Conference on Disarmament

2 September 2011

Original: English

Note verbale dated 30 August 2011 from the Permanent Mission of Japan to the Conference on Disarmament addressed to the Secretary-General of the Conference transmitting the report of Mr. Akio Suda, Ambassador of Japan to the Conference on Disarmament and Chair of the "Japan-Australia Experts Side Event on FMCT Verification" held at the Palais des Nations on 30 May and 1 June 2011

The Delegation of Japan to the Conference on Disarmament presents its compliments to the Secretary-General of the Conference on Disarmament, and has the honour to transmit the attached report, entitled "Japan-Australia Experts Side Event on FMCT Verification, Palais des Nations, Geneva, 30 May - 1 June 2011, Report of the Chair, Ambassador Akio Suda of Japan".

The Japan-Australia Experts Side Event on FMCT Verification addressed the issue of how a future treaty banning the production of fissile material for nuclear weapons or other nuclear explosive devices might be verified, with a focus on fissile materials, production facilities and other verification related matters. This is an issue of relevance to the Conference's agenda item 1 "Cessation of the nuclear arms race and nuclear disarmament" and its agenda item 2 "Prevention of nuclear war, including all related matters".

The Delegation of Japan to the Conference on Disarmament would be grateful if this report could be issued as an official document of the Conference on Disarmament and distributed to all Member States to the Conference, as well as Observer States participating in the Conference.

The Delegation of Japan to the Conference on Disarmament would be also grateful if the submission of the report be duly reflected in the Report of the Conference on Disarmament to the General Assembly of the United Nations.

Japan-Australia Experts Side Event on FMCT Verification Palais des Nations, Geneva, 30 May-1 June 2011

Report of the Chair, Ambassador Akio Suda of Japan

I. Introduction

About the event

1. On 30 May-1 June 2011, Japan and Australia co-hosted a three-day "Experts Side Event on FMCT Verification" in the Palais des Nations, Geneva. The event was chaired by Ambassador Akio Suda of Japan, assisted by Mr Bruno Pellaud, Doctor, of Switzerland as Discussion Facilitator.

2. Representatives of around 40 member states of the Conference on Disarmament (CD) and around five observer states attended the event, as did representatives of the United Nations Office for Disarmament Affairs (UNODA), the International Atomic Energy Agency (IAEA) and the United Nations Institute for Disarmament Research (UNIDIR).

3. The topic of this event was possible verification mechanisms to be included in a treaty banning the production of fissile material for nuclear weapons or other nuclear explosive devices, commonly known as the Fissile Material Cut-Off Treaty (FMCT).

4. Following the Australia-Japan Experts Side Events on FMCT Definitions and FMCT Verification, held in Geneva 14-16 February and 21-23 March 2011 respectively (see CD/1906 of 14 March 2011 and CD/1909 of 27 May 2011), the purpose of this event was first to build confidence about FMCT and momentum towards FMCT negotiations in the CD on the basis of CD/1299 of 24 March 1995 and the mandate contained therein. Its purpose more broadly was to inform and support the work of the CD and to build confidence among its member and observer states.

5. This event did not represent a negotiation, nor a pre-negotiation, but an opportunity to exchange views. During this event, no agreements were sought and no decisions were taken. Views expressed during this event were without prejudice to national negotiating positions when FMCT negotiations in the CD begin.

6. The event consisted of three sessions and covered four themes: recap of the previous side events meetings, verification of "fissile materials" and "production facilities", other verification-related matters and wrap-up. The numerous experts who participated made valuable contributions to this event. The Chair thanks, in particular, Mr. Eric Pujol of the IAEA from Vienna for his valuable inputs.

About this report

7. As with the reports of the Australia-Japan Experts Side Events on FMCT Definitions and FMCT Verification contained respectively in CD/1906 of 14 March 2011 and CD/1909 of 27 May 2011, this report represents the Chair's personal summary of the discussions held during the event. It is not an exhaustive treatment of the topic of FMCT verification and it draws no conclusions about the merits of the options put forward. The purpose of this report is not to predetermine the conduct of future FMCT negotiations in the CD, but to inform and support the work of the CD and to stimulate further substantive exchanges in the CD on issues related to an FMCT.

