics more than a decade ago before work on a treaty foundered. We could have simply drawn the reader’s attention to previous bibliographies, but this might have done a disservice to those who are coming new to the topic after the prolonged hiatus in the Conference.

On the issue of fissile materials, the successful negotiation of a treaty to ban their production will serve several purposes. Banning the production of fissile materials for nuclear weapons will reduce the pool of materials available for manufacturing such weapons, thereby benefiting the causes of horizontal and vertical non-proliferation, and lowering the risk of diversion to terrorists.

A production ban will also aid the cause of nuclear disarmament by making reductions in nuclear arsenals irreversible. This effect will be achieved through the manner in which the treaty ensures that fissile material declared excess to weapons needs is prevented from any future use in nuclear weapons. It will improve the climate of trust among the nuclear powers that their weapons-reductions are indeed irreversible, and at the same time build confidence among non-nuclear-weapon states that real steps toward nuclear disarmament are being taken.

The Institute has been pleased to be involved with the organization of numerous events and activities in support of the CD’s work on this issue, and this briefing paper on fissile material is no exception.

Theresa Hitchens
Director
UNIDIR

1. Background

1.1 A mandate to negotiate in the Conference on Disarmament a ban on the production of fissile material

1. Fissile materials are those elements that “can sustain an explosive fission chain reaction” and “are essential in all nuclear explosives”, the most common being highly enriched uranium (HEU) and plutonium.¹ Since the early days of the Cold War, banning the production of fissile materials for nuclear devices has been a primary goal for advocates of nuclear disarmament. As early as 1953 US President Dwight Eisenhower called for their elimination in his “Atoms for Peace” speech before the United Nations.
2. The end of the Cold War brought a renewed call for nuclear disarmament and for a ban on the production of fissile materials used in nuclear weapons. In a statement to the United Nations General Assembly in September 1993, US President Bill Clinton addressed the issue. Saying that these materials were “raising the danger of nuclear terrorism in all nations”, President Clinton called for the negotiation of an international agreement to halt their production.
3. In December 1993, shortly after that statement, the General Assembly passed Resolution 48/75L entitled “Prohibition of the Production of Fissile Material for Nuclear Weapons or Other Nuclear Explosive Devices”. This resolution recommends an appropriate international body to negotiate a “non-discriminatory multilateral and internationally and effectively verifiable treaty banning the production of fissile material for nuclear weapons or other nuclear explosive devices”. In 1994, the Conference on Disarmament (CD) began discussing the basis on which to initiate those negotiations.

1.2 The Shannon Mandate

4. The CD appointed Ambassador Gerald Shannon of Canada as Special Coordinator to determine the views of CD members on the prospective scope of a treaty banning the production of fissile material for use in nuclear weapons. Such a treaty is sometimes referred to as a Fissile Material Cut-off Treaty (FMCT), Fissile Material Treaty (FMT) and Fissban. It needs to be noted, however, that use of the word “cut-off” (i.e. preventing future production) raises the question as to how or whether the treaty would also cover existing stocks of fissile material. Indeed, the primary debate that surfaced during the Shannon discussions centred on the inclusion of rules that would cover both existing stockpiles and future production of fissile material.
5. Nuclear-weapon-possessing states were not united in their approaches to a ban on fissile material. The P5 and India took the view that existing stockpiles would fall outside the purview of the ban. By contrast, many delegations felt that an effective treaty had to be broad in scope, verifiably banning future production, while at the same time mandating the declaration of existing stockpiles of fissile materials held by states. These delegations, including Pakistan, asserted that the treaty regime would be a meaningful disarmament measure only if it applied to both current stockpiles and future production. Given Israel’s ambiguous nuclear weapon status, Egypt and other Arab states insisted that all stocks of

1 *Global Fissile Material Report 2009*, International Panel of Fissile Materials, 2009, p. 124.

weapon-usable fissile materials would have to be declared and be subject to inspection and inventory under international supervision and control.

6. On 24 March 1995, Shannon produced CD Document 1299 (CD/1299), commonly known as the Shannon Mandate. It called for the establishment of an Ad Hoc Committee² within the CD to negotiate a fissile material treaty. The mandate set two primary objectives:
 - the establishment of an Ad Hoc Committee on a “ban on the production of fissile material for nuclear weapons or other nuclear explosive devices”; and
 - the negotiation of a treaty that in the words of resolution 48/75L would be “non-discriminatory, multilateral and internationally and effectively verifiable”.³

The latter goal was intended to ensure that the outcome was one that applied the same rules to all states, both nuclear-weapon states and non-nuclear-weapon states (in contrast, for example, to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT)).

7. The Mandate did not explicitly describe the scope of the negotiations in relation to stocks of fissile materials (i.e. whether an agreement would apply only to future production or would include past production as well). Shannon noted that in the course of his consultations, “many delegations expressed concerns about a variety of issues relating to fissile material, including the appropriate scope of the [eventual fissile material treaty]”. The mandate left the issue of scope to be discussed, stating: “It has been agreed by delegations that the mandate for the establishment of the Ad Hoc Committee does not preclude any delegation from raising for consideration in the Ad Hoc Committee any of the [these] issues”.⁴
8. After the Shannon Mandate was issued in 1995, discussions on forming the Ad Hoc Committee stalled. States of the Non-Aligned Group, composed primarily of non-nuclear-weapon states, insisted that progress toward the negotiation of a treaty be linked to real progress toward the elimination of nuclear weapons. Dissatisfied with the pace of nuclear disarmament under the NPT, these states called for a specific timetable for nuclear disarmament. However, the five NPT-recognized nuclear-weapon states refused to agree to this linkage.⁵
9. In 1998, after India’s and Pakistan’s nuclear tests, a breakthrough was achieved. On 11 August 1998, toward the end of its session for that year, the CD formally established in CD/1547 an Ad Hoc Committee to negotiate a treaty in accordance with the Shannon Mandate. The Committee met in negotiations for the three remaining weeks of the session, under the chairmanship of Canadian Ambassador Mark Moher. (It should be noted, given the linkages that were subsequently made in the development of the CD’s

2 Rule 23 of the CD’s Rules of Procedure reads: “Whenever the Conference deems it advisable for the effective performance of its functions, including when it appears that there is a basis to negotiate a draft treaty or other draft texts, the Conference may establish subsidiary bodies, such as ad hoc sub committees, working groups, technical groups or groups of governmental experts, open to all member States of the Conference unless the Conference decides otherwise. The Conference shall define the mandate for each of such subsidiary bodies and provide appropriate support for their work”.

3 Conference on Disarmament, *Report of Ambassador Gerald E. Shannon of Canada on Consultations on the Most Appropriate Arrangement to Negotiate a Treaty Banning the Production of Fissile Material for Nuclear Weapons or Other Nuclear Explosive Devices*, document CD/1299, 24 March 1995.

4 Ibid.

5 Frank Barnaby, “The FMCT Handbook: A Guide to a Fissile Material Cut-off Treaty”, Oxford Research Group, 2003, p. 13.

annual work programme, that one other Ad Hoc Committee was established in 1998, with the mandate to negotiate “effective international arrangements to assure non-nuclear-weapon states against the use or threat of use of nuclear weapons”, known also as negative security assurances. That committee began work on 19 May, holding nine meetings in all.)

