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THE FUTURE OF A TREATY BANNING FISSILE MATERIAL FOR WEAPONS PURPOSES: IS IT STILL RELEVANT?

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The acceptance by China and the Russian Federation of a comprise proposal to break the six year long deadlock in the Conference on Disarmament (CD) over its program of work, has renewed optimism that progress towards a fissile material treaty (FM(C)T)[*] would be possible during 2004. Although not yet agreed to by all CD members, the acceptance of an innovative proposal by five former CD presidents - the "five ambassadors" or A-5 proposal - as amended in June last year, presented an opportunity to start negotiations in the CD on a FMT without linking it to progress on an international legal instrument on the prevention of an arms race in outer space (PAROS) and a program for nuclear disarmament. China and the Russian Federation have long argued that the reconvening of an ad hoc committee to negotiate a FMT should be linked an ad hoc committee to negotiate a treaty on PAROS. The Group of 21 (CD members of the Non-Aligned Movement) also insisted that a third ad hoc CD committee to discuss nuclear disarmament should be established and that all three committees should work in parallel. Most CD members already indicated their acceptance of the "five ambassadors proposal", while the United States, France and some G-21 states such as Pakistan are yet to state their positions.

The current threats presented by both vertical and horizontal nuclear weapon proliferation, place new emphasis on the need to prevent plutonium or highly-enriched uranium from being used to make a nuclear explosive device. There are essentially two general responses to this challenge: regulation (which accepts the existence of existing stocks and continued production, albeit under stricter security conditions) or prohibition (which seeks to eliminate threats by eliminating the material rather than just eternally seeking to improve conditions of use). The majority of States support either one of these position, or a combination thereof. The more recent proposals by the Director-General of the International Atomic Energy Agency, Dr. Mohammed ElBaradei and later by U.S. President George W. Bush added another dimension to the equation, i.e. whether to include fissile material for civilian use under a future FMT.

This paper investigates the continued relevance of a FMT more than ten years after it was first introduced in the General Assembly. Moreover, given the increasing threat of nuclear terrorism and the misuse of civilian nuclear fuel cycles, the continued relevance of a treaty banning only the production of fissile material ban for nuclear weapons is evaluated. It provides a brief background to the history leading to the current impasse in negotiations in the CD and anchors a FMT in the NPT as part of its nuclear nonproliferation and nuclear disarmament objectives. It also provides a synopsis of the different positions of States on especially the scope of a future treaty. Given these

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[*] NOTE: Given the longstanding differences over the scope of the treaty, the term "FMT" is used throughout this paper

different perspectives, the paper identifies a number of basic principles and objectives for the treaty to remain relevant as a nonproliferation and disarmament tool. Since the scope of a future FMT remains one of the most contentious issues, various options and requirements are considered. The final section deals with options to effectively verify the implementation of the treaty in a non-discriminatory way.

The paper concludes that an effective, credible and verifiable FMT should halt further production and bring transparency and accountability to the vast stockpiles of weapons usable material located around the world. However, for a FMT to remain relevant for the majority of states, the long-aspired goal to limit not only the production of nuclear weapons usable fissile material should also address concerns over existing stockpiles of such materials. Given the growing risks of nuclear terrorism, and the potential threats posed by radiological weapons, a related question that should be addressed is whether the world would be better off with no production of separated plutonium or highly-enriched uranium – and the progressive elimination of existing stockpiles – or with regulated, limitless production of such materials by some States today, and more States tomorrow. Given the longstanding deadlock to start negotiations, the paper suggests that the solution to the problem is no longer one of semantics, but of higher political nature that would require careful reflection at the highest political level by all CD members.

BACKGROUND

A ban on the production of fissile materials for nuclear weapons has been on the international security agenda since the mid-1940s. Ironically, so have been the ideas proposed by Dr. Elbaradei and President Bush. In 1946, the United Nations Atomic Energy Commission adopted the Baruch Plan, a proposal put forward by the United States for international control over all dangerous aspects of the nuclear fuel cycle. President Eisenhower's "Atoms for Peace" Speech in 1953 further developed this idea, hinting at a ban on fissile material production by stating that "the United States would seek more than the mere reduction or elimination of atomic materials for military purposes"[2]. During the 1960s, when the negotiations for a NPT were in progress, a ban on the production of fissile materials for military purposes was included in a group of measures - together with a comprehensive test ban treaty, reductions in the nuclear arsenals of the nuclear-weapon powers, and the international management, control, and storage of plutonium. Proposals of this kind were made in 1964 by President Johnson, in 1969 by President Nixon, and by others.

After 1978, resolutions calling for a ban on the production of fissile materials for nuclear weapons were regularly passed by the General Assembly but there was little hope of progress during the Cold War. In 1982, at the United Nations Second Special Session on Disarmament, the Soviet Union for the first time proposed a cut-off in production as a step to freeze nuclear weapons. Several other countries also put forward their resolutions to the UN General Assembly. In 1982, India tabled a resolution "A Freeze on Nuclear Weapons," calling on all nuclear weapon states to stop production of nuclear weapons as well as cut-off production of fissile material for weapons purposes.[3] This resolution was merged in 1988 with a Mexican resolution on the same subject.[4]

With the end of the Cold War and the perceived need to make progress in arms control, the concept of a FMT as a separate instrument was given considerable impetus by the United States. In his speech to the United Nations General Assembly in September 1993, President Bill Clinton stated that: "We will pursue new steps to control the materials for nuclear weapons. Growing global stockpiles of plutonium and highly enriched uranium are raising the danger of nuclear terrorism in all nations. We will press for international agreement that would ban production of these materials for ever."[5]

The same General Assembly in December 1993, for the first time adopted a consensus resolution entitled 'Prohibition of the production of fissile materials for nuclear weapons or other nuclear explosive devices'[6]. The resolution recommended "the negotiation in the most appropriate international forum of a non-discriminatory multilateral and internationally and effectively verifiable treaty banning the production of fissile material for nuclear weapons or other nuclear explosive devices."[7] The General Assembly envisaged the treaty to cover the production of weapon-grade plutonium (plutonium containing more than 93 per cent of the isotope plutonium-239), weapon-grade highly-enriched uranium (uranium enriched to over 90 per cent uranium-235), and uranium-233 for nuclear weapons or other nuclear explosive devices, or outside of international safeguards. The General Assembly also requested the IAEA to provide assistance for examination of verification arrangements for such a treaty, but it did specify the Agency's role. Although previous UN resolutions referred to the "production and stockpiling" of fissile materials, the 1993 resolution dropped reference to stockpiles in order to gain consensus.[8] Similarly, although the General Assembly resolution described the treaty banning production as "a significant contribution to nuclear non-proliferation in all its aspects," it did not specifically address existing stocks of fissile materials.

Upon commencement of its first session for 1994, the Conference on Disarmament (CD), on 25 January 1994, appointed Ambassador Gerald E. Shannon (from Canada) as Special Co-coordinator to "seek the views of its members on the most appropriate arrangement to negotiate" a FMT. Ambassador's Shannon's consultations soon indicated that despite the wide support for the negotiations of a FMT to be conducted in the CD, that there were differing views on the scope of such a treaty (i.e. whether it would include the past production as well as the future production of fissile materials for nuclear weapons). A little over a year later (in March 1995) Ambassador Shannon reported to the CD that consensus was reached on the mandate for a FMT and on the establishment of an "Ad hoc Committee to negotiate a non-discriminatory, multilateral and internationally and effectively verifiable treaty banning the production of fissile material for nuclear weapons or other explosive devices."[9]

While the difficulty in defining the scope of the ban was not resolved, the adoption of the mandate was achieved by a compromise. In his report, Ambassador Shannon stated that many delegations expressed concerns about the appropriate scope of such a treaty. Some delegations supported a mandate that would only permit consideration of future production of fissile material. The five NPT nuclear weapon States (NWS) and India rejected attempts to address past production, arguing that the 1993 General Assembly resolution only dealt with future production. Other delegations (in particular Pakistan, Iran, Egypt and Algeria) argued that the mandate should also include consideration of past production. Another group of States felt that consideration

of a FMT should not only relate to production of fissile materials (past or future), but also to other issues, such as the management of such material. Several delegations insisted on the inclusion of existing stockpiles in the negotiation mandate.

When the CD adopted the Shannon report (CD/1299) in March 1995, it agreed to establish an ad hoc Committee "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."[10] Although the negotiating mandate for the ad hoc Committee was based on the 1993 General Assembly resolution, the report did not preclude any delegation from raising the issues of scope and verification within the Committee.

Discussions in the CD failed to make further progress until after the 1998 Indian and Pakistani nuclear-weapon tests. Until then, a number of CD members, mainly from the G-21, wanted the negotiation of a FMT to be linked with discussions of a phased timetable of nuclear disarmament. Four out of the five NPT NWS (with the exception of China, who also made a link to negotiations on PAROS) have consistently refused to agree to such linkage. At the end of its 1998 session, the CD did establish an ad hoc committee to start negotiations on a FMCT chaired by Canadian Ambassador Mark Moher. Very little progress was made before the 1998 session ended. The CD has since been deadlocked over its program of work, especially given past linkages between negotiations on a FMT and a PAROS treaty.