II. Theme 1: Recap of the previous side event meetings

8. The first theme provided the opportunity for participants to recap previous side events, in particular on the relationship between various definitions and the purpose of verification under an FMCT. The previous side events had allowed participants to consider the issue broadly and to reflect on FMCT verification in the context of the experiences of the IAEA and Organisation for the Prohibition of Chemical Weapons (OPCW).

Relationship between various definitions and verification

9. The Chair began discussions by summarizing the debates of previous side events on the potential relationship and linkages between various definitions and verification. The Chair stated that while some had argued that definitions should be as broad as possible in order to prevent any loopholes, others had contended that verification would be too costly and cumbersome if definitions were too broad. However, there had been an alternative view that there was no immediate linkage between fissile material definitions and verification. A definition concerning prohibitions could be set in one way, while a range of material categories under verification could be established depending on the strategic value of materials and the level of verification intensity. Some participants expressed a strong preference to focus on unirradiated direct use material, namely highly enriched uranium [HEU] and Plutonium, and that a verification regime would flow logically from that, i.e. enrichment and reprocessing plants and associated downstream facilities (for instance, fuel fabrication facilities). Plus a challenge inspection protocol to detect undeclared facilities.

10. Some participants noted that the *range of activities* to be banned and the *range of verification* could differ, thereby allowing separate considerations of these two categories of issues. Some expressed the view that a relationship between various definitions and verification certainly existed, but that the two did not have to be identical, and that cost-effectiveness must be considered in determining the latter.

Purpose of FMCT verification

11. Some participants spoke on the purpose of FMCT verification and cited four general verification objectives. The first was to verify that production of fissile material was as declared; the second was to verify the non-diversion of existing fissile material, including that in civil use; the third was to verify the absence of undeclared production; and the fourth was to verify the conversion and dismantlement of production facilities formerly used for nuclear weapons purposes. Some argued that the fuel cycle for naval propulsion should also be taken into account and that some aspects of fuel, like design, must be protected.

III. Theme 2: Verification of “fissile material” and “production facilities”

12. This theme was divided into two sub-themes of verification of “fissile material” and verification of “production facilities”, which followed the basic format of the first side event on the definitions of fissile material and production facilities. Firstly, existing verification measures were briefly reviewed, which was also an aim of the second side event. It was then asked whether the existing measures are relevant to and could be applied to the verification of an FMCT, and if so, how could this be achieved. It was also asked if there could be any specific factors to be additionally considered for verifying fissile materials and production facilities, and if so, what could these factors be and what kind of verification measures could or should be employed.

Verification of fissile material

13. The Discussion Facilitator, Mr. Pellaud, Doctor, gave his own views on this topic under the heading “Tools for Fissile Material Verification.” Borrowing slides from the

IAEA presentation to the second side event, he adjusted them to go from an IAEA's context to an FMCT context.

(a) Purpose: The purpose is to provide assurance about the peaceful use of fissile material subject to the treaty. In essence, the objective of an FMCT is not the timely detection of *diversion*, but the timely detection of the *production* of significant *quantities* of fissile material, as well as the verification of the correctness and completeness of state declarations under an FMCT.

(b) Inspection goals: Violations should be detected with an appropriate timeliness factor. There should be a risk of detection using tools which are quantitative goals at the IAEA. The timeliness component of inspection goals for the IAEA is the conversion time of particular materials for explosive devices. But in an FMCT, the issue is not the conversion of materials to weapons, but the misuse of materials and of production facilities. In this case, conversion time refers to the time it takes to convert production facilities (not fissile materials) deemed to be for civil use toward the production of fissile material for nuclear weapons. *The focus is production.* For enrichment, going from low enriched uranium (LEU) to HEU would take about one week; for reprocessing about a month.

(c) Detection time: This refers to the maximum time that may elapse between misuse and its detection by inspectors. What is the maximum time to catch illicit activities? This time period may be one month for an enrichment plant and three months for a reprocessing facility. The frequency should in principle be more frequent than the expected conversion time; yet for cost and logistical reasons, the IAEA does not inspect as frequently.

(d) Quantity component for FMCT inspections: What should be a "significant quantity"? Since the states possessing nuclear weapons already have large stocks of fissile materials, an FMCT is not about quantities, but is about a commitment not to produce any fissile materials for weapons purposes. This means that even a gram of newly produced fissile material for weapons purposes would be a violation if it is detected. On the other hand, a significant quantity of fissile material would not automatically be a violation, but would oblige the inspected state to explain the origin of the fissile material in question.