1.3 Disagreement over the CD’s annual programme of work

10. The breakthrough was short-lived. The Ad Hoc Committee did not reconvene during the 1999 session because consensus could not be reached on the CD’s annual programme of work, a formality required by the Rules of Procedure.⁶ Moreover, the CD would not reach consensus on any programme of work for the next 10 years, stalling negotiations on a fissile material treaty and other substantive matters on the CD’s agenda for that entire period. As well as the general issue of nuclear disarmament, the other main issues on the agenda included the prevention of an arms race in outer space (PAROS) and negative security assurances (NSAs). This quartet is sometimes referred to in the CD as the “core issues”.
11. Several factors led to this inability to reach consensus. Differences over whether a fissile material treaty should cover existing stockpiles, and the linking of the successful conclusion of a treaty to a time-bound schedule for nuclear disarmament, complicated the task of establishing the CD’s annual work programme. Over time, additional linkages arose. US policy in favour of a national missile defence programme served to increase the urgency felt among some members of the CD for pursuing negotiations on the issue of PAROS.⁷ China, the primary advocate of making progress on fissile materials contingent on progress on PAROS, soon gained the backing of Russia, but the United States resolutely opposed the need to negotiate a treaty on PAROS. With these divergences over various linkages among the issues to be covered by a programme of work, negotiations on a fissile material treaty remained stalled.⁸

1.4 Dealing with linkages among items on the programme of work

12. In 2000, CD President Ambassador Celso Amorim of Brazil impressed on the Conference the need to establish a programme of work that “organized differences” in a manner that did not impede progress on other important goals. Amorim proposed a programme of work in CD/1624 that called for the establishment of four separate Ad Hoc Committees within the CD, each with a separate mandate to take up the “important goals of disarmament”.
13. One such committee would be established to negotiate a fissile material treaty. This group would be mandated to negotiate, on the basis of the Shannon Mandate, an agreement to ban the production of fissile materials for nuclear weapons or other nuclear explosive devices.⁹ Another committee would be established to “exchange information and views” to move toward the goal of nuclear disarmament, another to “examine and identify

6 Rule 28 requires the CD to establish its programme of work annually, on the basis of its agenda which is also agreed annually.

7 Jenni Rissanen, “Time for a Fissban—or Farewell?”, *Disarmament Diplomacy*, no. 83, 2006.

8 “Banning the Production of Fissile Materials for Nuclear Weapons: Country Perspectives on the Challenges to a Fissile Material (Cutoff) Treaty”, International Panel on Fissile Materials, 2008, p. 9.

9 Conference on Disarmament, *Proposal by the President on the Programme of Work for the 2000 Session of the Conference on Disarmament*, document CD/1624, 24 August 2000.

specific topics or proposals” pertaining to PAROS, and another to “negotiate with a view to reaching agreement” on NSAs.¹⁰ In an accompanying “Presidential Declaration”, Amorim would make it clear upon adoption of the work programme that no matter how each mandate was actually worded (i.e., as a negotiation, an exchange of views, or an examination) the CD was in reality a *negotiating* body. This explanation was designed to accommodate Members for whom anything less concrete than a negotiation, resulting in a binding outcome, was unacceptable.

14. The Amorim proposal’s establishment of four Ad Hoc Committees and the accompanying Presidential Declaration was to become a kind of prototype for future programme of work proposals. Such an approach sought to provide assurances to Members that the CD would actively deal with all four core issues, thus enabling the CD to move forward with negotiations on a fissile material treaty within the framework of the Shannon Mandate by mitigating concerns that the other core issues might become ignored over time. But the differences among the four mandates proved to be an obstacle, in that these differences raised the question of whether or not the mandate for a particular core issue would culminate in a legally binding outcome (i.e. a treaty).

1.5 Negotiation versus discussion

15. In 2003 a programme of work proposal was tabled, CD/1693 (later CD/1693 Rev. 1), accompanied by a “Presidential Declaration”. This effort was dubbed the “A5” proposal (for “five Ambassadors”, the former CD presidents, of cross-regional origin, responsible for the proposal¹¹). CD/1693 Rev.1 addressed the four core issues through the establishment of Ad Hoc Committees, one with the mandate to negotiate a fissile material treaty on the basis of the Shannon Mandate; one with the mandate to negotiate with a view to reaching agreement on NSAs; one with the mandate to exchange information and views on practical steps for progressive and systematic efforts toward nuclear disarmament; and one with the mandate to identify and examine, without limitation, any specific topics or proposals on PAROS.
16. The A5 proposal was similar, but not identical, to Amorim’s, but there was a subtle difference in the accompanying Presidential Declaration. In terms of divergent views on whether the treatment of a particular issue should—through “negotiations”—result in a treaty, the Declaration stated that the products of the Ad Hoc Committees could lead “in time, to international instruments acceptable to all”.
17. Nonetheless, the CD remained unable to reach consensus. While China was willing to accept the terms of the proposal regarding PAROS, the US administration under President George W. Bush began in 2002 a two-year review of its policy regarding the fissile material treaty, preventing the CD from reaching consensus on a programme of work. In July 2004, following this review, the United States announced that it could support the negotiation of a legally binding ban on the production of fissile material for explosive purposes. Two years later, however, it concluded that it could not support a treaty under the parameters of the Shannon Mandate, claiming that such a treaty could not be effectively verified. In May 2006 the United States tabled a treaty proposal together with a draft mandate (CD/1776 and CD/1777) that did not include verification, a significant departure from

¹⁰ Ibid.

¹¹ Algeria (Dembri), Belgium (Lint), Chile (Vega), Colombia (Reyes) and Sweden (Salander).

the Shannon Mandate. The US position effectively prevented further progress in the CD under the Shannon Mandate during the following years.

1.6 Coordinators instead of Working Groups

18. In March 2007 the six presidents of the Conference, continuing a practice begun the previous year of working together to provide cohesion and continuity, tabled CD/2007/L.1. This document proposed the appointment of coordinators—rather than subsidiary bodies (such as Working Groups or Ad Hoc Committees)—to chair informal sessions of the CD on each of the core issues, and called for continuing work on the three remaining substantive items on the CD’s agenda, items 5, 6 and 7.¹² The approach of appointing coordinators instead of establishing subsidiary bodies was an attempt to overcome sensitivities among those few Members who were reluctant for mandates to be carried out through Working Groups or Ad Hoc Committees.
19. The coordinator for fissile materials would be given the following mandate by CD/2007/L.1: “to preside over negotiations, without any preconditions, on a non-discriminatory and multilateral treaty banning the production of fissile material for nuclear weapons or other explosive devices”. The coordinators for the other core issues were mandated to preside over “substantive discussions” rather than “negotiations”.¹³

1.7 Outcomes: treaties or lesser instruments?

20. A “Complementary Presidential Statement” (CD/2007/CRP.6) was devised to accompany the proposed draft decision by the Conference, offering assurance that CD/2007/L.1 did not prejudice any past, present or future issue, nor did it set preconditions, or prescribe or preclude any outcome.¹⁴ Once again, the complementary statement was intended to make the proposed work programme acceptable to those who sought legally binding outcomes on the remaining core issues (thus overcoming the linkages problem), as well as keeping options open for addressing contentious issues, most notably the issue of scope. However, consensus on the programme of work still remained out of reach—this proposal, like the Amorim and A5 proposals, was not submitted to the CD for a formal decision. In each case, it was the judgement of the president, based on extensive consultations, that although very widely supported, none of the proposals would have attracted the necessary consensus to be adopted.
21. In 2008 the six presidents for that year introduced in CD/1840 a further refinement aimed at improving the prospects for consensus on a programme of work. This document followed the comprehensive approach used in the previous drafts and proposals. It would appoint a coordinator to preside over “negotiations” on a fissile material treaty, and all delegations would have “the opportunity to actively pursue their respective positions and priorities, and to submit proposals on any issue they deem relevant in the course of the negotiations”. This proposal sought to meet the needs of Members such as Pakistan that would not accept a mandate on fissile materials *without* mention of verification, and

12 Item 5 is “new types of weapons of mass destruction and new systems of such weapons; radiological weapons”, item 6 is “comprehensive programme of disarmament”, and item 7 is “transparency in armaments”.

13 Conference on Disarmament, *Presidential Draft Decision*, document CD/2007/L.1, 29 June 2007.

14 Conference on Disarmament, *Draft Decision by the Conference*, document CD/2007/CRP.6, 30 August 2007.

of the United States, which would not accept a mandate on fissile materials *with* mention of verification.

22. CD/1840 also would appoint individual coordinators to preside over “substantive discussions” on the three other core issues (disarmament, PAROS and NSAs). Moreover, in the cases of those other issues, CD/1840 kept the assurance of CD/2007/CRP.6 that the decision would not proscribe or preclude any outcome of the substantive discussions.¹⁵ Again, due to lack of support the proposal was not submitted to the CD for decision.

1.8 Breakthrough

23. In 29 May 2009, CD/1863, tabled by the presidency as a “draft decision for the establishment of a programme of work for the 2009 session”, was submitted to the CD for decision by Algerian Ambassador Idriss Jazairy, on his final day as president, and drew no objections. It was adopted and became CD/1864.