In an effort to bridge the gap between the different positions of key member states, particularly the United States and China, various past CD presidents have submitted proposals for a program work based on their intensive consultations. The so-called Five Ambassadors Proposal (CD/1693), put forward by former CD presidents Dembri (Algeria), Lint (Belgium), Reyes (Colombia), Salander (Sweden), and Vega (Chile) provided a clear negotiating mandate for a fissile material ban, while directing an Ad Hoc Committee on PAROS to "deal with" the issue "without limitation and without prejudice."[11] The PAROS mandate was subsequently amended according to suggestions submitted by China (CD/1693/Rev.1). The amended mandate directs an Ad Hoc Committee on PAROS to deal with the issue "without limitation", "including the possibility of negotiating relevant international legal instrument."[12] Significant progress was made on 7 August 2003, when China and Russia accepted the amended proposal, and joined the emerging consensus on a program of work. However, since the United States has so far remained silent on this proposal, a most pessimistic analyst could conclude that China suggested the amended language anticipating that the United States would not accept it. France has also not yet expressed support for the Proposal, mainly due to the indirect linkage with a parallel approach to nuclear disarmament. Even though Pakistan indicated its agreement as part of the G-21 position during the CD presidential consultations, it continues to make linkages between the negotiations of a FMT and to the need for the CD to deal with nuclear disarmament in an equal manner. Some would argue that Pakistan too does no longer favor an FMT given its small nuclear arsenal *vis-à-vis* that of India.

A BAN ON FISSILE MATERIAL AS AN OBJECTIVE OF THE NPT

The objectives of a fissile material ban treaty have been defined more clearly in the NPT context. A principal objective of the NPT is nuclear disarmament (along with the objectives of non-proliferation, technical verification, non-proliferation controls and the promotion of the peaceful uses of nuclear energy). As such the Treaty anticipates the cessation of the nuclear arms race and the achievement of the elimination of nuclear weapons. Although not directly addressed in the articles of the Treaty, clear reference to the "cessation of the manufacture of nuclear weapons, the liquidation of all (their) existing stockpiles, and the elimination from national arsenals of nuclear weapons and their means of delivery" is made in the preamble to the Treaty. This "desire" is further emphasized in Article VI which requires State parties to undertake "negotiations in good faith on effective measures to cessation of the nuclear arms race at an early date and to nuclear disarmament".

In achieving the goals of the NPT, control over nuclear weapons materials and the cessation of their production for weapons purposes would be important steps in the complex political and technical process of nuclear disarmament. Nuclear weapons may range in sophistication from fission weapons to boosted weapons, thermonuclear weapons, fission-fusion-fission weapons and enhanced radiation weapons. All require certain specialized materials for their construction. Ceasing the production of such materials could lead to a quantitative capping of the number of weapons in existence and to laying the foundation for their eventual elimination.

The 1995 NPT Review and Extension Conference adopted the Principles and Objectives for Nuclear Non-proliferation and Disarmament, which recognized a fissile material ban as an important disarmament measure for "the full realization and effective implementation of article VI." It called for the immediate commencement and early conclusion of fissile material ban negotiations in the CD as part of a three phased-program of action on nuclear disarmament. The 13 steps for nuclear disarmament contained in the Final Document of the 2000 NPT Review Conference further urged the CD to commence negotiations on a treaty, with a view to their conclusion within five years. It is important to note that the State parties agreed that such a treaty should take into consideration "both nuclear disarmament and nuclear non-proliferation objectives," defining the scope of a treaty more clearly than the Shannon report. After the conclusion of the Comprehensive Test Ban Treaty (CTBT) negotiations and its subsequent adoption in 1996, negotiating a FMT is seen as the next logical step for nonproliferation and nuclear disarmament.

The promise of a FMT also played a prominent role in advocating the indefinite extension of the NPT at the 1995 NPT Review and Extension Conference. At least one NWS - the United States - launched a campaign among key non-nuclear weapon States (NNWS) arguing that in addition to its commitment to achieving a CTBT and the reduction of nuclear warheads by both the United States and the Russian Federation under the START I and II treaties, that its proposal on a global ban on the production of nuclear material for weapons are linked to the indefinite extension of the NPT. However, the package of integral decisions adopted at the 1995 Conference, provided a way for all State parties to support the indefinite decision while providing for the means in which, and the means through which progress toward achieving nuclear disarmament and nonproliferation could be achieved. A very important part of this package is the "Principle and Objectives for Nuclear Non-proliferation and Disarmament" which

included a call for the "immediate commencement and early conclusion of negotiations of a FMT in accordance with the Shannon mandate.

At the 2000 NPT Review Conference, the NWS gave an unequivocal undertaking to accomplish the total elimination of their nuclear arsenals as part of thirteen practical steps for the systematic and progressive efforts to implement Article VI, and the program of action agreed to at the 1995 Conference. Another important component of these practical steps was the agreement on the necessity of negotiations in the CD on a "non-discriminatory, multilateral and internationally and effectively verifiable treaty banning the production of fissile material for nuclear weapons or other explosive devices in accordance with the statement of the Special Coordinator in 1995 and the mandate contained therein, taking into consideration both nuclear disarmament and nuclear non-proliferation objectives"[13]. The CD was also urged to agree on a program of work to allow for the immediate commencement of negotiations on such a treaty with a view to its conclusion within five years. The 2000 agreement is significant since it not only solidified the 1995 agreement to immediately start negotiations on the FMT, but it also added a timeframe for the conclusion of such negotiations. Even more important was the consensus agreement among all State parties that the negotiations of a FMT should to take into consideration both nuclear disarmament and nuclear non-proliferation objectives. This agreement clearly widened the Shannon mandate to include consideration of exiting fissile material stocks. Unfortunately though, the agreement to conclude a FMT by 2005 was negated when the sponsors of General Assembly resolution 56/24J dropped the reference to five years (in order to achieve consensus) from the text of this resolution calling on the CD to start negotiations on the treaty.[14]

The big question facing the State parties today is whether this objective – or for that matter, the objectives to prevent nuclear proliferation and nuclear terrorism as well -- can ever be achieved in a world where the continued production, transportation, export, and use of weapons-usable nuclear material is allowed, condoned, and even promoted? Chances for success appear least auspicious in a climate of chronic non-compliance with nuclear disarmament commitments, coupled with schemes to merely regulate weapons-usable nuclear materials. If judged by the experience at the most recent NPT Preparatory Committee meeting in April/May 2004, an honest assessment would be that the prospect of progress toward achieving the NPT's disarmament goals is slim at best. Since many undertakings given at both the 1995 and 2000 NPT Conferences have been forgotten, or in some case abrogated (especially the support for the CTBT), it begs the question whether the ideal of achieving a FMT, with both nuclear nonproliferation and disarmament objectives, is still relevant.

DIFFERENT PERSPECTIVES ON A FISSILE MATERIAL BAN TREATY

Even if the CD were to start negotiating a FMT, widely different views remain on the scope of a treaty. Roughly speaking, there are three key positions in the CD on the scope issue. First, the five NWS, India and Israel hold that a FMT should only cover future production, and not existing stocks. Second, most of the G-21 states demand that existing stocks be included and verification be comprehensive. Third, other CD member states, including European states, Japan and Australia, prefer a gradual approach,

whereby existing stocks would not directly be dealt with in the negotiation of a treaty, but that options should be kept open for a more substantive consideration in the future.

Four of the five NWS - France, Russia, the United Kingdom, and the United States- have already unilaterally placed moratoria on their production of plutonium and HEU for weapons purposes. While supporting a ban on future production of fissile material, they are all opposed to the inclusion of past production for varying reasons. With a more modest arsenal and much smaller amount of fissile material, both France and the United Kingdom are against including existing stocks into the scope of a treaty. They are also sensitive to any treatment of civilian nuclear programs in negotiations due to the extensive influence of domestic nuclear industries.[15]

While the United States and the Russian Federation have declared portions of their stocks excess to the military requirements, they refuse to discuss the issue of stocks in a multilateral forum. The United States has made it clear that it would not agree to any restrictions on existing stocks in a fissile material ban. Since the two countries are already engaged in bilateral efforts, such as the "Plutonium Production Reactor Agreement" (which stops plutonium production in the two States and includes reciprocal inspections), the United States argues that these efforts remain the most effective way to address the issue.[16]

Russia considers the inclusion of existing stockpiles as equal to immediate nuclear disarmament, which it considers to be unrealistic. It holds that "a comprehensive nuclear disarmament has to be reached gradually without any hampering and at the same time without any haste."[17] Attaching special importance to minimizing financial costs, Russia is opposed to a comprehensive treaty that would require verifications of a large number of nuclear facilities.[18] This is also due to the facts that almost all former military nuclear facilities in Russia are not designed for safeguards activities, and that military and civilian nuclear activities are traditionally closely interlinked.[19]

Despite its official support for a FMT, and its most recent acceptance of the compromise proposal on the CD's program of work, China may regard a FMT as having a negative impact on its future nuclear deterrence capability. Although China is believed to have stopped the production of fissile materials for military purposes, it has never declared a moratorium as the other NWS did. Being suspicious about the true intention of a U.S. missile defense system, China fears that such missile defense will undermine the second strike capability of its smaller nuclear force. Secondly, given its relatively small military stock of plutonium, China could also be concerned about the growing "peaceful" plutonium stockpiles of Japan and India.[20] Therefore, China could be keeping its option open to expand its nuclear arsenal, which might require the production of fissile materials in the future. China's acceptance of the compromise in the CD, knowing that the United States would not be willing to do so, could be merely a ploy to deflect negative criticisms that it has been blocking progress on the negotiations of a FMT.

The G-21 States (with the exception of India) insist on the inclusion of past production, since a FMT that does not address stockpiles would freeze the status quo of nuclear capable countries, including those outside the NPT, and therefore not fulfill the NAM's disarmament objectives.

India, however, is opposed to the inclusion of existing stocks for several reasons. In the regional context, India hopes to keep its military stocks higher than Pakistan's and to achieve parity with that of China. India is also sensitive to the nature of materials and

facilities that need to be safeguarded. India's military production is interlinked with civilian production, thereby making comprehensive verification a difficult option.[21] In addition, India's position will be greatly affected by domestic politics and the influence of different groups within the country.[22] Unless a fissile material ban is accompanied by time-bound undertakings by the NPT NWS for nuclear disarmament, hawkish Indian policy makers might regard a fissile material ban as a mechanism to cap, roll back, and eliminate its nuclear capabilities. India might on the other hand support a fissile material ban that includes stocks if such a ban is placed firmly in the context of further measures to achieve nuclear disarmament.