(e) Nuclear material accountancy (NMA): Is NMA necessary under an FMCT? Maybe not, since verification is not dealing essentially with quantities, but it is still useful for detecting clandestine production.

(f) Containment and surveillance (C/S): These tools can be brought over from the IAEA. Look at what material will fall in the flow. There should be seals, flow meters and cameras. Knowing what has been going on in the absence of inspectors is essential.

(g) Environmental sampling (ES): This refers to minute quantities of material collected from the ground, vegetation and objects and then analysed. The application of ES involves two stages: a baseline sampling prior to the initiation of verification that will serve as a reference line for subsequent sampling and laboratory analyses, and subsequent routine sampling performed to obtain data that can be compared for consistency with the established baseline environmental signature and the declared operations. There are limits to the use of ES under an FMCT since such use would be strongly dependant on baseline sampling. For all existing facilities where production took place in the past , the baseline would be so full of historical traces that any clandestine activities could never be visible; even in new facilities cross contamination from past production in other facilities may make ES not useful for FMCT verification.

(h) Verification options/levels: Verification could be applied with different depths. Level 1: a simple state declaration (source materials); level 2: instrumented

verification (e.g. for special fissionable material); level 3: random verification (irradiated direct-use material); level 4: full verification (unirradiated direct-use material).

15. Some participants responded to the Facilitator's view that it was not the *diversion*, but *production* that needed timely detection, as well as his view that it was not a single significant quantity, but plural significant *quantities* that should be the object of FMCT verification. They expressed a view that both diversion and production should be detected, and that differing standards should be avoided between the IAEA and FMCT, and there should be one common significant quantity. Others expressed the view that the fundamental concept of significant quantity was quite a relevant yardstick in the verification of facilities for the detection of the diversion of nuclear materials, but this was irrelevant in the search for undeclared activities.

16. Some participants responded to the Facilitator's view that an FMCT was not about quantities, but only about the commitment not to produce fissile material for nuclear weapons. Some participants stated that the prohibition of the Treaty would be absolute; the challenge would be to determine the scope of the monitoring, ensuring that the scope is commensurate with the object and purpose of the Treaty. In this vein participants discussed the merits and drawbacks of full NMA under an FMCT. A view was expressed that the concept of a significant quantity had been created as a compromise to the cost/benefit perspective in the context of a safeguards agreement between the state party and the IAEA.

17. Several participants did not share the Facilitator's view that FMCT verification should not bother about kilograms in material accountancy. They said that in the situation where a certain amount of raw material was produced, this material could be used for civilian purposes, but it could also be misused for forbidden military purposes. To have a chance of working out whether it was being used for civilian or for other purposes, the inspectorate would have to know how much of this raw material was being produced anywhere. Full material accountancy might not be needed at a facility producing only LEU, but would probably be needed at a HEU-production facility. Some participants stated that the nature of FMCT verification would be different from IAEA safeguards. The applicability of environmental sampling might be one difference. Another could be material accountancy - that trying to detect production of gram quantities of fissile material would be unnecessary and far too costly. FMCT verification arrangements will have to strike a careful balance between principles and practicality.

18. Some participants considered that NMA remained a measure of tremendous importance in the IAEA safeguards for the verification of the absence of the misuse of a facility. In particular, in large and complex facilities, it was very important for inspectors to be able to have a clear idea of what was the flow of materials in those installations. And to do so, it was important to monitor the movement of material. Another element that was very helpful to identify the misuse of a facility was to obtain in advance the operating schedule of the plant, and to visit on short notice to verify that the installation was being used as declared.

19. Others noted that one could expect FMCT-specific problems to arise. For example, many older facilities have never had proper records. Therefore, full NMA, like in non-nuclear-weapon states with precise accounting and low amounts of material unaccounted for should be a long-term goal for an FMCT. In such a case, the short-term goal for an FMCT might need to be more realistic. However, a view was stated that this was no reason to sacrifice the long-term objective of precise accounting. An FMCT had to be seen in the context of the road to a world free of nuclear weapons. When the world reached lower numbers of nuclear weapons, then it would matter if someone had 50 or 52kg of fissile material. When one got there, precision would matter. Historical lessons would be useful, such as the reprocessing plant at Sellafield in the United Kingdom of Great Britain and

Northern Ireland, which had first been military and then became a civilian facility under EURATOM.