24. Instead of Ad Hoc Committees or coordinators, the agreed programme of work established four Working Groups with the following mandates:

- to “negotiate a treaty banning the production of fissile material ... on the basis of [the Shannon Mandate]”;
- “to exchange views and information on practical steps for [nuclear disarmament], including on approaches toward potential future work of multilateral character”;
- “to discuss substantively, without limitation, all issues related to the prevention of an arms race in outer space”; and
- “to discuss substantively, without limitation, with a view to elaborating recommendations dealing with all aspects of [NSAs], not excluding those related to an internationally legally binding instrument”.¹⁶

25. All four mandates included the stipulation that each Working Group would “take into consideration all relevant views and proposals, past, present and future”. Each Working Group was also required to report to the CD on the progress of its work before the conclusion of the current (annual) session.

26. Close perusal of the four mandates shows not only qualitative differences among them, but also how they have been refined over time. The evolution of mandates other than that dealing with fissile materials will not be considered here. But, given the linkages referred to earlier, it should be noted that consensus on a programme of work was made possible through compromises made over time in relation to non-insistence on a negotiating mandate for PAROS (China, Russia), non-insistence on a negotiating mandate on NSAs¹⁷ by a number of Non-Aligned Group members, and revised instructions on verification (United States) following the election of US President Barack Obama.

15 Conference on Disarmament, *Draft Decision by the Presidents of the 2008 Session of the Conference of Disarmament*, document CD/1840, 13 March 2008.

16 Conference on Disarmament, *Decision for the Establishment of a Programme of Work for the 2009 Session*, document CD/1864, 29 May 2009.

17 See CD/1624, para. 4 and CD/1693/Rev.1, para. 1

1.9 Return to the Shannon Mandate

27. Through CD/1864, the CD returned to the Shannon Mandate, albeit as one of a number of other substantial and complex items on its programme of work for 2009. Whereas in 1998 the CD had two negotiating mandates to pursue, the decision in 2009 entailed only one negotiation but three other substantive undertakings and a further three issues to explore for possible future treatment. However, as the CD subsequently failed to implement its 2009 decision, CD/1864 proved as short-lived as CD/1547.
28. Implementation of CD/1864 proved impossible because no consensus could be found on the means to give effect to it. These related to the schedule of activities or allocation of time under which each mandate would be addressed by the Working Groups and to the appointment of Chairs of those bodies. Extensive efforts were made by successive Presidents to meet concerns of several delegations (principally China and Pakistan), culminating in a proposed draft decision contained in CD/1870/Rev.1. Before that proposal developed a life of its own, Pakistan put forward an alternative approach that would have had the effect of undercutting CD/1864 by obliging the CD to ensure “equal treatment and priority to all agenda items of the Conference ... in terms of substantive outcomes consistent with the principle of equal and undiminished security for all states”.¹⁸ Ultimately, the CD ran out of time to implement CD/1864, and, worse, no understandings were reached on carrying over that decision to the ensuing year.¹⁹
29. Implicit in Pakistan’s position was one of withdrawal from the consensus on CD/1864. Pakistan apparently felt, on reflection, that its national security interests were not adequately protected by that decision. At the least, it wanted a clearer expression in the fissile material mandate of the treatment to be given to existing stocks of those materials. At the most (as was made explicit a year later during the opening plenary meeting of the 2011 session of the CD²⁰), it did not want the Conference to proceed with a fissile material negotiation for the meantime (perhaps to allow it more time to develop its own stocks).
30. At the beginning of 2010, Pakistan referred to and tabled in the Conference a press statement from its highest decision making body on strategic issues, the National Command Authority (NCA).²¹ The Authority, chaired by the Prime Minister, noted that the “India-specific exemption made by the Nuclear Suppliers Group ... and subsequent nuclear fuel supply agreements with several countries, would enable India to produce substantial quantities of fissile material for nuclear weapons by freeing up its domestic resources”. The NCA also stated that as far as the “consideration” of a fissile material treaty in the CD was concerned, “selective and discriminatory measures that perpetuate regional instability, in any form and manner, derogate from the objectives of nuclear disarmament and non-proliferation and, therefore, cannot be accepted or endorsed”.

18 Conference on Disarmament, *Letter dated 21 August 2009 from the Permanent Representative of Pakistan addressed to the President of the Conference on Disarmament transmitting Pakistan’s position on the implementation of the programme of work (CD/1864) for the 2009 session of the Conference*, document CD/1873, 24 August 2009, preambular para. d.

19 Rule 28 of the CD’s Rules of Procedure requires the Conference to establish, at the beginning of its annual session, its programme of work for that session. It was open to the CD to agree to carry CD/1864 over to 2010, but in light of Pakistan’s position, it was not tenable to do so.

20 In a formal statement on 25 January 2011.

21 See Conference on Disarmament, *Letter dated 19 January 2010 from the Permanent Representative of Pakistan addressed to the President of the Conference on Disarmament transmitting the text of the press statement issued by Pakistan’s National Command Authority dated 13 January 2010*, document CD/1883, 22 January 2010.

The statement continued that Pakistan would not support any approach or measure that was prejudicial to its legitimate national security interests.

31. The notions of equal treatment and equal priority for all agenda items and for the programme of work were insisted upon by Pakistan and several other states throughout 2010, and there were echoes of them in a statement by the Group of 21 on 7 June²² via the term “consensual, balanced and comprehensive” in relation to the work programme, and even in Action 15 of the Final Document of the 2010 NPT Review Conference—“all states agree that the Conference on Disarmament should, within the context of an agreed, comprehensive and balanced programme of work, immediately begin negotiation of a [fissile material] treaty”.
32. Throughout 2010, successive CD Presidents strove to overcome the deadlock inherent in this notion of equal treatment of mandates (also known as the “linkages” issue referred to earlier). Those states that were now conditioning their acceptance of a negotiating mandate for banning the production of fissile materials on obtaining agreement on comparable negotiating mandates for nuclear disarmament and other core issues were in direct conflict with those at the other end of the spectrum for whom a negotiating mandate on any issue other than fissile materials was anathema. Proposal CD/1888 was introduced by Brazil in an effort to provide greater assurance to Pakistan that a negotiating mandate on fissile materials would encompass existing stocks of such materials. Brazil’s idea was in part to emphasize that a treaty on fissile materials would serve an essential nuclear disarmament objective, and in part also to demonstrate that a negotiating structure could be devised in such a way as to create a framework treaty and two protocols, one dealing with verification and the other with stocks existing at the point that the umbrella treaty entered into force.
33. Neither that approach nor a revised work programme (CD/1889) succeeded in bridging the gap, notwithstanding explicit reference in CD/1889 to Pakistan’s position about “ensuring a balanced consideration” and efforts to bridge other implementation concerns. Although many delegations continued to insist that CD/1864—which, after all, had been adopted by consensus—offered the best prospect for getting substantive work underway, this position became increasingly forlorn.
34. The 2010 session concluded without any breakthrough on the programme of work. Before it adjourned, however, there were two developments of note. First, the Conference engaged in some inconclusive introspection about its long-standing impasse, prompted by the calling by the UN Secretary-General of a High Level Meeting to take place in New York on 24 September 2010 on “Revitalizing the Work of the Conference on Disarmament and Taking Forward Multilateral Disarmament Negotiations”. Several working papers were tabled in connection.²³
35. Secondly, in terms of the topic of this background paper, Australia tabled two substantive papers on various aspects of a “Fissile Material Cut-off Treaty”.²⁴ Those two documents along with Brazil’s paper mentioned earlier, a draft Fissile Material Cut-off Treaty prepared by the International Panel on Fissile Materials,²⁵ a paper by the Swiss expert Bruno Pellaud

22 See CD/1887.

23 See CD/1894, CD/1897 and CD/1898.

24 See CD/1895 and CD/1896.

25 See CD/1878.

and an earlier version of this paper were considered by the CD in a short series of informal discussions on fissile materials. But, in terms of substantive negotiations, the year ended empty-handed as it had done for the previous 12 years.

36. At the time of writing, the 2011 annual session has begun on a sobering note with Pakistan, as noted, strengthening its opposition to the negotiation of a fissile material treaty, and suggesting that as it could not accept any work programme containing a negotiating mandate on fissile materials, the CD should focus instead on the three other core issues. It remains to be seen whether the Conference will be able to engage in 2011 in a meaningful manner on the topic of fissile materials, perhaps through a series of structured plenary meetings, or whether the body's stagnation will deepen.

