**CONFERENCE ON DISARMAMENT**

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**LETTER DATED 12 MAY 2003 FROM THE PERMANENT REPRESENTATIVE OF THE NETHERLANDS TO THE CONFERENCE ON DISARMAMENT ADDRESSED TO THE SECRETARY-GENERAL OF THE CONFERENCE ON DISARMAMENT TRANSMITTING A SUMMARY OF THE FOURTH OPEN-ENDED INFORMAL MEETING IN THE FRAMEWORK OF THE NETHERLANDS' FMCT-EXERCISE, ON A TREATY BANNING THE PRODUCTION OF FISSILE MATERIAL FOR NUCLEAR WEAPONS AND OTHER NUCLEAR EXPLOSIVE DEVICES, HELD IN GENEVA ON 4 APRIL 2003**

I have the honor to forward to you a summary of the fourth open-ended informal meeting in the framework of the Netherlands' FMCT-Exercise on the issue of banning the production of fissile material for nuclear weapons and other nuclear explosive devices (FMCT). This meeting was organized on Friday April 4, 2003 by the delegation of the Kingdom of the Netherlands to the Conference on Disarmament.

The topic of this fourth meeting was the issue of stockpiles of fissile material for nuclear weapon purposes. At this meeting Ambassador Pablo Macedo, Deputy Permanent Representative of Mexico to the Conference on Disarmament, and Mr. Morten Bremer Maerli, Senior Researcher at the Norwegian Institute of International Affairs, gave introductions on this issue.

The total number of participants in this meeting was well over 100. Over 45 countries attended this meeting as well as representatives from 4 international organizations and 2 NGO's.

I would be grateful, if you could issue this letter as well as the attachment to this letter as an official document of the Conference on Disarmament, and distribute it to all Member States of the Conference and non-member States participating in its work.

***Scope of the treaty***

Bremer Maerli outlined that there are basically 4 different scope-variants regarding stocks of fissile material:

1. Full incorporation of stocks into the FMCT;
2. Partial stock incorporation into the FMCT;
3. Normative stock guidance within the FMCT;
4. Exclusion of stocks under an FMCT.

For each of these scope-variants Bremer Maerli outlined the advantages and disadvantages (see his presentation in attachement).

Some participants argued that stocks need to be part of the scope of a non-discriminatory, multilateral and internationally and effectively verifiable treaty banning the production of fissile material for nuclear weapons and other nuclear explosive devices (FMCT). Otherwise, the FMCT would remain a non-proliferation instrument and would not address nuclear disarmament. In this respect it was argued that the issue of stocks arises mainly because it is felt that the issue of nuclear disarmament is not seriously addressed by the nuclear weapon states.

Other participants argued that an FMCT, even without stocks, would still be an important step since it would put a quantitative ceiling on the amount of fissile material. Next to the CTBT that puts a qualitative cap on the development of nuclear weapons by prohibiting testing, the FMCT will put a quantitative ceiling on the production of fissile material.

It was recognized that the mandate for the FMCT-negotiations (the Shannon-mandate as contained in document CD/1299) is ambiguously formulated. It was generally recognized that the issue of stocks should not be a pre-condition for the negotiations.

***Definition of stocks of fissile material for nuclear weapon purposes***
Apart from the scope of the treaty, the term "stocks" needs to be defined. Some participants noted that the term "stocks" at present in the discussion is used in a general way, leaving it unclear what is actually meant with the term.

Bremer Maerli outlined 8 different categories of stocks,in his presentation (see attachement):

1. Military direct use material in operational nuclear weapons and "pipelines";
2. Military direct use material held in reserve for military purposes;
3. Military direct use material withdrawn from dismantled weapons;
4. Military direct use material considered excess and designated for transfer into civilian use;
5. Military direct use material considered excess and declared for transfer into civilian use;
6. Military direct use material destined for or in naval nuclear reactors;
7. Direct use material currently in reactors or "pipelines" and storages;
8. Irradiated Highly Enriched Uranium (HEU) and Plutonium (Pu) in spent fuel from reactors, or in vitrified form for final disposal.