20. Some participants said that environmental sampling was a very powerful tool in the IAEA toolkit to detect, e.g. at an enrichment facility, the production of enriched uranium at a higher level than declared. Yet, the IAEA had experienced difficulties with environmental sampling; it was not a panacea.

21. Some participants considered environmental sampling limited as a way to ascertain compliance with treaty obligations due to the difficulty in dating detected fissile material particles. The dating of such samples was technically feasible for plutonium, but extremely difficult for HEU. However, it was noted that the IAEA had been able to see differences between materials produced at uranium facilities some 20 years earlier and those produced recently. One expert added that experiments on uranium age determination had been launched.

22. As to verification levels, one participant reminded that the current IAEA safeguards varied according to material type, e.g. for uranium, according to the enrichment level. FMCT verification should thus do likewise: for example, the verification related to the production of un-irradiated direct-use material should be at a full verification level, but that it could be less for the verification of irradiated direct-use material.

Verification of production facilities

23. Shifting the focus from the verification of "fissile material" to "production facilities", the Discussion Facilitator made a presentation under the heading "Tools for nuclear facilities" as follows:

(a) Categories of facilities: Three such categories under an FMCT: 1) pre-FMCT production facilities, civilian or military, that have been *shut down* (zero power, material still inside), *closed down* (material removed, most equipment still present) or *decommissioned* (key equipment dismantled and removed); 2) pre-FMCT facilities, civilian or military, that are still in operation, including those that have been converted from military to civilian application; 3) new facilities built after the entry into force of an FMCT.

(b) NMA: This is useful to ascertain whether or not there has been misuse of a facility, but not essential. This issue is not so much about gram or significant quantities, but the misuse of the facility itself.

(c) C/S: While NMA is about checking quantities of nuclear materials, C/S is about checking buildings to ascertain there is no backdoor. Containment means here sealing a whole building or some of its rooms. A building that is shutdown is not supposed to be reopened without notice. Seals are meant to freeze a facility. Digital surveillance with video cameras helps to see what is going on, in particular that the seals have not been tampered with.

(d) Design information verification (DIV): The inspectors go to facilities before or during operation to look for hidden features or design modifications. Throughout the lifetime of a facility, inspectors go to make sure there will be no misuse of a facility. This is a mechanical engineering job, looking at drawings, observe changes to facilities. In an FMCT context, there might be confidential information in the design if it has been used for a military facility or there might also be confidential commercial information.

(e) Advanced technology: Satellite imagery can also detect changes in buildings, not only on the site itself, but also in the vicinity.

(f) Verification options for shut/closed down facilities: Seals on key equipment; remote transmission of data, back-to-back surveillance and containment, as well as sensors; periodic as well as unannounced short visits.

(g) Options for facilities with defined fissile material: Random verification, challenge inspections to check there is no diversion; full verification for facilities in operation, whether old or new; environmental sampling with atmospheric sampling; occasional satellite control at site and surroundings. In short, the same technologies that are currently being used by the IAEA.

24. Some participants noted that DIV was an important tool of the IAEA to discover attempts to misuse a facility and to check that there were no changes in the configuration of the cascades at an enrichment plant. Satellite imagery was also a very important tool, which did not necessarily require very high resolution; being able to identify a new suspicious building was sufficient.

25. Some participants cautioned against the excess focus on facilities due to the increased political burden not for FMCT states parties but for FMCT verification implementing organization. Emphasis on facilities would also create problems in terms of the cost of FMCT verification, since a facility-specific verification system would need to be done according to a standard that was not only acceptable to everyone but would also result in a reasonable cost burden. Even with the massive use of technology, human resources would remain central which would entail significant costs. In this regard, the study produced by the IAEA in 1994/95 on FMCT verification costs should be updated.

Pre-FMCT facilities

26. Some participants expressed the view that the sealing of shutdown/closed down facilities was an important tool to ensure permanent coverage of the facilities in question, increasing the detection probability of diversion.