2. Objectives, elements and characteristics of a fissile material treaty

2.1 Possible objectives

37. It is worth bearing in mind the following considerations on the objectives of a fissile material treaty. The weight given to these factors by delegations or groups of delegations will determine the outcome of eventual negotiations:

- Banning the production of fissile materials for nuclear weapons will serve several ends. It will limit the pool of materials available for manufacturing such weapons, thereby benefiting the causes of horizontal and vertical non-proliferation, and lowering the risk of diversion to terrorists.²⁶
- There exists a widespread expectation that an outcome of the negotiations will be the formalization of the longstanding **moratoria** on fissile material production declared unilaterally by France, Russia, the United Kingdom and the United States, extended to cover the other fissile material producers that possess, or are thought to possess or to be in the process of acquiring, nuclear weapons.
- A fissile materials treaty will also aid the cause of nuclear disarmament by making reductions in nuclear arsenals **irreversible**. This will be achieved through the manner in which the treaty ensures that fissile material **declared** excess to weapons needs is prevented from any future use in nuclear weapons. Such an outcome will serve two purposes. It will improve the climate of trust among the nuclear-weapon-possessing states, and at the same time it will help build confidence among non-nuclear-weapon states that real steps toward nuclear disarmament are being taken, provided that this excess fissile material is placed under international safeguards.
- From the emphasis in the Shannon Mandate on the need for a “**non-discriminatory**” regime, it is clear that the final outcome will need to satisfy non-nuclear weapon states that a fissile material treaty would have no discrimination in favour of the nuclear-weapon states. This factor reflects the view among non-nuclear-weapon states that

26 Since 1998, the last occasion on which the CD set up a Working Group on fissile materials, the question of scope has been complicated by concerns about terrorism, giving rise to the question of the wisdom of confining a prohibition merely to the production of highly enriched uranium for explosive purposes.

the bargain underpinning their agreement to the NPT is not being honoured by the nuclear weapon states.

- It would greatly boost the causes of nuclear disarmament and non-proliferation if a treaty covered **existing** stocks of fissile materials as well as **future** production. Even if agreement on existing stocks eludes negotiators, parallel measures outside of a treaty could enhance transparency and facilitate irreversibility.

2.2 Elements of a treaty: questions of scope

38. This section breaks down the “design” choices (to use the words of the International Panel on Fissile Materials), that is, the possible elements on which a future agreement would be based. These elements will determine the ultimate scope of a fissile material treaty, and are relevant to the discussion of other issues, notably definitions (Section 2.3) and verification (Section 2.4), and of possible negotiating scenarios (Section 3).

39. For example, a treaty covering **existing** fissile material stocks as well as **future** stocks will affect the range of verification mechanisms needed to ensure compliance with the terms of the instrument. The success of the eventual treaty will be measured not only by the number of states that formally adhere to it but also by the clarity and effectiveness of the mechanisms through which compliance with its obligations is verifiably secured.

40. Moreover, some elements—especially the question of which stocks will be covered—will be settled only in conjunction with reaching agreement on **definition** of terms. In this regard, delegates will be able to draw on work conducted already, especially that by the International Atomic Energy Agency (IAEA) and the International Panel on Fissile Materials.

2.2.1 Design choices

41. Clearly, the design choices made by the negotiators will determine to what extent the draft treaty can be considered a non-proliferation measure or one which addresses both non-proliferation and nuclear disarmament. The greater degree to which the treaty covers the categories of fissile materials identified in the following paragraph, the more the final product can be regarded as being both a non-proliferation and nuclear disarmament measure.

42. Fissile materials can be classified as follows:

a) Non-explosive:

(i) fissile material produced for civilian purposes (energy production, medicine, maritime propulsion and other uses in non-military facilities or vessels); and

(ii) fissile material produced for non-explosive military purposes (energy production, medicine, maritime propulsion and other such uses in military facilities or vessels).

b) Explosive:

(i) fissile material produced for explosive purposes and which is **already in use** in existing nuclear weapons or which is weapon-grade or weapon-usable²⁷ and has been **stockpiled** awaiting use in weapons;

(ii) fissile material declared in **excess** of weapons needs (i.e., weapon-grade or weapon-usable fissile material which is no longer required for nuclear weapons or which has been extracted from weapons retired from nuclear arsenals); and

(iii) **future production** of fissile material for use for explosive purposes. “Future” means from the date of entry into force of the treaty or such other date as may be determined by it.

43. The mandate given under the CD’s 2009 Programme of Work (CD/1864) to the relevant Working Group is to negotiate a treaty to ban “the production of fissile material for nuclear weapons or other nuclear explosive devices”. Bearing in mind that four of the five NPT-recognized nuclear-weapon states have unilaterally declared moratoria on the production of such fissile materials and that some have engaged in “down-blending” excess stocks, there is already some movement toward this objective.

44. It is also clear from the CD’s 2009 mandate that fissile material that is produced for civilian (i.e. non-military, non-explosive) purposes is not intended to be covered by any prohibition. (The distinction between the types of fissile material that can be used in nuclear weapons and those that cannot is discussed below under “Definitions”.) Fissile material produced for civilian and military non-explosive purposes would be covered by the future treaty to the extent that it would be necessary to provide that both types of material are subject to a regime in which they can be safeguarded, that is, subject to measures that verify the materials are not:

- **diverted** by a state for conversion within that state (e.g. through enrichment) for use in nuclear weapons or other nuclear explosive devices; or
- **transferred** to another state except through proper, safeguarded channels.

45. Materials already being used in weapons or stockpiled for future explosive use raise a complex and divisive set of considerations in terms of coverage by a treaty. Isolating or identifying fissile materials in weapons and stockpiles in existence when a treaty enters into force is a highly sensitive issue in political and practical terms. It would be difficult to reach consensus on a verification regime that was not seen by nuclear-weapon possessors as overly intrusive. The question which negotiators will face, therefore, is whether fissile material already embedded in existing nuclear weapons or in stock for future weapons use should be the subject of agreements other than a fissile material treaty. In any event, while the **future production** of fissile material for explosive purposes would clearly be banned by a treaty, the question of how to deal with **existing** materials will be the central challenge of the negotiations.

²⁷ “Weapons-grade” and “weapons-usable” indicate fissile material that is currently, or capable of being, in use in a nuclear weapon.

2.2.2 Managing excess

46. There would need to be the means to verify that excess weapon-grade fissile material was not being re-used in nuclear weapons or being stockpiled for such use. Inventories of what is excess to weapons needs would have to be established in order to provide a baseline against which to measure progress in the proper disposal of excess stocks. Accurate accounting of these stocks would help ensure that they have not been stolen by terrorists or others or diverted for proliferation or other purposes. The means of accounting would be through (unilateral) declarations or other reporting mechanisms. This will be developed below, but it should be noted here that existing models for reporting stocks such as IAEA's INFCIRC/549²⁸ can serve to assist delegations in developing approaches in increasing transparency.
47. The question of managing excess weapon-grade fissile materials is of fundamental importance given the NPT's obligations on the nuclear-weapon states and the moral and political pressures on the other possessors, that is, those that are not party to the NPT. Given the obligations imposed by article VI, the international community is entitled to expect of a constant flow of declarations of excess fissile material resulting from steady processes for the de-commissioning of nuclear weapons. Future arms reductions accompanied by declarations that the material in these weapons would be placed under international safeguards, will diminish the global stock of fissile materials in an irreversible and transparent manner.²⁹

2.2.3 Future production

48. A fundamental step toward fulfilling a mandate such as CD/1864 is that the treaty would prohibit all future production of fissile material for explosive purposes and that strenuous efforts would be made after the negotiations to universalise the new agreement. Clearly, a producer of such materials that does not become party to the treaty will not legally be subject to the ban.

2.2.4 Stockpiles

49. Strong resistance has been voiced, particularly by the nuclear-weapon states, to the inclusion of existing weapon-grade fissile materials (in warheads, stockpiled as reserves, or excess) within a future treaty. If this resistance is sustained and if delegations are unable to agree that a treaty should encompass existing stocks of weapon-grade fissile materials, the manner of addressing existing fissile materials will need to be rethought. That is not to say that addressing these materials in some shape and form must be abandoned entirely. A middle ground may be achieved, via a "phased" approach, as will be discussed in section 3.1.