***Actions undertaken by the nuclear weapon states as regards stocks of fissile material for nuclear weapon purposes***
It was noted that at present some nuclear weapon states have already declared part of their stock as excess. Two of the five nuclear weapon states have put their excess stocks under EURATOM-safeguards. Other nuclear weapon states have already shut down some or all their fissile material production facilities. The United States and the Russian Federation have declared 34 $m^3$ weapon grade plutonium and 540 $m^3$ weapon grade uranium as excess stock and are in the process of down blending this excess stock. Furthermore the Trilateral Initiative of the Russian Federation, the United States and the International Atomic Energy Agency (IAEA), aims to develop a new IAEA-verification system for weapon-origin material designated as released from defense programs of both countries. IAEA-verification under the Trilateral Initiative is intended to promote international confidence that fissile material made subject by either of the two states to IAEA-verification remains irreversibly removed from nuclear weapon programs. The first phase of the Trilateral Initiative was completed by September 2002.

***Physical protection, safety and disposition of stocks of fissile material for nuclear weapon purposes***

Apart from an FMCT, some other conventions deal with aspects of fissile material, which could be relevant for future FMCT-negotiations. In the discussion were mentioned the Convention on the Physical Protection of Nuclear Material (CPPNM), the Convention on Nuclear Safety, as well as the Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management.

Yours Sincerely,

(*Signed*): Chris C. Sanders
Ambassador
Permanent Representative of the Netherlands
to the Conference on Disarmament

Annex

Forth informal and open-ended meeting of the FMCT-Exercise of the Netherlands . Conference on Disarmament, Geneva, 04.04.2003.

# A Fissile Material Cut-Off Treaty: Considerations on "Stocks"

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## Outline

- The Importance of a Fissile Material Cut-Off Treaty (FMCT)
- The purpose and scope of an FMCT
- FMCT target states
- Defining "stocks"
- Some variations on FMCT "scopes"
- Stockpile control mechanisms and principles
- Summing up

- Further reading

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## The importance of an FMCT

- Capping the number of warheads possible to produce. -› effective nuclear disarmament
- Excessive stockpiles, definitive risk of fissile materials in wrong (terrorist/state) hands. -› non-proliferation
- Accountability in all nuclear weapon states
- Together with a CTBT, the single most important mechanism for building a control regime for states outside the NPT (states what will remain outside!)

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## The importance of an FMCT (cont.)

- Next natural step on multinational arms control agenda
- Only item in the list of 13 steps from the 2000 RevCon given a timeframe for completion, signalling the importance attached to the treaty by the NPT-states.
- Failure to implement an FMCT will inevitably harm the NPT in the longer-run.
- Just a reminder - without the NPT:
  - No legal nuclear obstacles to states
  - Military intervention, incl. pre-emptive strikes, most prominent alternative?

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## The purpose and scope of a Fissile Material Cut-Off Treaty (FMCT)

- Set out in by two international decisions, both adopted by consensus:
  - a 1993 UN General Assembly (UNGA) resolution (48/75L)
  - a 1995 decision by the CD to adopt what is known as the 'Shannon mandate' (CD/1299)

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- Both decisions call for the negotiation of

"a non-discriminatory, multilateral and internationally effectively verifiable treaty banning the production of fissile material for nuclear weapons and other nuclear explosive devices".

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Mandate fairly clear on *verification* objectives

- However, the Shannon mandate does not specify options for the *scope* of the treaty.
- What to be covered by the treaty:
  - left for future discussions....

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Main dispute:

- Should an FMCT deal with existing unsafeguarded stocks (disarmament & non-proliferation) ?
- ... Or solely with future production (primarily non-proliferation, but re-enforcing nuclear status quo) ?

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## FMCT target states

- Will affect states differently :
  - variance in nuclear fuel cycles
  - inventories of fissile material
- Non-nuclear weapon states under the NPT with comprehensive safeguards agreement :
  - De facto FMCT compliant

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- Target states: states without comprehensive safeguards agreements, primarily:
  - Nuclear weapon states under the NPT
  - Nuclear weapon states outside the NPT
  - (Any breakout states)

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## Scope of an FMCT: Stocks

- Center of concern: *Direct use material*:
  - Material that can be used for nuclear warheads without any further enrichment or reprocessing
- Includes: Highly enriched uranium and plutonium