27. Some noted that unlike more recent reprocessing facilities, some older reprocessing facilities had never been designed with verification in mind and could not achieve the same verification standards that could be achieved in newer reprocessing facilities which had been designed to be subject to verification. Others considered that verification of older facilities was still possible, but with higher costs. One participant cited the example of a non-nuclear-weapon state which had overcome technical difficulties and applied safeguards on a reprocessing plant that had been designed and built without verification in mind.

28. Some participants noted that a shutdown facility could still contain “forbidden material”, but not in a closed down facility, since all material had been removed once it was closed. A former “military facility” converted to civilian use was a special case; one could assume that such a facility would have been sanitized before falling under FMCT verification. In other words, the state concerned would remove all evidence of forbidden material in order to create a clean slate for the FMCT inspectorate. From then on, the facility would contain only allowed material. It was noted that France had shut down and decommissioned, in an irreversible and transparent manner, its facilities formerly dedicated to the production of fissile material for nuclear weapons (enrichment plant in Pierrelatte and plutonium generating reactors and reprocessing plant in Marcoule). The former facilities had been visited many times by many groups including diplomats. The dismantlement of the enrichment facility in Pierrelatte was already completed." It is underway in Marcoule.

29. Concerning a definition of a “decommissioned facility”, some participants noted that in the context of the IAEA safeguards, the removal of “essential equipment” would be the end point for verification. Decommissioning therefore did not necessarily mean going back to a “green field”.

Enrichment and reprocessing facilities

30. The Chair invited the Discussion Facilitator to introduce the topic under the heading "Sensitive Facilities". The presentation is as follows:

(a) A real challenge for the IAEA, because of size and complexity.

(b) Enrichment plants: The aim of verification at enrichment plants is to detect diversion of declared nuclear material and any undeclared production (LEU and HEU). Under the NPT, 5% enrichment has been used as the trigger level in civilian facilities (although enrichment to weapons-grade level is authorised *if declared).* Currently there are 16 enrichment facilities under safeguards. Of direct relevance is the IAEA experience based on the Hexapartite Safeguards Project. Environmental sampling would be useless under an FMCT, probably at both old and new facilities, unless new technologies for sample analysis could allow the dating of detected particles.

(c) Limited frequency unannounced access (LFUA): On the other hand, LFUA inspections to centrifuge cascade halls do allow, together with inspection activities outside centrifuge cascades, the timely detection of diversion, while protecting sensitive technical information. The protection of such information is legitimate under both the NPT and an FMCT. Inspection activities would include visual observation, radiation monitoring and non-destructive assay measurements, sampling and application and verification of seals.

(d) Reprocessing plants: At present there are 13 reprocessing facilities under safeguards. Experience in the UK and Japan would suggest that a mixture of announced, unannounced, random and challenge inspections and C/S might be adequate for reprocessing plants under an FMCT. Environmental sampling would, however, not be needed, since direct sampling of various streams would be possible. Accounting should be avoided because of the great complexity.

31. Some participants agreed that LFUA was useful as a strong deterrent. They noted that in verifying reprocessing plants, which were generally large and complex, nuclear material accountancy was needed if one wanted to verify the absence of diversion. Environmental sampling was currently not performed at reprocessing plants, but it might be useful in the vicinity of a plant under certain situations.

Undeclared facilities

32. The Chair invited the Discussion Facilitator to introduce the topic under the heading "Undeclared Facilities". The presentation is as follows:

(a) Undeclared activities under an FMCT? Beyond the verification of facilities and activities declared by a state party, should verification be extended to the search for undeclared facilities and activities? If no, there would be a potential risk that violations would go unnoticed in states with very complex military and civilian infrastructures.

(b) If yes, the task would then be to verify: 1) the absence of undeclared production of fissile material within the facilities that are submitted for inspection; 2) the absence of clandestine facilities; and 3) that specialized equipment/material remains dedicated to peaceful uses (including dual-use equipment).

(c) The IAEA Safeguards Agreements and its Additional Protocol (AP) provides a legal basis for the IAEA to carry out verification activities in non-nuclear-weapon states. Should an AP be a part of the verification for all states parties to an FMCT?