28 Since 1997, Belgium, China, France, Germany, Japan, Russia, Switzerland, the United Kingdom and United States have been declaring publicly their stocks of civilian plutonium annually to the IAEA. These declarations (INFCIRC/549) are publicly available at the IAEA website. Some countries now add civilian HEU to their declarations. All the INFCIRC/549 declarations detail the fissile material stocks at reprocessing plants, fuel-fabrication plants, reactors and elsewhere, divided into non-irradiated forms and irradiated fuel.

29 See for instance President Eisenhower's "Atoms for Peace" proposal at <www.iaea.org/About/history_speech.html>.

50. Alternative approaches to the negotiations are developed in section 3.1, but warrant a brief mention here. In the absence of a fissile material treaty which addresses the question of existing military stocks, the relevant states might seek to address this issue in a separate manner following the conclusion of negotiations. These states might be required to:

- implement state **accounting practices** under which weapon-grade material would be controlled; and
- make unilateral **declarations** accounting for such stocks (and, consistent with the NPT, progressive reductions of them).

51. The International Panel on Fissile Materials envisages that initial declarations would simply state total holdings of HEU and plutonium. Ideally, declarations would specify the total quantities of HEU and plutonium in five categories of holdings:

1. Warheads, warhead components and associated working stocks in the warhead-production complexes overall and at individual sites;
2. Material that has been determined excess for military purposes but is still in weapons or weapon components;
3. Reserves for naval and other military-reactor use and in the naval fuel cycle (not including in spent fuel), divided into quantities in classified and unclassified forms;
4. Spent military-reactor fuel; and
5. Civilian stocks, divided into unirradiated and minimally irradiated forms (including in critical assemblies and pulsed reactor cores), and irradiated material in reactor cores and spent fuel.³⁰

52. In the absence of mandatory declarations of such categories of stocks, other approaches that could be pursued include:

- urging nuclear-weapon states that have not already done so to make declarations of their total weapon-grade fissile material stockpiles;
- encouraging the conclusion of agreements to limit the number of national fissile material production facilities for civil applications (enrichment and reprocessing plants) through “multinational nuclear approaches”, incorporating the joint operation of such facilities in a regional context; and
- advocating near-total elimination of the use of HEU as a civilian reactor fuel, and rapid reduction of current civilian plutonium stockpiles through the recycling of mixed-oxide fuel (MOX) in nuclear power plants.

2.3 Definitions

53. A fundamental issue is which materials should be covered by a fissile material treaty—or more precisely, what scientific criteria should be used to determine which materials were within the scope of the treaty and therefore banned. A subset of this issue is whether the production of certain materials could continue under international verification to ensure peaceful use. The main purpose of articles dealing with definitions will be to specify those

30 *Global Fissile Material Report 2009*, International Panel of Fissile Materials, 2009, p. 35.

fissile materials that will be banned and those that will not, distinguishing between fissile materials that have a strictly civilian application and those that are capable of being used in nuclear weapons.

54. Article XX of the IAEA Statute defines **fissile material** as follows:

1. The term “special fissionable material” means plutonium-239; uranium-233; uranium enriched in the isotopes 235 or 233; any material containing one or more of the foregoing; and such other fissionable material as the Board of Governors shall from time to time determine; but the term “special fissionable material” does not include source material.

2. The term “uranium enriched in the isotopes 235 or 233” means uranium containing the isotopes 235 or 233 or both in an amount such that the abundance ratio of the sum of these isotopes to the isotope 238 is greater than the ratio of the isotope 235 to the isotope 238 occurring in nature.

3. The term “source material” means uranium containing the mixture of isotopes occurring in nature; uranium depleted in the isotope 235; thorium; any of the foregoing in the form of metal, alloy, chemical compound, or concentrate; any other material containing one or more of the foregoing in such concentration as the Board of Governors shall from time to time determine; and such other material as the Board of Governors shall from time to time determine.³¹

55. **HEU:** U-235, in nature, makes up only 0.7% of natural uranium. The remainder is almost entirely U-238, which is fissionable but not fissile, that is, it cannot support a chain reaction. Although uranium enriched to 6% U-235 could, in principle, sustain an explosive chain reaction, uranium enriched to above 20% U-235, defined as “highly enriched uranium”, is generally taken to be required for a weapon of practical size. The IAEA therefore considers HEU a “direct use” material, that is, material that can be used in a nuclear weapon without further enrichment. Actual weapons use higher enrichment, however, with “weapon-grade” uranium being enriched to over 90% U-235.

56. **Plutonium:** Plutonium is produced in a nuclear reactor when U-238 absorbs a neutron, creating U-239, which then decays to plutonium-239 (Pu-239). The longer an atom of Pu-239 stays in a reactor after it has been created, the greater the likelihood that it will absorb a second neutron and become Pu-240—or a third or fourth and become Pu-241 or Pu-242. Plutonium therefore comes in a variety of isotopic mixtures. Weapon designers prefer to work with a mixture that is as rich in Pu-239 as feasible because of its relatively low rate of radioactive heat generation and relatively low rate of spontaneous neutron and gamma ray emission. Weapon-grade plutonium contains more than 90% of the isotope Pu-239. Plutonium in spent fuel from a power reactor typically contains between 50 and 60% Pu-239, and about 25% Pu-240.

57. It was once believed that the plutonium generated in power reactors could not be used for weapons. It was thought that the large fraction of Pu-240 in “reactor-grade” plutonium would reduce the explosive yield of a weapon to insignificance. However, more modern weapon designs are not as sensitive to the isotopic mix in the plutonium and virtually any combination of plutonium isotopes can be used to make a nuclear weapon. While the

31 Interpretations and background information on the IAEA definition can be found on the website of the International Panel on Fissile Materials at <www.fissilematerials.org/ipfm/pages_us_en/fissile/fissile/fissile.php>.

higher neutron production rate from reactor-grade plutonium reduces the probable yield to an extent, the result is still a devastating weapon.

58. At the lowest level of sophistication, a potential proliferating state or non-state actor, using designs and technologies from the first-generation of nuclear weapons, could build a nuclear weapon from reactor-grade plutonium that would have an assured, reliable yield of one or a few kilotons (and a probable yield significantly higher than that). At the other end of the spectrum, advanced nuclear weapon states such as the United States and Russia, using modern designs, could produce weapons from reactor-grade plutonium having reliable explosive yields, weight, and other characteristics generally comparable to those of weapons made from weapon-grade plutonium.
59. **Other Fissile Materials:** In addition to plutonium, other weapon-useable fissile materials can be produced by irradiating different target materials in nuclear reactors or by the decay of certain isotopes of plutonium. Among these are U-233, neptunium-237, and americium-241. While Pu-239 and U-235 are the dominant fissile materials used in the weapons programmes of all the nuclear-weapon states, the United States, at least, has tested designs containing U-233. France, and perhaps other nuclear weapon states, may have experimented with neptunium-237 in nuclear tests.

2.4 Verification

60. Options for mechanisms developed to verify that a fissile material production ban is being upheld depend on decisions on the scope of the proposed treaty. The following paragraphs discuss various approaches that could be taken, including whether negotiators should take a comprehensive approach similar to the Comprehensive Nuclear-Test-Ban Treaty (CTBT) and embed detailed articles on verification within the agreement, or rather simply develop a framework that would be built upon in a separate instrument.

2.4.1 Verification mechanisms within the treaty

61. In a sense, the verification of the presence of nuclear materials is easier than the verification of chemical and biological agents, given the radioactivity emitted by fissile materials and the inherently **dual-use** capacity of biological and chemical products. Determining the purpose for which nuclear materials will be used, nonetheless, is far from straightforward given the secrecy with which nuclear weapons are produced and stockpiled.
62. While the production of some fissile materials will be banned, the production of others will not, although the latter are likely to be subject to a mechanism for ensuring that they will not be converted for use in weapons. It can thus be assumed that the primary focus of verification would be on **production facilities**. Which relevant facilities will need to be addressed? Determining the elements of the production chain that will be subject to the verification mechanism will need attention, both as a matter of scope and definition.
63. The key principles and requirements of verifying compliance with the terms of the treaty will also depend on a sound understanding of the technologies of fissile material production and the techniques and technologies available for verification. Issues such as monitoring of declared sites, required declarations, routine and random (or “challenge”) inspections, inspection of undeclared sites, and the rights, responsibilities and protections of the inspected party as well as of the inspectors, must all be addressed in the negotiations.