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- Plutonium containing less than 80% Pu-238,
  - Weapons-grade
  - Reactor-grade (crude nukes)
  - Unirradiated MOX
- Highly enriched uranium
  - > 20% U-235 (but no ban on naval fuel?!)
- U-233
  - Irradiating thorium (Th-232) in reactors

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## Other (IAEA) categories

- "Special fissionable material"
- "Nuclear material"
- "Alternative nuclear material"
- (Tritium)



## Special fissionable material

- A broader category of material, containing *any* fissile isotopes
  - Includes *direct use material*, natural uranium (contains 0.7% U-235), LEU, irradiated HEU and spent fuel.
  - IAEA definition: "Pu-239, U-233, and uranium enriched in the isotopes U-233 and U-235, or any material containing one or more of the foregoing".



## Nuclear material

- Even broader category of material:
  - In addition to *special fissionable material*, this category also contains so-called *source materials*;
  - Materials that contain U-238 from which plutonium is bred when irradiated in a nuclear reactor.



## Alternative nuclear material

- Material that is capable of undergoing fission
  - *Neptunium-237* and *americium* can be used for a nuclear explosion device.
  - *Curium*: potential nuclear weapon ingredient, although its use entails more severe radiological safety hazards.
  - At least one of the nuclear weapon states has successfully demonstrated a nuclear test explosion with an "alternative nuclear material"
- The separated stocks of all three isotopes are increasing worldwide, representing additional proliferation risks and safeguards challenges.



## Tritium

- Not a fissile material, but may undergo fusion. Used in modern warheads.
  - Tritium boosts the chain reaction by releasing fast neutrons in a fusion reaction with deuterium.
  - As a result, a larger fraction of the nuclear material is fissioned and more energy is released.
- Tritium has a short half-life (12.3 years) . Regular replacement needed to maintain optimal yields.
- The United Stated has restarted its tritium production
- FMCT prohibition ??



## Categories of HEU and plutonium (Based on Schaper, 1997)

1. Military direct use material in operational nuclear weapons and "pipelines"
2. Military direct use material held in reserve for military purposes
3. Military direct use material withdrawn from dismantled weapons
4. Military direct use material considered excess and designated for transfer into civilian use

5. Military direct use material considered excess and declared for transfer into civilian use
6. Military direct use material destined for or in naval nuclear reactors.
7. Direct use material currently in reactors or "pipelines" and storages
8. Irradiated HEU and Pu in spent fuel from reactors, or in vitrified form for final disposal.

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## Some variations of different FMCT scopes (based on Walker, Berkout, 1999)

1. Full incorporation of stocks into the FMCT
2. Partial stock incorporation into the FMCT
3. Normative stock guidance within the FMCT
4. Exclusion of stocks under an FMCT

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## 1) Full incorporation of stocks into the FMCT

- Comprehensive control, past and future production
- A set of states' stock obligations would have to be defined, with procedural/verification issues

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## Full incorporation of stocks into the FMCT

- Pros:
  - Meet both disarmament and non-proliferation (NPT) goals
  - FMCT an integral step of nuclear disarmament
  - Accountability and transparency in all states
  - Global and regional security benefits likely
- Cons:
  - Costs, implementation
  - Huge NWS opposition (all NWS)
  - A non-starter ??!

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## 2) Partial stock incorporation

- Focus on future production
- Some stockpile issues would be addressed, e.g.
  - safeguarding of excess material
  - commitment not to withdraw material from safeguards

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## Partial stock incorporation

- Pros:
  - One-way reduction of military stocks
  - Possible NWS interest
  - Flexibility, allowing *some* unsafeguarded stocks : Easier to attract NWS outside the NPT ?
- Cons:
  - (Large) stocks unaccounted/unsafeguarded
  - Only limited non-proliferation benefits (transfers)
  - Only limited disarmament benefits

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### 3) Normative stock guidance within the FMCT

- Focus on future production
- The treaty *includes* reference to concerns about the stocks, expressing expectations that steps will be taken to address them:
  - Use preambular language
  - Articles enshrining stockpile principles and objectives
  - Outline important next steps
  - Periodic reviews of progress made in implementation

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### Normative stock guidance within the FMCT

- Pros:
  - *Probable* one-way reduction of military stocks
  - NWS interest likely
  - Flexibility – get NWS outside the NPT onboard ?
- Cons:
  - Fewer constrains, less control of NWS stock policies
  - Even less non-proliferation benefits (transfers)?
  - Even less disarmament benefits?