In regards to Pakistan, the other South Asian nuclear power, it seems determined not to accept a FMT that does not include past production, because such a treaty would leave India's stockpiles larger than its own. Being a crucial ally of the United States in its war against terrorism, Pakistan's enhanced diplomatic leverage with the United States may allow it to pursue a stronger position during negotiations of a FMT. As mentioned earlier, Pakistan, despite agreeing to the G-21 position on the A-5 proposal, continues to link the negotiations for a FMT with that of nuclear disarmament, leaving the impression that it is using the United States' current lack of support for this compromise as a means to by-pass the G-21 position. Pakistan's statement during the April 2004 UN Security Council debate on the nonproliferation resolution adopted by the Council[23] further adds fuel to suspicions that the linkage between Pakistan's support for a FMT with equal progress towards nuclear disarmament, is just a smoke screen for its own reluctance to pursue a production ban. The statement by the Pakistani Ambassador to the UN Security Council seems to imply that Pakistan intends to continue producing fissile material for weapons purposes: "Pakistan will continue to develop its nuclear, missiles and related strategic capability to maintain the minimum credible deterrence *vis-à-vis* our eastern neighbour, which is embarked on major programmes for nuclear weapons, missiles, anti-missile and conventional arms acquisition and development." [24]

Although in favor of the inclusion of existing stocks in a treaty, South Africa holds a more pragmatic position compared to other G-21 states. Well aware of the difficulties associated with the issue of fissile material stocks (given the small stockpile from its former weapons program), South Africa proposed "a practical, achievable and effective manner of dealing with the issue in a way that fulfills nuclear disarmament and non-proliferation objectives."[25] During May 2002, South Africa put forward a working paper in the CD on "The possible scope and requirements of the Fissile Material Treaty (FMT)" (CD/1671), which arose from South Africa's practical experience in building and then destroying its nuclear weapon program. The paper argues that for pragmatic and political reasons, the declaration of stocks of weapons materials by all nuclear-capable states would not be feasible, while materials declared as excess could be included as a starting point. It also stresses that a fissile material ban should not undermine commercial nuclear energy programs, in which South Africa has vested interests, but should focus on the future production of nuclear materials.[26]

Mexico (and also Egypt) favors a comprehensive fissile material ban, arguing that fissile materials could be clandestinely diverted for weapons purposes as long as the commercial separation of plutonium and enrichment of uranium is permitted.

The Arab League G-21 members are obviously concerned about the stockpiles at the Dimona nuclear reactors in Israel, and continuously argue that a FMT should include stockpiles so as to promote nuclear disarmament in the Middle East.

Israel has one of the narrowest perspectives on the scope a fissile material ban, let alone the inclusion of past production. Since its nuclear ambiguity is virtually non-existent, Israel seems to be concerned about intrusive inspections at the Dimona facility and pressure from Arab countries for its transparency. When the CD took a decision in 1995 to establish an ad hoc committee to negotiate a fissile material ban, Israel stated that it did not object to this agreement to negotiate, but "reserved its position on the substance of the issues involved."[27] Its current position on a FMT negotiation is also ambiguous at best. In his statement to the CD on 20 January 2003, Ambassador Levy referred to Israel's position on the CD's program of work: "When a proposal is made that is broadly accepted, primarily by the relevant parties to the current disagreement, Israel will determine its position on its merits."[28] With dim prospects for the Peace Process in Palestine, and the continuing tense relations with the Arab countries in the region, Israel is likely to keep every option open to ensure its national security, in which its nuclear capabilities play an important part. U.S. pressure would be key to changing Israel's position on a fissile material ban negotiation.

The positions of most other CD members are in between those who want to include existing stocks and those who do not. The majority of the CD members seem to believe that the issue of existing stockpiles should not complicate the negotiation process, while recognizing the need to address the issue at a later stage or in a parallel, but separate process.[29] In this regard, the position of the Netherlands, Japan and Australia are of particular interest. The Netherlands has been playing a leading role in promoting a FMT outside the CD plenary meetings. Since 2002, it has regularly organized open-ended informal meetings that focused on the scope and verification of a treaty. The Netherlands seems to support a two-track approach in regard the issue of scope. In parallel with the negotiation of a "cut-off" treaty, another treaty covering existing stocks would be considered as a next step towards nuclear disarmament.[30] The stock issue would complicate negotiation and delay the early achievement of an agreement, which the Netherlands sees as more important.[31] On the verification aspects of a treaty, the Netherlands prefers a more comprehensive approach to cover civilian and research reactors, since they might well be used for clandestine processing activities.

Japan, is also working on a two-track approach, pending the agreement on a program of work at the CD. Japan's approach is to keep the momentum and technical expertise on a fissile material ban by promoting education and public awareness outside the CD.[32] To this end, Japan has co-organized workshops on a fissile material ban with Australia. Japan is also actively pursuing substantive discussions on a FMT in the CD plenary meetings. The objective of this approach is to prepare delegations to begin negotiations immediately once a program of work is agreed upon.[33] Japan's view on a fissile material ban is somewhat different from that of the Netherlands. While flexible on the inclusion of stocks, Japan stresses that substantial technical deliberations should be focused on future production to avoid prolonged negotiations. As a country with a large nuclear industry, Japan has repeatedly rejected the idea that a FMT should include fissile material for the peaceful use of nuclear energy. It holds the view that the Shannon mandate clearly precludes fissile material for commercial purposes from the scope of the

prohibition. Japan would most definitely create difficulties for any attempt to widen the scope of a FMT to include reprocessing of spent fuel in civilian nuclear programs.

Another interesting approach is that of Australia, which resembles that of the Netherlands. Introduced at the 1998 NPT PrepCom, Australia argues that a FMT should not be a stand-alone instrument, but should rather serve as a framework instrument which would evolve into a comprehensive regime governing the production, stockpiling, management and disposition of fissile material.[34] As a first step, the Australians proposed to codify a ban on production – the true cut-off approach. But they also called for a second agreement to increase transparency over fissile material inventories and to gradually bring existing stocks under strict and effective international control. The main objective with this approach is to "fix-in a legally binding multilateral instrument" the existing moratoria by four out of the five NPT NWS, so as to prevent these moratoria from dissipating. Presumably, it is also aimed at bringing the fifth NWS – China – into the fold. This approach is also intended to address unsafeguarded production facilities in the three non-NPT States. The basis for Australia's two tier approach is their argument that "sooner or later, multilateral verification of both fissile material production facilities and fissile material stockpiles" would need to be included – hence the need for a second agreement.

Although the Australian and Japanese approaches seem to be achievable, they will not meet the national and regional security interests of the three non-NPT States in particular. Given their traditional positions of linking their own disarmament with that of the other (NPT) NWS, and/or regional security matters, India, Israel and Pakistan are not likely to agree on an accord that would ban only future production without some linkages to these issues. Given the experience with the CTBT, and the backtracking by the NWS on their 1995 and 2000 undertakings, it is doubtful whether the NPT NWS and the three de facto NWS would agree to pursue an even more far reaching agreement once a ban on production has been secured.

THE CONTINUED RELEVANCE OF A FISSILE MATERIAL BAN MEASURED AGAINST TODAY'S CHALLENGES

The international security environment has changed substantially since the idea of a fissile material ban was first introduced in the mid-1940s. A fissile material ban today would affect individual states differently due to variance in nuclear fuel cycles and inventories of fissile material. States also have different views on the objectives of a fissile material ban. It would therefore be appropriate to consider whether a FMT is still relevant in today's security context, and if so how. In doing so, the relevancy of a treaty should be measured against the following principles and objectives:

1. Importance of and respect for multilaterally negotiated treaties

The negotiation of a "non-discriminatory, multilateral and internationally and effectively verifiable treaty" banning the production of fissile material for nuclear weapons will only be effective if there is a reaffirmation of the importance of, and respect for, treaties such as the CTBT. For the State parties to the NPT, the pursuit of such

accords would be in conformity with the principle objectives of the NPT. Recent history has shown, however, that some states, in particular those most relevant to a FMT, have either walked away from existing treaties such as the ABM and START II treaties, or, as in the cases of India and the United States, decided not to sign or ratify the CTBT after participating in the negotiations in good faith.

2. **The need for multilateral negotiations**

In evaluating potential options for a FMT, a careful interpretation of "multilateral" is required. A very narrow interpretation will mean that all States, i.e. all UN members should be involved. Traditionally such global or universal treaties are negotiated in fora such as the CD depending of course on their nature and scope. This route has been deadlocked for several years. Alternatively, a treaty could also be multilaterally negotiated among those States which currently possess fissile material and related productions facilities, or, as a starting point among the five NPT NWS and the three *de facto* NWS. Since all nuclear facilities in NPT NNWS are technically covered by comprehensive safeguards agreements with the IAEA, a FMT negotiated among these eight States would place their unsafeguarded nuclear productions facilities and their stocks of weapons-usable fissile material under some form of verification, preferable under IAEA supervision. The expectation held by the majority of States that a FMT should be part of a step by step nuclear disarmament process, will likely dictate a more inclusive process. However, this step by step process has been partly responsible for the past impasse in the CD. In the past it led to an artificial hierarchy of measures, such as the conclusions of negotiations for the CTBT, to be followed by negotiations on FMCT, accompanied by the START series of agreements as part of the commitment by the NPT NWS to negotiate in good faith leading to nuclear disarmament, and general and complete disarmament.