2.4.2 Verification mechanisms alongside the treaty

64. The negotiators must determine whether the treaty will be self-contained in regards to verification or, like the NPT, set out the basic principles, leaving the details for elaboration in an additional instrument or series of instruments.³² However, it should be borne in mind that the future treaty will complement the NPT regime under which non-nuclear-weapon states are, in effect, already subject to a prohibition on producing fissile materials for explosive purposes,³³ with compliance verified by the IAEA.
65. If negotiators choose to subcontract the IAEA and draw on the existing verification tools utilized by the IAEA in fulfilling its mandate to verify nuclear material in states that have safeguards agreements with the Agency, a fissile material treaty could provide for the current IAEA-based NPT safeguards system to be used as a basis for demonstrating compliance of NPT non-nuclear weapon states with the treaty. This outcome presumes the willingness of states not party to the NPT to acquiesce in the inclusion of such an arrangement in a fissile material treaty, a factor that could be addressed by treating the IAEA's role under the new treaty as simply parallel—rather than formally related—to its NPT role.
66. The safeguards system for non-nuclear-weapon states is designed to enable the IAEA to draw conclusions concerning:
- the peaceful use of all declared nuclear material in a state; and
 - the existence of undeclared nuclear material and activities in a state.
67. The IAEA's ability to draw the second of these two conclusions is heightened when a state has an Additional Protocol in place. Full implementation of the IAEA safeguards system in a state with which the IAEA has a comprehensive safeguards agreement and an Additional Protocol in place would permit the IAEA to make an annual determination of treaty compliance in terms of assuring that there has been no diversion of fissile materials from declared use and no undeclared activities.

32 For example, such instruments could be similar to safeguards agreements concluded between non-nuclear-weapon states and the IAEA via that Agency's Comprehensive Safeguards Agreement (INFCIRC/153) and the Model Additional Protocol (INFCIRC/540). See also INFCIRC/66 (which established the pre-NPT safeguards regime) in its application to non-NPT nuclear weapon states. "Safeguard", a term for verifying that a material and its use are indeed what they purport to be, is a concept that stems from the NPT and the IAEA.

33 Article III, paragraphs 1 and 2 of the NPT read (emphasis added):

1. Each non-nuclear-weapon State Party to the Treaty undertakes to accept safeguards, as set forth in an agreement to be negotiated and concluded with the International Atomic Energy Agency in accordance with the Statute of the International Atomic Energy Agency and the Agency's safeguards system, for the exclusive purpose of verification of the fulfillment of its obligations assumed under this Treaty with a view to preventing diversion of nuclear energy from peaceful uses to nuclear weapons or other nuclear explosive devices. Procedures for the safeguards required by this article shall be followed with respect to source or special fissionable material whether it is being produced, processed or used in any principal nuclear facility or is outside any such facility. The safeguards required by this article shall be applied to all source or special fissionable material in all peaceful nuclear activities within the territory of such State, under its jurisdiction, or carried out under its control anywhere.

2. Each State Party to the Treaty undertakes not to provide: (a) source or special fissionable material, or (b) equipment or material especially designed or prepared for the processing, use or production of special fissionable material, to any non-nuclear-weapon State for peaceful purposes, unless the source or special fissionable material shall be subject to the safeguards required by this article.

68. If negotiators agreed to use the IAEA safeguards system as the verification mechanism for a fissile material treaty, non-nuclear-weapon states that do not currently have a comprehensive safeguards agreement and an Additional Protocol in place would have to adopt these standards in order to allow verification of their full compliance with the treaty. In the case of non-nuclear-weapon states which already have a comprehensive safeguards agreement and the Additional Protocol in place, a fissile material treaty is unlikely to impose burdensome new obligations.
69. To fulfil any mandate requiring that fissile material treaty negotiations must result in a “non-discriminatory outcome”, such as the Shannon Mandate or CD/1864, negotiators would need to adapt the IAEA safeguards system, or applicable elements of it, for use in states to which it is not currently applied, that is, NPT nuclear-weapon states and states not party to the NPT. Obligations that would be undertaken by these states would likely need to include the following:
- no diversion of fissile material to weapons programmes;
 - no undeclared production of such material; and
 - no transfer of fissile material.
70. Depending on the extent of the scope of the future treaty, other verification measures that go beyond the current IAEA safeguards system could also be developed within the treaty, or in parallel to it in a separate instrument or protocol, if there is consensus in the negotiations to do so. In any event, a fissile material verification regime should include measures to build a high level of confidence that all States Parties would be in compliance with their treaty-based commitment not to produce fissile material for nuclear weapons or other nuclear explosive devices.

2.4.3 Alternative verification mechanisms and approaches

71. While the application of IAEA safeguards measures to states producing fissile materials would be advantageous, alternative verification measures could be considered as a fallback, drawing on experience gained in the negotiation and implementation of other nuclear non-proliferation, arms control and disarmament treaties and initiatives, for example the Intermediate Range Nuclear Forces (INF) Treaty, the Strategic Arms Limitation Talks (SALT), the Treaty on Strategic Offensive Arm (START) and the Trilateral Initiative. These verification measures could be pursued multilaterally, bilaterally or through “national technical means”³⁴ with the verification conclusions drawn from such activities being shared with all states parties to the treaty.
72. There are also several procedural options for articulating the verification obligations. For instance, if negotiators decide that only the principles and general considerations relating

34 “... all nuclear arms control agreements are likely to depend, at least to begin with, upon relatively non-intrusive verification techniques. It was the development of ‘national technical means of verification’ that helped pave the way for SALT I, the chief means being satellite observation (photographic, electronic, early warning, and radiation) coupled with agreement by each state not to interfere with the other’s “national technical means”. While such techniques gather information of great military significance, they do not require the physical presence of the verifying state in the state whose activities are being verified”; D.A.V. Fischer, “Safeguards—a model for general arms control?”, *IAEA Bulletin*, vol. 24, no. 2, 1982, p. 48.

to verification need to be set out in the treaty, they may wish to leave the specification of technical details, procedures and technologies to be developed in a separate instrument with, or without, the same legal force as the framework, or head, agreement. Given that verification technologies are constantly evolving, it might be an inefficient use of negotiating time to follow the CTBT precedent of specifying them in the treaty text itself.

2.4.4 Costs of verification

73. The costs of a verification mechanism will not be insignificant. Obviously, the more ambitious the mechanism, the greater will be its cost. For instance, the verification of all nuclear facilities in the nuclear-weapon-possessing states would entail a more comprehensive and intensive monitoring, inspection and surveillance system than is already required in non-nuclear-weapon states. Finding a formula to share such costs will be a fraught, time-consuming and highly political task.
74. Pursuing **existing** verification mechanisms, however, such as those just noted, would have the benefit of limiting the costs of verification. The verification system—whether specified in the treaty or in an ancillary instrument—could, at least initially, incorporate **existing** verification techniques and technologies in order to build upon approaches that are already in place and in which states have a high degree of confidence. The regime could be further supplemented through the use of tools akin to those developed, for example, under the Biological Weapons Convention, such as confidence building measures, that serve to promote transparency and thus compliance.

2.5 Entry into force

75. The rules that govern the manner and time of a treaty's entry into force are sometimes crucial to its ultimate success. As the CTBT has shown, setting the threshold for the number and types of states parties that must adhere to an agreement in order to bring it into force as legally binding international instrument is a complex and politically sensitive calculation. With a fissile material treaty, that calculation will involve reaching consensus that the instrument will enter into force once a specified number of states in general have ratified or acceded to it—the orthodox approach in treaty law—or once a specified number of particular states have ratified or acceded to it (e.g. fissile material producers).
76. An agreement that imposes a production ban will have maximum effect if all producers bind themselves to imposing that ban. This does not necessarily mean that the article on entry into force needs to stipulate that all producers must adhere to the treaty before it can enter into force. On the other hand, the number of states that are regarded as producers might help to inform the decision on the appropriate threshold for entry into force. For example, with a total of around 40 states that currently produce fissile materials for civilian or military purposes, it would increase the effectiveness of the treaty if entry into force would not occur until 25 or 30 of those states had become party to it.
77. As for the starting date, the traditional approach is that binding legal obligations take effect from the date of the treaty's entry into force. That precise date for individual states parties is either:

- the date on which the treaty reaches a specified threshold of states (or specified states) adhering to it, including the individual state in question, thus entering into force; or
- the date on which that state lodges its instrument of ratification or accession or the date on which any period of delayed application expires. (For example, some treaties specify that they will enter into force for the new party six months after that state deposits its instrument of ratification or accession with the depositary.)