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### 4) Exclusion of stocks under an FMCT

- Focus on future production
- Stocks will not be addressed under the auspices of the treaty, but the treaty may include guiding principles
- Stocks excluded: Primarily non-proliferation

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### Exclusion of stocks under an FMCT

- Special efforts would be taken (outside the treaty) to hasten progress on specific issues (e.g. physical protection, excess declarations, disposition), through unilateral, bilateral and multilateral initiatives.
- A set of principles would be established to guide states' stocks policies (e.g. irreversibility, minimization, transparency, protection and review)

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### Exclusion of stocks under an FMCT

- Pros:
  - Broad NWS acceptance
  - Some control on NWS-outside NPT
  - Some support for the NPT-process
  - Limited costs and implementation

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### Exclusion of stocks under an FMCT

- Cons:
  - Reservoir of direct-useable material outside international control/safeguards
  - Limited transparency, accountability
  - No real limitation on number of nuclear warheads to be produced
  - Non-proliferation limitations: Transfers from NWS cannot be controlled.
  - Lost disarmament opportunity. Long-term impact on NPT?

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## International stockpile control mechanisms

- Safeguards
  - Comprehensive (INFCIRC/153), Additional protocol (INFCIRC/540), Voluntary offer agreements (VOAs)
- Convention on the Physical Protection of Nuclear Material (INFCIRC/274)
  - Amendment (weak) under way
- Trilateral: US, Russia, IAEA
  - Safeguarding excess material
- Bilateral (US-Russian) disposition agreements
  - HEU deal, plutonium disposition agreement

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## Stockpile control principles

- Minimisation of stocks:
  - End accumulation of unsafeguarded materials
  - Define military requirements/excess stocks
- Irreversibility:
  - Extend IAEA verification of non-military material
  - Extend HEU and Pu disposition (states/quantities)
  - Self-auditing and transparency ((multilat.) declarations)
- Effective protection:
  - Extend and strengthen physical protection standards
- Review:
  - Multinational, formalized review process for stocks (reductions)

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## Summing up

- FMCT important next step in multinational arms control
- FMCT still on the agenda of leading nations
- But strong political, practical and financial constraints
  - Different schemes – different benefits!
  - Failure to implement an FMCT will harm the NPT
- Pragmatism needed !
  - Current political climate
  - Urgency of the task

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## Summing up – pragmatic approach:

- Primary concern: Direct-useable material
- Full incorporation of stocks into the FMCT : obvious and important ideal, but *unrealistic*
- Best *compromise*: Focus on future production, but
  - With partial stock (declared excess) incorporation (2)
  - With expressed expectations about other stocks (3)
  - With a set of principles for states' stocks policies (4)
  - ... and a strong peer-review process – with sanctions

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## Some words of wisdom...

"for both practical and political reasons, the regulatory situation in all countries, including the NWS, should be approached as if the world is preparing for total nuclear disarmament - whether or not that is a desirable or realistic prospect"

(Albright, Berkout, Walker, 1996, p. 456)

-› An FMCT is key...!

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## Further reading:


- Kerstin Hoffman (ed), "Fissile Materials: Scope, Stocks and Verification." Disarmament Forum, UNIDIR, Two. 1999
- Annette Schaper "A Treaty on the Cutoff of Fissile Material for Nuclear Weapons - What to cover? How to verify?", Peace Research Institute Frankfurt, Report no. 48, ;uly 1997
- William Walker and Frans Berkhout, "Fissile Material Stocks: Characteristics, Measures and Policy Options", UNIDIR 99/8, 1999
- David Albright, Lauren Barbour; Corey Gay, Todd Lowery, "Ending the Production of Fissile Material for Nuclear Weapons: Background Information and Key Questions", The Institute for Science and International Security (ISIS) www.isis-online.org/publications/fmct/primer/tableofcontents.html
- Oxford Research Group: "The FMCT Handbook", February 2003
- Morten Bremer Maerli, "A Pragmatic Approach for Negotiating a Fissile Material Cut-Off Treaty", International Negotiation, Volume 6, Number 1, July, (2001). http://internegorg/in/volumes/6/1/abstracts.html


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