Although the FMT is intended to be a multilateral treaty, the practical effect of the Treaty will primarily impact only a few States that produce, or that are capable of producing or possessing nuclear materials that can be used for nuclear explosive purposes. A more sensible approach could be to focus on the source of the problem, i.e. the fissile material and production facilities in the five NPT NWS and the three de facto NWS. Thus rather than following the traditional multilateral approach, a more pragmatic approach would be for a treaty to be initially drafted by the 8 "nuclear weapons States", in consultation with other NNWS to ensure agreement on the general parameters of the treaty[35].

3. **Nonproliferation: Covering only military production**

This is the most commonly pursued goal under the Shannon mandate for a FMT. By banning the production of weapons-usable material, a ban on military production of fissile material would eventually cap the total number of nuclear weapons that can be made. Such quantitative limits would complement the qualitative limits set by the CTBT, reducing both vertical and horizontal proliferation. However, since all production facilities in NNWS are already subject to the full-scope safeguards under the NPT[36], the only additional nonproliferation benefits of such a ban would be that verification measures be expanded to include the NWS including the *de facto* nuclear weapons possessors (India, Pakistan and Israel), where most of the production facilities are

currently unsafeguarded. In this sense, a fissile material ban would extend the nonproliferation norm established by the NPT for NNWS to the eight NWS.[37] For this reason, one of the crucial objectives of a ban on military production of fissile material is to bring India, Israel and Pakistan into the international nonproliferation regime.

A ban on military production would also make the unilateral moratoria issued by the NWS legally binding and subject to international verification, thereby strengthening their political commitments to nonproliferation. However, since many NNWS favor a comprehensive FMT, they will insist that a treaty should cover not only military production activities but that civilian nuclear activities in the NWS should also be subject inspections. They see a fissile material ban as a means to equalize the safeguards burden between the NWS and the NNWS, thereby reducing discrimination inherent in the NPT regime.[38]

In the regional context, a fissile material ban would have a direct impact on the security situations in South Asia and the Middle East. It would not only contribute to curb regional proliferation, but also serve as a confidence building measure in those volatile regions. By adhering to a fissile material ban, India and Pakistan could signal their political commitment to avoid open nuclear competition and to restrain their nuclear programs.[39] Israel's commitment not to produce new fissile material would be a first important step to build mutual trust between Israel and the Arab states in the region, and eventually to establish a Middle East zone free of nuclear weapons.

4. **Nonproliferation: Including civil production**

There is now well over 200 tons of separated plutonium in civilian stockpiles around the world, and this figure has been increasing at some 15 tons of plutonium each year. Although this civil plutonium is largely "reactor-grade," it is all weapon-usable. Any state or non-state actor that is able to make a nuclear weapon from weapon-grade plutonium is also likely to be able to make one from reactor-grade plutonium. Although civil plutonium is subject to international safeguards in France and the United Kingdom as well as in NNWS such as Japan and Germany, these safeguards are primarily designed to detect whether the host state is diverting civilian material for military purposes, but not to prevent theft. [40]

The goal to include civil fissile material production under a FMT has become more relevant in recent years, in particular given the nuclear terrorism threat. The Director-General of the International Atomic Energy Agency, Dr. Mohammed ElBaradei announced last fall a series of proposals that would essentially limit processing of weapon-usable material (separated plutonium and high-enriched uranium) in civilian nuclear programs, and to restrict the production of new material through reprocessing and enrichment exclusively to facilities under multinational control. A more recent proposal by U.S. President George W. Bush goes even further by suggesting that no more states be allowed to develop full-scale nuclear fuel cycles, but that leading nuclear exporters (states with existing fuel cycle capabilities) should ensure that (other) states have reliable access at reasonable prices, as long as those states renounce enrichment and reprocessing. President Bush's proposals, however, moves away from the original "deal" in the NPT, i.e. that NNWS will not pursue nuclear weapons, while having access to, and the right to develop their own, nuclear energy under IAEA safeguards.

Given the increasing threat that civilian enrichment and reprocessing capabilities could be misused to develop a clandestine nuclear program, or that they be targeted by non-state actors as potential sources of fissile material, a FMT has the potential to become a platform to also regulate civilian nuclear programs. Any consideration of an effective mechanism to verify a FMT is therefore likely to be pressured to include civilian fuel cycles. The recent "Action Plan for Nonproliferation" adopted at the G-8 Summit in Georgia, U.S.A. by which G-8 members agreed to place a one year moratoria on the supply of equipment and material for the production of fissile material to countries that do not already have it[41], is further indicative of what could be expected in this regard.

However, such a goal is not widely supported, especially not by major producers of civilian fuel. Japan in particular has repeatedly rejected the inclusion of separated plutonium for peaceful purposes in a fissile material ban, arguing that safeguarded peaceful uses of nuclear energy do no harm to the purpose of nuclear non-proliferation and disarmament.[42] Plutonium recycling is also seen as an important part of energy security in France.[43] Since efforts to eliminate HEU in civil research programs have progressed slowly so far, other countries that are opposed to the inclusion of civilian programs include Germany, Belgium, South Africa, France, China and Russia.[44] Therefore, although limitation on commercial nuclear program will significantly contribute to reducing proliferation threats, its acceptance by several countries would be very difficult.

5. **A Nuclear Disarmament component**

As stated above, the disarmament objectives of a FMT have not been clearly defined in the original Shannon mandate, but rather by the NPT State parties themselves. It is important to emphasize that the State parties agreed that a treaty should take into consideration "both nuclear disarmament and nuclear non-proliferation objectives."[45] Total nuclear disarmament will, however, be impractical until all nuclear weapons and weapon-usable materials can all be accounted for, be protected from theft or sabotage, and verified and guaranteed against reversibility.[46] A FMT that covers past production would facilitate the nuclear disarmament process by ensuring the irreversibility of arms reductions. Depending on the scope, it would either verify that materials removed from the dismantled nuclear arsenals are not being used for military purposes or stored in secret, or it would require the disposition of those materials. However, no common agreement exists among States on to what extent a FMT should address nuclear disarmament, or if such a treaty should deal with nuclear disarmament at all. Those who are opposed to including existing stocks regard a FMT primarily as a nonproliferation measure. Others insist that a fissile material ban should not be burdened with the nuclear disarmament agenda, which would probably complicate and prolong negotiations. Even a treaty that only deals with the future production of fissile materials would be a "preparatory" as well as a "useful psychological and symbolic" step toward deep nuclear reductions.[47] On the other hand, those who put priority on nuclear disarmament hold that a fissile material ban should go beyond a nonproliferation mechanism and achieve the actual reduction in nuclear materials.

The fact remains that negotiating a FMT remains the next logical step following the conclusion of the CTBT in 1996. Given the current concerns over a lack of progress in nuclear disarmament, or as some believe, concrete efforts to abrogate the "13 practical

steps", agreement in the CD to start negotiations on a FMT by all 5 NPT NWS will demonstrate their continued commitment to nuclear disarmament as required under Article VI, and the "good faith" undertaking given at the 1995 and 2000 NPT Conferences. Failure to allow such negotiations to commence would further jeopardize the validity of the 13 practical steps as "systematic and progressive efforts" to implement Article VI, if not other agreements reach in 1995 and in 2000. NWS' cherry-picking of which steps to adhere to, could create a dangerous scenario in which these steps could be interpreted as optional rather than as a comprehensive set of measures to which the NWS are legally committed bound.

6. Facing the threat of nuclear terrorism: Physical security of fissile materials and facilities

The physical security of fissile materials and their production facilities has become increasingly important in the post-September 11th environment, given the potential that non-state actors, especially terrorists, could gain access to such materials. Despite existing instruments to improve physical protection, such as the Convention on Nuclear Safety and the Convention on the Physical Protection of Nuclear Material, large inventories of plutonium and HEU are still under-protected, especially in former Soviet Union countries.[48] The former Soviet Union produced the largest stockpile of plutonium and HEU, most of which is now in Russia.[49] Its systems to adequately protect and account for much of the fissile material, however, remain far below international standards, making the stocks possible targets of theft by terrorists, proliferant states, or criminal groups.

In this context, a FMT would serve an important objective: to cap certain types of fissile material and reduce the number of processing facilities that might become potential targets of terrorist seeking to develop an improvised nuclear device (IND). Reduced access to weapons grade HEU and weapons grade plutonium will present added challenges to terrorist seeking to develop INDs.[50] By ending production, a FMT would thus limit the quantity of fissile material that has to be secured from theft. In addition, its stringent international verification would prevent covert insider theft, which is most likely at the stage of the bulk processing involved with large-scale production of nuclear material. A redefined FMT should therefore not only address production and excess stocks, but also measures to improve physical security of nuclear material. States should be encouraged to adopt higher standards for the physical protection of fissile material. In this regard, a FMT could include physical protection features and measures to (a) minimize and control access to weapons usable and other nuclear material, including hazardous radioactive materials, facilities and transport systems; (b) minimize the vulnerability of nuclear plants; (c) provide a response mechanism if an act of nuclear terrorism is suspected or if unauthorized access to weapons usable material and facilities is anticipated; (d) take immediate action to recover any stolen material; and (e) protect vital equipment required to maintain radioactive materials in a safe state. This would also require the establishment of a physical protection inspection service within the IAEA[51].

The contrary view to such a redefinition of the FMT, however, holds that the contribution of a FMT to address nuclear terrorism would be limited. Although a FMT would provide additional opportunities for verification, the already existing United Nations conventions against terrorism, including the draft Convention on Nuclear

Terrorism, as well as the Convention on Nuclear Safety and the Convention on the Physical Protection of Nuclear Material, are deemed by many to be more relevant in this respect.[52] At the very least, a FMT should require its State parties to accede to the Convention on the Physical Protection of Nuclear Material, and implement the IAEA's "Recommendations for the Physical Protection of Nuclear Materials" (INFCIRC/225).