2.6 Review

78. Advantages of including in the treaty a provision for its regular review are that:

- concerns about implementation can routinely be raised, debated and acted upon if necessary;
- provisions dealing with technical matters, such as the technology used for verification, can be revisited if the technology in question becomes obsolete or if new means and methods emerge; and
- more generally, any states that hold concerns about the manner in which the regime may unfold might find it easier to adhere to the treaty if it provides an assurance that its terms can be reviewed.

79. It is widespread practice in the disarmament arena to review the operation and implementation of treaties every five years, supplemented by annual meetings of states parties as a means of preparing for the five-year review.

2.7 Compliance

80. A state party to a treaty is expected to—and must—comply with its terms as a matter of international law. Compliance provisions in a treaty can, nonetheless, serve two main purposes:

- they may establish a mechanism to handle potential or suspected breaches, such as through the circulation of a notice to states parties for consideration at a Review Conference or a regular or extraordinary meeting of states parties; and
- they may go further than that, providing a mechanism for the tasking of a fact-finding inquiry or an investigation, for example, by the UN Secretary-General.

2.8 Amendment

81. An article establishing a procedure for amending the treaty may build in some flexibility to respond to unforeseen events or effects. Normally, however, an amendment does not come into formal effect until states individually signify their acceptance of it, resulting often in significant delays, although states can be expected to apply it informally in the meantime.³⁵

35 See, for example, article VIII of the NPT.

3. Possible negotiating scenarios

82. The complex nature of the subject matter and the interdependencies among the key issues present a real challenge to the negotiation of a fissile material treaty. In his farewell statement in the CD on 2 July 2009, German Ambassador Bernhard Brasach observed that there is a triangular relationship between definitions, scope and verification, noting that these three issues will need to be “fine-tuned neatly to each other in parallel throughout the negotiations”.³⁶
83. These remarks arise from a concern to avoid focusing initially on definitions without having first explored the issues of scope and verification. Using the word “scope” in the broadest sense, clearly the way forward will be determined by gauging the parameters of the negotiations in the initial, general phase of negotiations. Definitions in treaties are normally a means to an end, that is, they are included in order to assist with interpreting matters of substance. They are of course substantive in their own right but they are generally not ends in themselves.
84. Ambassador Brasach’s comments also allude to the linkage that exists between the scope of the production ban and verification. As mentioned earlier, the actual extent of the ban agreed by negotiators will determine the verification measures required to provide the level of effectiveness of the regime envisaged by the mandate.
85. The negotiators of the CTBT grappled on three fronts: with definitions, including that of nuclear explosions (the zero-yield issue); with scope, in terms of setting a threshold for the yield of tests and deciding whether to cover peaceful nuclear explosions; and with the relationship between scope and verification, and the resulting intrusiveness of verification. In the case of the CTBT, monitoring of the obligation to not carry out any nuclear explosion is clearly more effectively achieved than would have been the monitoring of nuclear explosions that were permitted so long as they did not exceed a specified yield.
86. Several considerations arise from the dilemma of where and how to begin the negotiations. First, there is the practical matter of how to stage the negotiations. There is the option of a triangular approach envisaged by the German Ambassador, in which the negotiations on definitions, scope and verification are carried out in a manner that recognizes their inter-relatedness.
87. At one level, this entails that debate must identify, then resolve, the divergences emerging in the Working Group. On the one hand, it will be important not to let the debate go round circles among the three issues. On the other hand, it will be important that the negotiations are conducted in such a way as to avoid fixations, especially on definitions and scope. Clearly verification mechanisms can only sensibly be discussed when the scope of the proposed treaty becomes clearer. Avoiding these pitfalls will require close coordination and cooperation among those chairing the respective negotiations.
88. At another level, it will be necessary to identify and chart the main options at issue. For instance, once the debate has matured to a point where all initial negotiating positions have been tabled, it may be useful for the Working Group chair to produce a compilation

36 The full statement can be found at <[www.unog.ch/80256EDD006B8954/\(httpAssets\)/3AB4598F0FD5D9BAC12575E7004E33CB/\\$file/1146_Germany.pdf](http://www.unog.ch/80256EDD006B8954/(httpAssets)/3AB4598F0FD5D9BAC12575E7004E33CB/$file/1146_Germany.pdf)>.

which identifies the relationships among scope, definitions and verification for each of the major divergent positions of the delegations. The purpose would be to clarify things for the next round of the negotiations. The chair of the Working Group will from time to time need to pull together the inter-connecting threads of these three areas, refining them as negotiations intensify.

89. Another major matter for consideration by negotiators is whether, and if so at what point, to designate “Friends of the Chair” or set up sub-groups on key issues. At issue is whether parallel negotiations on scope, definitions and verification—a division of effort comparable to that used in the CTBT negotiations—will reduce or heighten the risk of duplication of effort or wasted effort.
90. The need for technical and scientific inputs through the work of a group of experts has been raised by a number of delegations during past discussions on fissile materials. Such a device was viewed as helpful in laying foundations in the case of the CTBT negotiations. Expert inputs to the CTBT occurred over a number of years prior to the actual negotiation and were focused on verification mechanisms. Whether a similar level of work is required for a fissile material treaty, given the experience embodied in the IAEA, will depend on the extent to which there is agreement over the adoption of IAEA verification expertise in the fissile material regime. In any event, delegations would presumably wish to provide any such group of experts with a clear mandate and a time frame for the completion of its inputs.

3.1 Other approaches to the negotiations

91. If consensus cannot be reached on the application of legally binding obligations to existing stocks of fissile materials, the negotiations will have reached a crossroads. While it will be clear in the treaty that the ban will prevent future production of fissile materials for explosive purposes after entry into force, a major loophole would exist if the prescribed verification regime were unable to differentiate between stocks held at the date of entry into force and stocks produced illegally after that date. What are the options?
92. These options could range from a legally binding duty contained within the treaty obliging nuclear-weapon-possessing states to declare their existing stocks and have these declarations subject to verification, to an outcome based only on trust. Or, there might be an initial political declaration by nuclear-weapon-possessing states to a moratorium on the production of fissile materials or, in the case of a state that already maintains a moratorium, to signify that it accepts that the moratorium will become legally binding. Realistically, the compromise seems likely to fall somewhere between these extremes, perhaps utilizing declarations based on state accounting and control that would establish inventories in which, as a minimum, fissile material deemed to be excess to weapons needs would come under international safeguards.
93. Such a compromise entails what has been described as a **phased**³⁷ approach. The significance of considering a phased approach to the negotiations lies in the potential for improving the prospects of consensus. Such an approach is one in which the eventual product of the CD and its fissile material Working Group is complemented by the parallel

37 See Paul Meyer, “A Fissile Material (Cut-off) Treaty: some observations on scope and verification”, *Disarmament Diplomacy*, no. 91, 2009.

action of individual states. (Agreement to initiate preparatory work on fissile materials through a group of experts before the negotiations begin is another example of a phased approach.)

94. The outcome would be a framework treaty setting out general principles and basic norms of the new regime, together with provisions for transparency measures and possibly other mandatory or voluntary steps to be undertaken in a parallel or further phase of the process. That (final) phase might include implementation protocols covering verification and any aspect of scope not negotiated in detail for the framework treaty, perhaps including specific issues such as the use of fissile material for naval propulsion.³⁸
95. Another way of approaching the negotiations is to adopt a **functional** perspective. This would entail looking at the *kinds* of ban that delegations might wish to pursue. In doing so, it would provide a ready focus for the negotiations, facilitating the ability to rise above potential deadlock on the issue of existing versus future stocks. This approach would concentrate on developing bans on activities that result in:
- the “reversion”, or recommissioning, of production facilities that were once used for nuclear weapon purposes;
 - the reversion of production facilities that were originally used for nuclear weapon purposes but which had subsequently been converted to non-nuclear-weapon purposes;
 - the recycling for weapon use of fissile material that was once used for nuclear weapons but which had been declared excess. (It would be necessary, however, to permit recycling of plutonium removed from weapons as long as this did not involve the production of new fissile material for weapon use);
 - the diversion of fissile materials from non-weapon use to weapon use; and
 - the transfer of fissile material having potential for weapon use. (Given the possibility that civilian-grade fissile material could be enriched for weapon use, it would be necessary to ban transfers to non-state parties not already bound under the NPT not to produce fissile material for nuclear weapons or nuclear explosive purposes).