(d) As possible detection techniques, satellite imaging and chemical indicators (possible detection of uranium hexafluoride at enrichment plants and leaks of radioactive fission products at reprocessing plants) would be useful. The work of the Comprehensive-

Nuclear-Test Ban Organization (CTBTO) on atmospheric radionuclide detection would be relevant for detecting undeclared reprocessing activities.

33. Several participants emphasized the usefulness of the AP in FMCT verification. Others considered that while a part of the AP might be applicable to an FMCT, it would be difficult to incorporate it in its current form, thereby necessitating the establishment of an automatic challenge inspection or a trigger mechanism for a special inspection.

34. Some participants expressed the view that random inspections were very useful for the detection of undeclared facilities. Through the use of random inspections, the number of Person-Day-of-Inspections (PDI) for safeguarding reprocessing plants had been drastically reduced. However, the total costs had not correspondingly decreased since the associated support work was not counted in the PDI increases.

35. Regarding the utility of the CTBTO's data, a participant noted that while it might not be feasible to establish a formal link between an FMCT verification organization and the CTBTO, its data might be useful as part of environmental monitoring since the CTBT's states parties had access to that raw data. Another participant was not sure that the CTBT network would be useful for detecting reprocessing, because the radionuclide network detected the noble gas xenon, which had a half-life too short to detect reprocessing. Some sort of krypton detection would be useful, but a worldwide network would not be feasible. One participant questioned the degree of data exchange between international organizations, noting that the OPCW was forbidden to transfer any information to any other organization. However, other participants pointed out that the states themselves ran radionuclide monitoring facilities under the CTBT and they essentially owned the data from their own station, but were obliged of course to supply them to the CTBTO.

Challenge inspections

36. The Chair invited the Discussion Facilitator to introduce the topic under the heading "Challenge Inspections". The presentation is as follows:

(a) Routine inspections are useful for detecting violations, and especially for deterring them, but they are too predictable. The next step up is random, short-notice and unannounced inspections. When these do not suffice, an inspectorate needs even stronger measures: "challenge" or "special" inspections". Chemical Weapons Convention (CWC): In the case of uncertainties and the lack of a state's willingness, the OPCW can call for a challenge inspection, which is its right to come in and look at suspect facilities. Nuclear Non-proliferation Treaty (NPT): Should a state not exercise full transparency, the IAEA can call for a special inspection.

(b) The CWC allows for challenge inspections, with the burden on the party requesting the inspection to define the area to be inspected, the points of entry, and the treaty article the inspected state is suspected of violating. The inspectors are chosen by the Director General of the OPCW who alone determines the size of the team and its individual members, paying due regard to the geographical makeup of team members and the particular skills needed for a specific inspection.

(c) Who is to call a challenge inspection? With the particular confidentiality constraints that will prevail under an FMCT, the CWC model would seem to be more appropriate, namely a call from one or several FMCT states parties. These other states parties would have more solid evidence than the inspectorate, and the latter should be protected against false alarms.

37. Some participants noted that challenge inspections were a very strong tool in terms of verification, but their implementation was very difficult politically and administratively.

This mechanism had never been implemented. In order for challenge inspections to have a deterrent effect, the mechanism must be credible.

38. Some participants questioned the effective applicability of the CWC's challenge inspection mechanism to FMCT verification. If an FMCT verification regime contained such a mechanism, as the Discussion Facilitator mentioned and others pointed out, it would need an automatic challenge or special inspection triggering mechanism. Alternatively, the threshold of a challenge inspection would need to be lowered by making challenge inspections more common, for example, obliging a challenge inspection once every five years. If states lowered the threshold of challenge inspections, routine inspections would need to be more infrequent. Some participants suggested that use of simpler and gradual mechanisms such as consultations, clarification, random inspections and complementary access should be considered before rushing towards challenge or special inspections.