OPTIONS AVAILABLE FOR A FISSILE BAN TREATY: SCOPE AND REQUIREMENTS

For a future FMT to remain relevant as part of the global nonproliferation and disarmament regime, the following scope and requirements of a FMT should be considered:

1. Scope

The scope of a treaty is one of the most challenging issues facing future negotiations. Positions are widely divided since the scope is directly linked to what a treaty should achieve. As there is a general agreement on the need to deal with future production of HEU and plutonium for weapons purpose, the issue of scope mostly concerns whether to include past production, namely, existing stocks. Given that all nuclear materials and facilities in the NNWS are already subject to full-scope safeguards, it is the NWS and the *de facto* nuclear weapons possessors that will be affected by the inclusion of existing stocks. Arguments in favor of including existing stocks are: a) to achieve the nuclear disarmament objective of a treaty, particularly in terms of transparency, accountability, and irreversibility of nuclear materials; b) to further strengthen nonproliferation benefits by preventing transfer of existing materials from NWS or *de facto* nuclear weapons possessors to the NNWS; c) to make a treaty "non-discriminatory" and equalize the safeguards burden between NWS and NNWS; d) to solve the question of asymmetric stocks in South Asia and the Middle East; e) to avoid a loophole for declaring military fissile material produced after treaty's entry into force as past stocks; and f) to prevent those materials from falling into the hands of terrorists.

Those (mostly the NPT NWS) who are against inclusion of existing stocks point to the technical difficulties of accounting all historical stocks, arguing for practicality of focusing on future production. They are also concerned about cost implications of a wider scope. Declaration of historically produced stocks of weapons materials by all States with nuclear weapons is not believed to be feasible. The inclusion of stocks would likely make NWS support for a treaty difficult, thereby complicating and prolonging negotiations. Moreover, if past production of weapons grade material is to be included in "fissile material stocks", a full/complete declaration of such stocks as a requirement of the FMT could be problematic in the negotiations for the treaty, as well as for its subsequent implementation from both a political and a practical perspective. Another argument is that including existing stocks - even just declaring existing military stockpiles - could recognize and codify the right to have such stocks, legitimating the nuclear status of those states outside the NPT.[53]

Disposition of HEU and plutonium has been carried out both unilaterally and bilaterally. Under the HEU Purchase Agreement, the United States pledged to purchase 500 tonnes of Russia's HEU recovered from nuclear weapons. The United States is

blending down much of its own excess HEU. Although these HEU disposition programs are technically simple, they have faced significant financial obstacles.[54] Regarding disposition of plutonium, which is far more difficult than disposition of HEU, the United States and Russia signed the Plutonium Management and Disposition Agreement in 2000. According to the Agreement, both countries must dispose of at least 34 metric tons of excess military plutonium. Although both countries agreed to begin disposition by the end of 2007, it seems that the first disposition would be delayed for several years due to high costs and implementation uncertainties.[55] The IAEA has also not yet been approach to carry out the verification requirements under the agreement.

Judging from the scope of undertakings by the United States and the Russian Federation, disposition of excess military stocks seems to be the furthest point the NWS can go at this stage. Thus, a fissile material ban should also aim at disposing excess military stocks in addition to banning future production, but should not be ambitious to go beyond that. In so doing, a fissile material ban should be able to address those financial and technical problems faced by the United States and Russia in their own initiatives. If a multilateral framework could offer a solution rather than complicating those problems, the NWS, especially the United States and Russia would find incentives to support a treaty.

When considering whether, and how to include past production of weapons-grade plutonium (Pu), it is important to bear in mind that even the most transparent of the NWS, has in doing so revealed a problem of great practical significance, i.e. the fact that no account could be given of about 2 800 kg of Pu - enough to manufacture several hundred nuclear weapons. The practical significance of declaring stocks with such a large discrepancy is therefore questionable. This is a practical problem which was also experienced in the South African case. During the "completeness investigation" in South Africa by the IAEA, the existence of a discrepancy could only be accepted on the strength of other supporting data (i.e. other than nuclear materials accounting), such as operational records, electricity consumption, reports on chemical losses, etc. Considering that South Africa produced a relatively small quantity of HEU over a period of about 15 years, the practical problem of giving an accurate production figure for tens and hundreds of tons of material produced over half a century would present significant practical problems. Declaration of nuclear material in weapons or directly associated with nuclear weapons without the ability to verify the declaration which will be made, would therefore not contribute to confidence building.[56]

When considering whether to include existing stocks under the scope of a future treaty, the following major options should be considered: (a) full incorporation of stocks; (b) partial incorporation of stocks; (c) to keep open the options for a more substantive consideration in the future; (d) voluntary initiatives outside a treaty; and (e) expansion of the Trilateral Initiative. Although not addressed in these options, civilian materials, HEU for naval fuel reactors, and tritium need to be examined as well.

a) **Full incorporation of stocks**

A most extreme and unrealistic treaty would require disposition of all existing military materials. Such a treaty would virtually serve as a comprehensive nuclear disarmament treaty, whose acceptance by NWS is impossible at this stage.[57] Instead, a treaty could require that all existing stocks be subject to international safeguards, or at

least require States parties to declare all those materials. To make NWS acceptance easier, such declarations could focus on aggregate stocks and not require details on the materials, which might contain sensitive military information.[58] However, in terms of military requirements, technical difficulty, and cost implications, NWS and threshold states will still reject any attempt to include all military stockpiles.

b) **Partial incorporation of stocks**

Nuclear disarmament is a long-term process that requires a combination of unilateral, bilateral and multilateral measures. If the value of a treaty is to be judged on its own merit, a treaty that only addresses future production would be valuable enough. Thus, instead of addressing all military fissile materials, the treaty could only target those materials which NWS are more willing to deal with. A better approach might be for a FMT to include weapons material which has been transferred from military use to peaceful nuclear activities (declared as excess) as a starting point at entry into force of the FMT for a given State with nuclear weapons[59]. This excess material would be included in a starting inventory of a State upon entry into force of the FMT (without an obligation to declare its "completeness and correctness" from a production point of view) and would be subject to the verification machinery provided for in the treaty. Further material declared as excess in the future would continuously be added to the starting inventory in an irreversible way.[60] Irreversibility is the key benefit of this option; the control over fissile materials would be steadily increased, serving both disarmament and non-proliferation objectives. However, the NWS and the *de facto* nuclear weapons possessors could keep as large materials as they want by classifying them as "necessary for maintaining the stockpile."[61]

Although a cut-off treaty will have a significant nonproliferation effect to solve the question of asymmetric stocks in South Asia and the Middle East, assuming that the three nuclear weapons possessors in the regions will join the treaty, these States are unlikely to accept a treaty soon. It is important to note that none of them have signed or ratified the CTBT yet. Although regional nonproliferation is important and needs to be addressed, it should not be the major objective of a treaty.

c) **Keeping the way open for a more substantial consideration in the future**

With this option, a treaty will not address the issue of stocks immediately, but will spell out steps to be taken at a later stage for a more substantial consideration. One way is to include appropriate language in the preamble of a treaty referring to the possibility of future undertakings on stocks.[62] Such language could range from a general recognition of the importance of the stock issue to more specific undertakings. The advantage of this option is to specify and reconfirm the international community's interests in the issue. However, this option will allow the NWS and the *de facto* nuclear weapons possessors to buy time; there is no guarantee that any initiative will be actually taken, unless there is consistent and strong political pressure on those countries. If existing stocks were left completely outside a treaty, the NNWS will likely continue to aspire to a new treaty that specifically aims to reduce, and eliminate existing nuclear weapons usable stockpiles. However, given the NWS' sensitiveness to multilateral negotiations on nuclear disarmament, just agreeing on such negotiating mandate would take a long time. Therefore, a situation should be avoided where a separate treaty on stocks needs to be

negotiated on its own. A fissile material ban should at least be a starting point to deal with existing stocks in a multilateral framework. In other words, a FMT could serve as a transitional point where the NNWS can start the nuclear disarmament process, thereby making the NWS accountable to their undertakings.

d) **Voluntary initiatives outside a treaty**

If existing stocks cannot be dealt with in a treaty, the NWS and the *de facto* nuclear weapons possessors could be urged to take confidence building measures or voluntary transparency measures. Through unilateral, bilateral and multilateral initiatives, they could work on specific issues such as declarations of excess weapons materials and enhancement of physical protection of stocks. Given its voluntary nature, there is no guarantee that any measure would be actually taken. Moreover, the large amount of military direct-use materials existent in those states would remain unsafeguarded.[63]

e) **Expansion of the Trilateral Initiative**

Another possible way to reconcile the discrepancy between the NWS' perception of the FMT as a non-proliferation tool, and much of the rest of the world's perception of a disarmament oriented FMT is to separate the two goals into different, but mutually reinforcing international efforts. Such a separation can ensure that the discrepancy in perceptions will not hamper the entry into force of an FMT as has been the case with the CTBT.

Under the Trilateral Initiative (a framework agreement between the United States, the Russian Federation and the IAEA for placing excess nuclear materials from dismantled weapons under a collective monitoring system), these two NWS and the IAEA have been working on a verification regime, which would allow the IAEA to monitor excess materials removed from the two countries' nuclear arsenals. If implemented, this work can be seen as the first development of a concrete approach to international verification of nuclear disarmament.[64] A model legal framework has already been agreed and is available to be used in new verification agreements between the IAEA and the two states. However, due to unresolved disagreements over costs, materials to be covered, and a terminating point of verification, the Initiative has not been put into practice. To effectively use the Initiative as a separate, but supporting mechanism to a future FMT, the following could be considered:

(i) **Expand the Initiative to include all NWS and de facto NWS**: One of the benefits of the Initiative is that it involves the two NWS with the largest nuclear arsenals, setting an example for other NWS. Although a positive example is important, it is not enough, and all eight States with nuclear weapons will need to reach an agreement with the IAEA for their inclusion in the Initiative. Inclusion in the Initiative can begin as a voluntary arrangement and be expanded through diplomatic pressure applied by the United States and Russia.