4. Conclusion

96. While the negotiation of a fissile material treaty will not be straightforward, its successful conclusion will have significant international benefits. By limiting the pool of materials available for manufacturing nuclear weapons and by helping to make reductions in nuclear arsenals irreversible, the treaty will be a major boost to the causes of non-proliferation and nuclear disarmament. A non-discriminatory treaty also has the potential to strengthen the NPT, notably in the manner in which the nuclear-weapon states might be brought more formally into the IAEA safeguards system and in which nuclear-weapon-possessing states outside the NPT might be brought into closer cooperation with NPT states parties.

38 See Germany, *Creating a new momentum for a fissile material cut-off treaty (FMCT)*, document NPT/CONF.2010/PC.II/WP.21, 30 April 2008.

97. More broadly, a fissile material treaty would be a welcome, if belated, addition to the measures governing disarmament, non-proliferation and arms control, making a crucial contribution to improving the climate of trust at a time of high concern about the international security environment.

Annex A: Relevant CD documents

Shannon report
CD/1299, 24 March 1995

Canada: transmitting papers of a workshop held in Toronto, 16–19 January 1995
CD/1302, 30 March 1995

Canada: transmitting a publication on verification
CD/1304, 4 April 1995

USA: Statement by President Clinton
CD/1441, 22 January 1997

Canada: Working paper on an Ad Hoc Committee on an FMCT
CD/1485, 21 January 1998

USA: Statement from the President
CD/1490, 28 January 1998

Draft Decision on the establishment of an Ad Hoc Committee
CD/1492, 3 February 1998

Report of a seminar on FMCT held in Geneva, 11–12 May 1998
CD/1516, 28 May 1998

Sweden: Joint declaration
CD/1542, 11 June 1998

Algeria: proposal under agenda item 1
CD/1545, 31 July 1998

Decision on the establishment of an Ad Hoc Committee under agenda item 1
CD/1547, 11 August 1998

Statement by the President following adoption of CD/1547
CD/1548, 11 August 1998

Statement by the G21
CD/1549, 12 August 1998

Austria: Statement by the Foreign Minister
CD/1550, 12 August 1998

The Philippines: Statement by the Foreign Minister
CD/1551, 18 August 1998

Report of the Ad Hoc Committee under agenda item 1
CD/1555, 1 September 1998

Working paper: elements of an approach to dealing with stocks of fissile materials
CD/1578, 18 March 1999

Japan: Report of the Tokyo Forum
CD/1590, 19 August 1999

Finland: Declaration by the EU on fissile materials
CD/1593, 6 September 1999

Mexico: portion of text adopted at the 2000 NPT RevCon
CD/1614, 25 May 2000

South Africa: Working paper: possible scope and requirements of the FMT
CD/1671, 28 May 2002

Addendum to CD/1671
CD/1671/Add.1, 23 August

The Netherlands: Summary of an informal meeting on fissile materials held in Geneva, 7 June 2002
CD/1676, 19 June 2002

Ireland: paper submitted by the New Agenda Coalition (NAC) to the first PrepCom of the 2005 NPT RevCon
CD/1683*, 3 September 2002

The Netherlands: Summary of a second informal meeting on fissile materials held in Geneva, 25 September 2002
CD/1691, 13 January 2003

The Netherlands: Summary of a fourth informal meeting on fissile materials held in Geneva, 4 April 2003
CD/1705, 26 May 2003

New Zealand: paper submitted by the NAC to the second PrepCom of the 2005 NPT RevCon
CD/1707, 26 May 2003

UK: Working paper submitted to the second PrepCom of the 2005 NPT RevCon
CD/1709, 17 June 2003

Japan: Working paper on a FMCT treaty
CD/1714, 19 August 2003

The Netherlands: Summary of a fifth informal meeting on fissile materials held in Geneva, 26 September 2003
CD/1719, 9 October 2003

Italy: EU strategy against proliferation of WMD
CD/1724, 31 December 2003

The Netherlands: Summary of a sixth informal meeting on fissile materials held in Geneva, 2 April 2004
CD/1734, 7 May 2004

The Netherlands: Common position of the EU to the 2005 NPT RevCon
CD/1751, 10 June 2005

Malaysia: Working paper by the NAM to the 2005 NPT RevCon
CD/1752, 27 June 2005

Canada: Elements of an approach to dealing with stocks of fissile materials for nuclear weapons or other nuclear explosive devices
CD/1770, 4 May 2006

Switzerland: A pragmatic approach to the verification of an FMCT
CD/1771, 12 May 2006

Italy: Banning the production of fissile material to prevent catastrophic nuclear terrorism
CD/1772, 15 May 2006

Italy: FMCT's entry into force: possible options
CD/1773, 15 May 2006

Japan: FMCT: a contribution to constructive discussions
CD/1774, 16 May 2006

Australia: Suggestions for progressing the FMCT
CD/1775, 17 May 2006

USA: Draft mandate for an Ad Hoc Committee on a FMCT
CD/1776, 19 May 2006

USA: Draft FMCT
CD/1777, 19 May 2006

USA: White paper on a Fissile Material Cutoff Treaty
CD/1782, 22 May 2006

Canada: An FMCT scope–verification arrangement
CD/1819, 21 March 2007

Reports of the seven Coordinators on the work done during the 2007 session
CD/1827, 16 August 2007

Reports of the seven Coordinators on the work done during the 2008 session
CD/1846, 15 August 2008

Draft schedule of activities from 29 June to 18 September 2009
CD/1866, 23 June 2009

Draft schedule of activities from 3 August to 18 September 2009
CD/1866/Rev.1, 30 June 2009

Draft decision on the implementation of CD/1864
CD/1867**, 25 June 2009

Draft decision on the implementation of CD/1864
CD/1870*, 4 August 2009

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CD/1870/Rev.1, 6 August 2009

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CD/1873, 24 August 2009

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CD/1877, 15 December 2009

The Netherlands and Japan: draft for discussion prepared by the International Panel on Fissile Materials: "a treaty banning the production of fissile materials for nuclear weapons or other explosive devices, with article-by-article explanations"
CD/1878, 15 December 2009

Pakistan: press statement issued by Pakistan's national command authority dated 13 January 2010
CD/1883, 22 January 2010

Proposals of the Group of 21 presented at the 1182nd plenary meeting
CD/1887, 7 June 2010

Brazil: Proposal on the structure of a treaty on fissile material for nuclear weapons or other nuclear explosive devices
CD/1888, 14 June 2010

Draft decision for the establishment of a programme of work for the 2010 session
CD/1889, 6 July 2010

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CD/1894, 14 September 2010

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Italy, Working paper, Revitalizing the Conference on Disarmament
CD/1897, 14 September 2010

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CD/1898, 14 September 2010

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Further Information

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<www.acronym.org.uk>

Arms Control Today

Archived issues of the periodical published by the Arms Control Association.

<www.armscontrol.org>

Carnegie Endowment for International Peace

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International Atomic Energy Agency


Regulatory organization within the UN system, working with Member States and partners worldwide to promote safe, secure and peaceful nuclear technology.

<www.iaea.org>

International Panel on Fissile Materials

Independent group of nuclear and non-proliferation experts tasked with analysing the technical basis for policies to secure and reduce stockpiles of plutonium and highly enriched uranium.

<www.fissilematerials.org>



James Martin Center for Nonproliferation Studies
Dedicated to research and training to combat the proliferation of nuclear weapons.
Publisher of *The Nonproliferation Review*.
<cns.miis.edu/index.htm>

Nuclear Suppliers Group
A group of nuclear supplier countries which seeks to contribute to the non-proliferation of nuclear weapons through the implementation of guidelines for nuclear exports and nuclear-related exports.
<www.nuclearsuppliersgroup.org>

Verification Research, Training and Information Centre
VERTIC promotes effective and efficient verification as a means of ensuring confidence in the implementation of international agreements and intra-national agreements with international involvement.
<www.vertic.org>

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