39. Debate then shifted to comparison with inspection approaches under the AP and IAEA Model Safeguards Agreement. Some participants noted that when a special inspection had been called for under the NPT (DPRK in 1993), the inspected state had threatened to walk out of the Treaty. This could serve as a warning signal, inviting a preference for low profile approaches. Under the AP, a state could forbid access to a facility, but should allow the IAEA to take samples all around it as a substitute for visual verification. The IAEA had no specific guidelines for special inspections. The model safeguards agreement stipulated in paragraph 84 that the IAEA might carry out *without advance notification* a portion of the routine inspections. So the random approach for inspections was already there in the agreement. A big difference between such random inspections and special inspections was that under random inspections, inspectors could go to the same place as routine inspections, but randomly. Under special inspection, inspectors could go to other locations, but a big difficulty was that the IAEA must consult with the inspected state for access, and the state might or might not give access to requested locations. Some participants said that a special inspection was a strong tool, but in reality it was a delicate one since discussions for access might go on for a long period, and then nothing might be found. So it was politically risky to trigger this kind of instrument for fear of losing credibility by finding nothing. Building on these experiences, an FMCT could have a special inspection mechanism derived from existing models, but fine-tuned for the requirements of an FMCT.

Sensitive information

40. The Chair invited the Discussion Facilitator to introduce the topic under the heading "Sensitive information". The presentation is as follows:

(a) As a general rule, the verification of the non-production of fissile material for weapon uses raises no confidentiality issues, since under "normal circumstances" no such materials would be present. Moreover, pre-FMCT production facilities (civilian or military) that have been shut down or decommissioned will be sealed. At a subsequent decommissioning/dismantling, measures may be needed to handle weapon-origin nuclear scraps. Pre-FMCT production facilities (civilian or military) that remain in use for civilian purposes would have been sanitised, with only civilian nuclear materials left.

(b) Managed access under an OPCW challenge inspection: The inspected party "has the right under managed access to take such measures as are necessary to protect national security". *"Rights under managed access include removal of sensitive papers; shrouding of sensitive displays, stores, and equipment; shrouding of pieces of equipment such as computer or electronic systems; logging off computer systems; restricting sample analysis to detecting the presence or absence of chemicals; restricting inspectors to a certain percentage of randomly selected buildings within the access area; and giving only*

individual inspectors access to certain inspection sites. These rights, however, may not be invoked by the inspected party in order to conceal activities which violate treaty articles."

(c) Managed access under the IAEA-AP: "*Upon the request of the State, the IAEA and the State shall make arrangements for managed access, arranged in such a way as to prevent the dissemination of proliferation sensitive information, to meet safety or physical protection requirements, or to protect proprietary or commercially sensitive information. Such arrangements shall not preclude the Agency from conducting activities necessary to provide credible assurance of the absence of undeclared nuclear material and activities at the location in question, including the resolution of a question relating to the correctness and completeness of the information referred to in Article 2 or of an inconsistency relating to that information*".

(d) The verification of the non-production of fissile material under an FMCT is only marginally more complex than under the NPT. The IAEA arrangements for managed access can satisfy both the verification requirements and the confidentiality constraints. Special IAEA arrangements for enrichment plants, such as the Hexapartite agreement, are also applicable. Verification activities undertaken to detect clandestine facilities in states possessing nuclear weapons may have to be more restrictive than in non-nuclear-weapon states.

41. In the context of a question about whether the concept of managed access embodied in Article 7 of the IAEA-AP, and/or managed access as defined in the CWC, should be introduced in an FMCT, some participants noted the importance of the concept of managed access in balancing both verification requirements and information confidentiality. In fact, the existing practice of managed access could be a good basis. Other participants emphasized that it would be difficult to transfer to an FMCT arrangements from different treaties and that it would need to find its own specific ways to use managed access. There are a large number of sensitive military facilities, not just enrichment and reprocessing facilities, in states possessing nuclear weapons that would be subject to inspections.

42. There was general acceptance of a country's need to protect sensitive information. One participant wondered if the issue of protecting sensitive information was exaggerated. In response, others emphasized that, besides national security interests, nuclear-weapon states had a legal non-proliferation obligation under Article 1 of the NPT.

43. One participant thought it important to clarify the terminology around the concept of "sensitive information". The first level of "sensitive information" would be commercial. The next level would be confidentiality at former military facilities that produced fissile materials for weapons purposes. Then, with regards to other activities under an FMCT that were military-related, this would be a further level of sensitivity. Finally, a challenge inspection that might conceivably involve close contact with some weapons-related activities in order to clarify uncertainties would be the upper-most limit in terms of sensitivity. So, there were many different types of information that could be sensitive, weapons-related at the top and commercial at the bottom, each different in terms of access and intrusiveness. Some participants emphasized that information related to production techniques or the ways in which facility operations are fine-tuned can be commercially sensitive as well as security sensitive.