(ii) **Incorporate an inventory of excess weapons usable material**: Excess material could be included in a starting inventory upon entry into force of each State's participation in an expanded Initiative with the IAEA. Material declared as excess in the future could continuously be added to the starting inventory in an irreversible way.

(iii) **Include legally binding agreements between the IAEA and each state**: The Model Verification Agreement is already available as a legally binding instrument which states may sign with the IAEA. IAEA verification and oversight of disposition can begin at different times for each State on the basis of the size of a state's weapons usable stocks of fissile material, beginning with the largest stocks.

(iv) **Set a timetable for the inclusion of pre-existing stocks of fissile material**: A timetable will be needed to ensure that disarmament actually takes place. It can begin with excess fissile material and gradually include additional material up to a certain point, at which time a conference may be required to assess the Initiative's progress and determine how much further to proceed.

(v) **Establish a source of funding:** Efforts will need to move forward on the establishment of the proposed Nuclear Arms Control Verification Fund in order to allow the expensive disarmament work to occur. The crucial role of the G-8 in providing funding for plutonium disposition in Russia will need to be expanded to other States as the initiative itself expands. In this regard the announcement of the G-8 Partnership Against the Spread of Weapons of Mass Destruction two years ago was a welcoming step. This initiative was further expanded at the 2004 G-8 Summit in the United States when it agreed to an "Action Plan for Nonproliferation" which includes a one-year moratorium on supplying equipment for producing fissile material to countries that do not already have it. The G-8 also announced seven new participants in its program for funding the securing of nuclear materials in the former Soviet Union and agreed to press more NNWS to accept the Additional Protocol to their IAEA safeguards agreement. Although its focus on the civilian nuclear fuel cycles in NNWS is important, the G-8 initiative could do more to secure weapons usable fissile material in states possessing nuclear weapons.

f) **Expansion of the Cooperative Threat Reduction program**

Similar to the Trilateral Initiative, the Cooperative Threat Reduction (CTR)[65] is a framework through which the United States lends financial and technical assistance to states of the Former Soviet union to dismantle, destroy, and safeguard nuclear warheads and associated fissile material. In the context of fulfilling the objectives of a FMT, an expanded CTR could provide the financial means to not only secure weapon-grade fissile material from theft or diversion, but also reduce, and destroy stocks of such material in the states in which it is implemented, thereby serving both a nonproliferation and disarmament objective.[66] The recent announcement by U.S. Secretary of Energy Spencer Abraham, of a Global Threat Reduction Initiative (GTRI) at a meeting with IAEA senior officials on 26 May is in effect an expansion of the CTR. The purpose of this initiative would be to repatriate all Russian-origin fresh high enriched uranium fuel; to take all steps necessary to accelerate and complete the repatriation of all U.S.-origin research reactor spent fuel under existing U.S. programs from locations around the world; to convert the cores of civilian research reactors that use high enriched uranium to use low enriched uranium fuel throughout the world; and to identify other nuclear and radiological materials and related equipment that are not yet covered by existing threat reduction efforts, and rapidly address the most vulnerable facilities first, to ensure that there are no gaps that would enable a terrorist to acquire these materials for malevolent purposes.

2. **Defining fissile material for nuclear weapons or other explosive devices**

A primary focus of the FMT should clearly be to stop the further production of nuclear materials (in practice certain uranium and plutonium isotopes, and perhaps certain other transuranic elements) from which nuclear weapons can be made. Using the term "fissile material" in a generic sense for these weapons materials could cause misunderstanding - in a technical sense "fissile material" has different definitions. A common understanding will have to be agreed for the use of the term. Various definitions for this term exist in the technical literature. For example, in a 1999 Technical Note of the IAEA[67], the following definition is given: "All nuclear weapons employ fission energy components. All isotopes of all elements beginning with uranium will fission when struck by a neutron, i.e., they are to some extent fissionable. The fissionability of the isotopes of a given element show marked differences (e.g., 235U is much more fissionable than 238U). Most heavy nuclei require that the incident neutron has a substantial amount of kinetic energy to induce fission, however, a few heavy nuclei will fission when the kinetic energy of the incident neutrons is essentially zero; such nuclei are said to be fissile. 233U, 235U, 239Pu and 241Pu are the most common fissile nuclides".

The term "fissile material" is also associated with materials chain-reacting with slow neutrons, i.e. materials used in power reactors. However, the term also includes weapons materials because materials which chain-react with slow neutrons also do so with fast neutrons. In using the word "fissile" in the FMT, it should be made very clear that it does not include stopping the production of "fissile material" for other than nuclear explosive uses. Without such a qualifier, a ban on production for nuclear weapons purposes could mean stopping the production of both commercial reactor fuel and weapons materials. Whereas it is accepted that it would be difficult, if not impossible, to change the name of the prospective treaty at this stage, it should be clear that "fissile material" should be defined as addressing nuclear materials that can be made to chain react for the purpose of a nuclear weapon.[68]

Given the “new” threats to the nonproliferation regime, i.e. the misuse by some States of the “inalienable right” to peaceful uses of nuclear energy and the dangers that fissile material could fall in the hands of terrorists, some critics of civilian plutonium reprocessing have proposed to ban commercial reprocessing as part of a fissile material ban, while others have suggested a more moderate approach imposing a phased- in moratorium on reprocessing and recycling plutonium.[69] In light of the emphasis placed on the proposals by Dr. ElBaradei and President Bush, it might be necessary to consider whether civilian production (and stocks) could be included under one a global instrument related to fissile material, and if so, how. However, as pointed out earlier, the large

commercial investments and interests in continuing civilian reprocessing in some countries, including several NNWS, will make the inclusion of civilian nuclear programs into the scope of a treaty politically difficult, if not impossible. In addition, those who are party to the NPT are likely to insist on the legitimacy of commercial reprocessing under Article IV of the NPT.

3. **Tritium**

Tritium is neither a fissile material nor a nuclear material. However, it is of strategic significance since it increases the yield of nuclear weapons by a factor of five to ten. Warheads can therefore be built smaller and lighter, while retaining the same yield.[70] Most, if not all, modern nuclear weapons use tritium, either to boosts the yield of an implosion (plutonium) device or to combine it with deuterium in a fusion reaction in thermonuclear weapons. Without replenishing the decaying tritium from time to time, the effective yield of some nuclear weapons would be drastically reduced.

When considering the inclusion of tritium in a future treaty, it is important to note that a ban on tritium production would not reduce the number of nuclear weapons. Moreover, a warhead without tritium is still a nuclear weapon with a significant yield.[71] While a ban on the production of tritium would starve certain nuclear weapons from an essential component, leading to the natural 'death' over time of many modern weapons containing this material, it would not eliminate all nuclear weapons. A plutonium or HEU bomb, less effective with regard to yield, can still be made without tritium. The miniaturization of nuclear devices will, however, be severely handicapped.

Although inconceivable that NWS would give up the use of tritium for warheads - since this would require new warhead designs - a case can be made in favor of tritium control as a qualitative disarmament measure.[72] Since tritium decays at a rate of more than five percent a year, a ban on its production will provide a soft time-bound framework for making nuclear arsenals much less effective. NWS might for this reason be more sensitive to tritium control than to a control on existing stocks.

For a FMT to be non-discriminatory, it should have reciprocal measures which have equivalent impact especially on the NWS and on the *de facto* nuclear weapons possessors.[73] A ban on the tritium production in the NWS will allow a balance between nonproliferation measures directed against the *de-facto* nuclear weapon possessors and disarmament measures directed against the NWS.[74] An effective tritium production ban would, however, depend on whether the disarmament process will keep pace with the decay of the existing tritium in warheads or in the military inventory.[75] The pace of the independently conducted disarmament, such as the one under the Cooperative Threat Reduction program could provide an indication of the potential impact of a tritium cut-off.

The NNWS would likely argue that efforts to include tritium in a future treaty would divert attention and efforts from the important issue of existing stocks of weapons grade HEU and plutonium, which they want to address without further delay. The need for tritium will, in practice, only disappear to the extent that nuclear disarmament undertakings reach their final objective. Given the slow pace of disarmament, a stop of supply of new tritium would mean that all nuclear arsenals become ineffective sooner or later. This could be regarded as equal to time-bound disarmament, which the NWS have

never accepted. Therefore, acceptability of a tritium production ban seems low both for the NNWS and the NWS.

4. **Other Transuranic Elements**

The IAEA has in recent years identified the proliferation potential of neptunium (Np) and americium (Am). These elements are formed at very low concentrations in nuclear fuel when irradiated in a reactor and need specially designed industrial scale facilities to separate it from unused uranium or produced Pu recovered in plants which reprocess irradiated fuel, or in plants processing the high level waste resulting from reprocessing. Present quantities of separated Np and Am are small. However, Np is suitable for making a nuclear explosive device (even a relatively simple gun-type device). There is a difference of opinion regarding the credible use of Am for such a purpose due to its physical (not nuclear) characteristics. Np should probably be included in the FMT.[76]

5. **Naval Reactors**

The continued use of weapons grade material in naval military reactors will require special consideration under any future accord dealing with fissile material. Part of the original bargain when the NPT was crafted, was to leave a number of nuclear activities in the category of "acceptable uses so as to satisfy mainly the concerns of the NNWS to maintain the widest possible option in return for giving up their right to nuclear weapons. In addition to the "inalienable right" to develop research, production and use of nuclear energy for peaceful purposes, other "allowed" uses included so-called "peaceful nuclear explosions" (PNEs) and the operation of naval propulsion reactors (NPRs) for commercial shipping.[77]

As in the case of PNEs (with the exception of India's claimed PNE in 1974), the commercial aim of NPRs were not adopted for any widespread commercial uses. The Soviet Union developed the only truly "civilian-use" NPRs to power a small fleet of nuclear icebreakers. Most other NPRs today are used to propel naval vessels (mostly submarines) from the NPT NWS. The conclusion of the CTBT eliminated the PNE loophole from the Treaty.[78] However, the other dangerous loophole that continues to exist is the possibility that what was originally intended to be a commercial loophole in the NPT regime, remains a possible source of fissile material for military or other non-peaceful purposes.

The 1972 model Comprehensive Safeguards Agreements (INFCIRC/153) allows for nuclear material to be withdrawn from safeguards for "non-proscribed military activities" meaning that it could not be used for the production of nuclear weapons or other explosive devices, but that safeguards would only apply once the material was reintroduced into peaceful nuclear activity." [79] This provision was specifically intended to be applied to nuclear material for naval nuclear reactors using HEU. While these conditions forbade the use of nuclear material removed from safeguards for weapons purposes, they did not forbid its use in a propulsion reactor for other military purposes. In practice this provision has never been applied, probably because only the NWS are assumed to have military naval reactors in operation (nuclear submarines and aircraft carriers) and they are not subject to Comprehensive Safeguards Agreements.

The need for naval reactors fuel will exist as long as naval vessels using these reactors exist. Given the increase in technological capability of states other than the NWS

further fueled by the prestige and tactical advantages of developing or acquiring especially nuclear propelled submarines, ownership of this technology will likely expand beyond the states with nuclear weapons. There are currently approximately 170 nuclear propelled vessels at see, about 150 of which are submarines (about 135 are owned by the United States or Russia with the remaining 35 in the navies of China, the United Kingdom and France)[80]. Both the United States and the United Kingdom use weapons-grade HEU as fuel, while Russia uses lower enriched uranium for its submarines and up to 90% enriched uranium for its icebreaker fleet. France uses both LEU and HEU for its existing submarines (depending on the type), but future designs will use only LEU. China's submarines are reportedly powered by LEU reactors.[81]

The possibility of converting existing HEU naval propulsion reactors to run on LEU fuel is remote, especially for submarines. Although France, and supposedly China, has developed technology to operate LEU naval reactors propulsion, other NWS, including the United States, have chosen not to go down this route. The United States and Russian have however, started to convert HEU research reactors to LEU.

Recent concerns over Brazil's refusal to accept the additional protocol and reports that Brazil refused to allow IAEA inspectors to examine an enrichment facility under construction near Rio de Janeiro[82] further highlight the loophole in the NPT safeguards system allowing the production and use of HEU for non-explosive purposes. The Brazilian Minister of the Navy attaches the highest priority to the development of naval propulsion for use in a nuclear powered submarine and has received broad political support for this project.[83] Brazil is likely to argue that the enrichment levels and the quantities and configuration of fuel in the reactors are considered of strategic military value and should therefore be kept secret, including from IAEA inspections. This could be the driving force behind Brazil hesitancy to accept safeguards covering its naval propulsion program that would be excluded under its comprehensive safeguards agreement with the IAEA. It is also not clear whether the Brazil is attempting to develop HEU or LEU propulsion for their submarine program. As in the case of the French naval reactors, Brazil may wish not divulge its technology solutions to develop LEU reactors.

Of course, it is also necessary to recall that India – not covered by the IAEA comprehensive safeguards agreement – is also trying to develop an indigenous nuclear submarine fleet and reports suggest that it might be able to do so by 2010. The Indian "Advanced Technology Vessel" project has so far experienced difficulties and while India has the capability of building the hull and developing or acquiring the necessary sensors, its submarine project has been dogged by system integration and fabrication problems.[84]

The obvious conclusion is that an allowance will have to be made in the FMT for military naval reactors - an exception which has also been available for NNWS, in principle, for more than 30 years. There is, however no common view regarding how or whether a FMT should deal with HEU for naval propulsion reactors. One argument is that such material is beyond the negotiating mandate since it is not considered as excess material. For example, at the US Navy's insistence, much of the weapon-grade HEU outside nuclear weapons has been set aside for future use in naval propulsion reactors, and has therefore not been declared excess.[85] Confidentiality of the production process of fuel for military vessels would also pose technical difficulty in verifying non-diversion of such material purposes to explosive purposes.[86]

However, if HEU for naval propulsion remains unsafeguarded, a FMT will contain an unacceptable loophole for diverting those materials to explosive purposes.[87] It would be at least necessary to place those materials under international safeguards. This would require a change in INFCIRC/153, which allows withdrawal of materials for non-explosive purposes from safeguards. Alternatively, a decision to require the additional protocol (INFCIRC/540) as the standard of compliance under the NPT should capture such material as well as facilities to enrich and process such material. Any exemption for naval reactors from INFCIRF/540 safeguards would create further loopholes since the Agency, under such an exemption, would not be able to provide the assurance of absence of undeclared nuclear material/activities - the main purpose of the additional protocol.

For an FMT to include naval propulsion reactors, it would have to make provision for the right of States to produce and employ material for non-explosive purposes. In order to ensure that such material is not diverted, appropriate verification mechanism will have to be designed recognizing the highly secretive nature of naval fuel and its production process. More desirable of course, would be a prohibition on the development of more HEU naval propulsion reactors. Given the large number of HEU naval reactors in the navies of at least four out of the five NPR NWS, it is unlikely that these States will agree to covert these reactors to LEU. Making an exception for HEU reactors already in service will create another discriminatory provision that will likely not be supported by countries such as Brazil and India.

CAN A FMT BE VERIFIED IN A CREDIBLE AND NON-DISCRIMANATORY WAY?

The Shannon mandate requires the negotiation of a "non-discriminatory, multilateral and internationally and effectively verifiable treaty." Key to the success and future credibility and relevance of a FMT would be how to ensure that it is "effectively verifiable." It should also be considered whether verification of the treaty should apply to all states, or only to states currently possessing nuclear weapons, including the three nonmembers of the NPT. It should further be considered whether the verification systems should closely resemble the current IAEA safeguards systems for NNWS, or whether a completely separate regime should be developed for NWS and NNWS respectively.

Verifying a future FMT closely relates to how to deal with sensitive parts of the nuclear fuel cycle, such as enrichment and reprocessing. The recent proposals by Dr. Elbaradei and President Bush seem to indicate that for a future treaty dealing with fissile material to be effective and credible, it should also ensure that civilian fuel cycles do not become the sources for clandestine nuclear programs, or potential fissile material "mines" for non-state actors. The IAEA has consistently argued that from a technical perspective, the application of verification arrangements to anything else that a State's entire fuel cycle could not give the same level of assurance of non-production of fissile material for nuclear weapons purposes as it is provided by the IAEA by implementing comprehensive safeguards agreements in NNWS. The inclusion of the civilian fuel cycle under a FMT verification regime would, however, not be acceptable to several states and will likely derail any progress towards agreement on a future treaty. It is therefore not suggested that a FMT verification system include additional measures (in addition to the existing IAEA safeguards) to cover civilian fuel cycles.

Components of a verification system

The verification system of a future FMT should focus only on fissile material for nuclear weapons material and other nuclear explosive devices and should comprise of (a) a component to deal with facilities which had previously produced fissile material for nuclear explosive purposes; (b) a component suitably adapted to weapons grade materials, declared as excess and placed under the supervision of the verification organization (preferably the IAEA) while this material is still in a sensitive geometrical and compositional form; and (c) a component, which will be similar to or the same as IAEA safeguards, to deal with materials once they have been re-worked into non-sensitive forms and for the production of materials for non-proscribed military uses allowed by the Treaty. While declarations of historical production could be seen as a political gesture of goodwill, the practical difficulties regarding completeness will need to be acknowledged. Finally, the production of tritium in civil power reactors for use in nuclear explosive devices and the production of nuclear material for naval reactors will require special consideration in FMT verification system. [88]

Declarations

A verification system under a FMT should have as a basic requirement, declarations within a specific timeframe of all material covered under the treaty upon its entry into force. The type of material, including whether it was produced in the past, will of course be subject to negotiation. These declarations will, as in the case with IAEA safeguards declarations, trigger inspections of facilities related to the production, and if appropriate, storage of material covered under the treaty. To close the potential loophole of using naval propulsion reactors as sources for weapons or other explosive devices, the treaty - while recognizing the right of states to produce and employ fissile material for non-explosive military applications - should require some form of declaration of existing stocks as well as future production. Given the highly secretive nature of naval fuels, appropriate verification arrangements would be required.[89]

Verification agreements

Verification of each State party's obligations under the FMT should be based on a set of legally binding agreements between the State and the organization (such as the IAEA) tasked to verify adherence to the treaty. There are two alternatives for verification agreements: (i) establishing new agreements that would create another discriminatory condition for States possession nuclear weapons; or (ii) using the identical agreements for all States, but modifying or suspending some provisions to reflect the restrictions required in States with nuclear weapon programs as well as reflecting that the scope of verification under the treaty would be limited to fissile material subject to the treaty rather than all nuclear material. As a bare minimum, each State party should be required to adhere to a safeguards agreement with the IAEA incorporating all the provisions of INFCIRC/153, together with all provisions of the Additional Protocol (INFCIRC/540). A complimentary verification agreement specific to the treaty could set out obligations and responsibilities of each States and the IAEA for the exclusive purpose of verifying the fulfillment of its obligations under the Treaty. In order to address concerns over the discriminatory division between two types of agreements, a possible option would be for

the treaty to provide a mechanism by which a Conference of State Parties should take steps to bring about convergence over time with the goal to remove the suspensions allowed for States with nuclear weapons.[90]

Non-compliance

Given that a FMT would be related to the potential use of nuclear weapons, any concerns over non-compliance would have to be met in a timeframe consistent with the threat. Unlike in the case of the NPT, where the IAEA Board of Governors and ultimately the UN Security Council, are required to act on concerns over non-compliance, a more relevant and effective approach under a FMT would be to provide for a Conference of State parties to be convened promptly in a case of possible non-compliance. Such a Conference would offer opportunities to present the allegations and the response of the suspected State party (or parties) for which non-compliance is raised.[91] The Conference should have plenipotentiary powers to decide whether to refer the allegations to the UN Security Council or to take other measures, such as appointing a special panel or judiciary to determine the merit of the allegations and the remedies to be effected, and to report back to the States parties though the IAEA Director-General.

Cost of verification

Although the IAEA has the potential to take-up the responsibility for verification of FMT undertakings, certain proliferation and resource constraints will have to be addressed. Verification of the FMT will in practice have a significant impact only on those few States that produce or possess nuclear weapons and/or weapons-grade materials. The cost of verification by the IAEA could mean a two to three fold increase in the IAEA's Safeguards budget because of the extended nuclear activities of these States. This will create its own problems amongst the Member States of the IAEA. Creating a new verification organization may be even more costly. In this regard it should be considered whether the additional cost burden should be covered by only those states that produce fissile material for weapons purposes, or by all State parties based on the UN scale of assessments.

Given the large quantities of new material and number of additional facilities to be covered it is unavoidable that the costs of IAEA safeguards implementation will have to be fundamentally reviewed. This can be done through legal rights that the IAEA always had but never exercised; new rights acquired by the Agency in terms of the Additional Protocol; and the use of new technological advances. The adoption of the Integrated Safeguards System under the umbrella of Strengthened Safeguards already provides for the reduction of traditional safeguards verification activities under certain conditions. This could be even further developed in view of the possible additional burden of the FMT, the main focus being on the verification of nuclear materials which are of real proliferation concern.

Another related problem is the unavailability of adequately trained and experienced inspectors. This could create serious problems if the number of IAEA inspectors has to be doubled in the short term. To overcome these problems, the IAEA could be contracted for its verification service which would also avoid the traditional problem of linkage between the Safeguards and Technical Cooperation budgets in the IAEA. It should, however, be realized that to effectively implement a FMT verification

system will require more inspectors than currently employed by the IAEA and could take several years to be established.

CONCLUSION

In light of the increase of both vertical and horizontal nuclear weapon proliferation, as well as the new threat of nuclear terrorism, the original mandate for negotiating a fissile material ban treaty may need to be revised in order for it to remain relevant in today's circumstances. If measured against the goals set out for the treaty, it should be considered whether a FMT is still a priority. If it continues to be considered a priority, as it should be, then it should be considered whether the treaty should seek merely to regulate the production, sale, use, and transportation of weapons-usable nuclear material, or should it aim at closing this path permanently to nuclear armament, nuclear proliferation, and nuclear terrorism?

For a FMT to be effective and credible it must be both a disarmament and nonproliferation tool, verifiably halting further production and bringing transparency and accountability to the vast stockpiles of weapons usable material located around the world. A relevant FMT should therefore be part of the nuclear disarmament process, prevent a future nuclear arms race and facilitate further steps to this end. It should also reinforce NNWS commitments under the NPT by preserving the integrity and durability of the nuclear non-proliferation regime. In so doing it should reduce risks of proliferation & nuclear terrorism while respecting states' right to use, and trade in nuclear energy for peaceful purposes.

In addition to a ban on further production of nuclear materials for nuclear weapons, a relevant FMT could act as a receptacle for excess weapons material and associated closed-down/decommissioned facilities, in transition from military explosive use to peaceful use, to ensure the irreversibility of the transition. As such, it should require that declared excess nuclear weapons material be included in a starting inventory of a State upon entry into force of the FMT. Viewed from this perspective, a FMT should (a) capture in an irreversible way weapons material declared as excess in an ongoing process; (b) prevent altogether or regulate the further production of weapons-grade materials for legitimate (non-proscribed) uses such as fuel for research reactors, naval reactors, etc; and (c) make "closed-down/decommissioned" production and associated facilities subject to verification to prevent their re-use for weapons purposes.

Proposals to establish multinational nuclear fuel-cycle facilities and perhaps to cap the development of national fuel cycles to countries that currently posses such abilities have been considered for many years and remain, at best, a longer-term option – and, of course, is regulatory in orientation. Many of the most serious problems of stockpiling and transporting fissile materials, of guaranteeing against losses of very small quantities of material, and of protecting against technology transfers would not be addressed. Although the ElBaradei and Bush proposals are relevant to the threat presented by both the production as well as stockpiling of fissile material production, their primary focus is on material for civilian nuclear reactors and other peaceful purposes. Since the Bush proposal would in fact introduce a "new deal" with added restrictions on NNWS without reciprocal obligations on the NWS, any linkage between

this proposal and the objectives of a FMT could complicate the negotiating process to the detriment of a global FMT.

However, if set against the backdrop of the new threats, internationally controlled civilian fissile material stockpiles would not only strengthen the role of the IAEA, but it would also greatly restrict the potential of these dangerous materials falling into the hands of non-state actors, or NNWS looking to renege on their treaty obligations. Such a system will only be effective, and politically acceptable if all States should also implement their nuclear nonproliferation and disarmament commitments, and work cooperatively on the development of proliferation resistant technologies to use the atom for peaceful purposes.

While a FMT negotiated along traditional lines of treaties such as the CTBT would be the most desirable option, this is not the only option available to address the issue in a sustainable and effective way. Pragmatism and flexibility would suggest that a FMT could in the first instance, be drafted by the eight states with nuclear weapons. In this regard, the existing Trilateral Initiative supported by the G-8 Global Partnership against the spread of weapons and materials of mass destruction could provide a useful framework. However any such "pre-negotiations" must be done in consultation with other NNWS.

The idea of a FMT is not new. It has been a longstanding goal of the international community, in particular the United States. The deadlock in the CD resulted in many initiatives in and around the CD to promote the various objectives of a FMT. The positions of delegations are well known and sufficient resource material is available to start serious negotiations on a future FMT. All possible options for a FMT have been analyzed by experts and several versions of a draft FMT are widely available.[92] What is lacking is the political will by a few states. These states seem to believe that their interest would be at such risk if negotiations are started in the CD (or elsewhere), that those interests cannot be guarded by the consensus rule that traditionally govern multilateral negotiations of this nature. Although differences remain over the scope of the treaty and its effectiveness, as well as over linkages to negotiate other treaties in the realm of arms control and disarmament, the problem is not one of semantics, but of higher political nature. This would require a careful reflection at the highest political level by all CD members, in particular those states who continue to have reservations about the A-5 proposal, on whether a FMT continues to be a high priority.

To this end, it is encouraging that U.S. Presidential candidate Senator John Kerry recently highlighted a FMT as part of a number of steps that the United States, under his administration, would take to meet the new proliferation challenges[93]. In this regard he stated that "America must lead an international coalition to halt, and then verifiably ban, all production of highly enriched uranium and plutonium for use in nuclear weapons – permanently capping the world's nuclear weapons stockpiles" and he added that the current (Bush) administration is "stalling, and endlessly reviewing the need for such a policy." He also emphasized the need to "reduce excess stocks of materials and weapons" and that his administration will stop the development of "a whole new generation of bunker busting nuclear bombs." Senator Kerry's remarks seem to indicate a more pro-active approach, reflecting the arms control goals envisaged when the concept of a FMT was introduced in the General Assembly in 1993.

If a FMT is to remain relevant for the majority of states, the long-aspired goal to limit not only the production of nuclear weapons usable fissile material, but also existing stockpiles will have to be addressed. Given the growing risks of nuclear terrorism, and the potential threats posed by radiological weapons, a related question that should be addressed is whether the world would be better off with no production of separated plutonium or highly-enriched uranium – and the progressive elimination of existing stockpiles – or with regulated, limitless production of such materials by some States today, and more States tomorrow. What remains clear, however, is that only collective, multilateral efforts, based on a verifiable legal instrument, would strengthen the global norm against the acquisition or possession of nuclear weapons, and would ensure that fissile materials do not end up in the hands of terrorists.

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[92] A particularly interesting article entitled "The Fissile Material Cut-Off Treaty: A Venue for Future progress in Arms Control, Non-Proliferation and the Prevention of Nuclear Terrorism", by Mr. Tom Shea from the IAEA also contains the text of a draft treaty
[93] Remarks by Senator John Kerry on New Strategies to Meet New Threats, June 1, 2004, West Palm Beach, Florida http://www.johnkerry.com/pressroom/speeches/spc_2004_0601.html

List of published studies and papers
All papers and studies are available as pdf-files at the Commission's website: www.wmdcommission.org

No 1 "Review of Recent Literature on WMD Arms Control, Disarmament and Non-Proliferation" by Stockholm International Peace Research Institute

No 2 "Improvised Nuclear Devices and Nuclear Terrorism" by Charles D. Ferguson and William C. Potter

No 3 "The Nuclear Landscape in 2004: Past Present and Future" by John Simpson

No 4 "Reviving the Non-Proliferation Regime" by Jonathan Dean

No 5 "Article IV of the NPT: Background, Problems, Some Prospects" by Lawrence Scheinman

No 6 "Nuclear-Weapon-Free Zones: Still a Useful Disarmament and Non-Proliferation Tool?" by Scott Parrish and Jean du Preez

No 7 "Making the Non-Proliferation Regime Universal" by Sverre Lodgaard

No 8 "Practical Measures to Reduce the Risks Presented By Non-Strategic Nuclear Weapons" by William C. Potter and Nikolai Sokov

No 9 "The Future of a Treaty Banning Fissile Material for Weapons Purposes: Is It Still Relevant?" by Jean du Preez

No 10 "A Global Assessment of Nuclear Proliferation Threats" by Joseph Cirincione

No 11 "Assessing Proposals on the International Nuclear Fuel Cycle" by Jon B. Wolfsthal

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