44. Some participants noted that naval propulsion would be a challenge for the IAEA in the near future within the framework of NPT safeguards. One non-nuclear-weapon state (and others in the past) had indicated their intention to use nuclear power for naval propulsion. Indeed, this was something anticipated in the Comprehensive Safeguards Agreement under Article 14. Arrangements will need to be found to protect the confidentiality of fuel designs, be it under NPT or FMCT.

45. The Chair of the side event does not intend to draw any conclusion as to what verification measures and methods the participants agreed and did not agree to be applicable to FMCT verification. But as can be seen from the above summary, there is a strong view among many states that negotiators should first look at the current IAEA safeguards measures as a basis and then see which ones could be applicable to an FMCT; and that there are already a number of effective verification measures and methods readily applicable and other measures that could be applicable with necessary adjustments.

III. Theme 3: Other verification-related matters

Legal structure of an FMCT

46. In a discussion on the legal structure of an FMCT, some participants argued for a two-step approach. Through this approach, there should first be a central instrument that described the key obligations and very broadly the central verification principles and approaches. The detailed modalities and guidelines of that verification system would be then set up separately between the state concerned and the verification organization. This had some parallel with the NPT and its comprehensive safeguards agreements. In this respect, the NPT was a concise document, but might be too concise for an FMCT. Others argued that in the case of an FMCT, a treaty text longer than the NPT might be more appropriate, addressing central verification issues like definitions, the verification approach at enrichment and reprocessing facilities and a verification model protocol. There would be a separate facility agreement for how a particular facility would be inspected.

47. On the other hand, some participants argued that it was still too early to speculate on the legal structure of an FMCT and we should remain open minded until the substance of the treaty became clearer.

48. In relation to the two-step approach, some argued that becoming party to an FMCT for NPT non-nuclear-weapon states with comprehensive safeguards agreements and the additional protocol should necessitate no additional instruments.

Organizational issues

49. Many participants argued that an FMCT should take advantage of the technical know-how and tremendous experience and expertise of the IAEA, but it was acknowledged there would be challenges. One difficulty pointed out was the budget of the IAEA. An arrangement was suggested where there would be a single inspectorate within the IAEA serving two treaties – overseen by two Boards of Governors - with two specific funding schemes was suggested. This arrangement would allow the exchange of know-how and personnel while at the same time avoiding a number of complexities arising from the existing organization.

50. Some participants stated the view that an FMCT organization would not have to be very large and its mandate would be defined on what the states parties would want the organization to do. There would have to be a separate agreement in this respect.

IV. Theme 4: Wrap-up

51. At the end of this experts side event, the Chair presented a non-paper, which is annexed to this report, listing a number of major questions addressed during this side event. This non-paper is not intended to be exhaustive but just to serve as future reference material, without prejudice to prospective discussions and negotiations on an FMCT.

Annex

A list of some discussed issues on FMCT verification

1. What could be the relationship between definitions and verification?

2. What could be the purpose of FMCT verification?

3. How could the existing IAEA safeguards approach be adapted to FMCT verification?

   (a) Inspection Goals

   (b) Conversion Time

   (c) Detection Time

   (d) Significant Quantity

4. How could the existing IAEA safeguards measures applied to materials and facilities be adapted to FMCT verification? What could be some of the limits of such measures in FMCT verification?

   (a) Material Accountancy

   (b) Containment and Surveillance (C/S)

   (c) Environmental Sampling (ES)

   (d) Design Information Verification (DIV)

   (e) Remote Monitoring

   (f) Satellite Imagery

5. How could pre-FMCT facilities be verified?

   (a) Shut down facilities

   (b) Closed down / Decommissioned facilities

   (c) Converted facilities

6. How could post-FMCT facilities be verified?

   (a) Enrichment and reprocessing facilities

   (b) Production reactors

   (c) Other facilities?

7. How could undeclared production activities be detected?

8. How could challenge inspection be incorporated?

9. How could sensitive information be protected? How could managed access be applied?

10. What might the legal structure of FMCT verification look like?

    (a) Details in the integral part of the treaty?

    (i) Treaty itself? (CTBT)

    (ii) Protocol? (CWC, CTBT)

(b) Details in a separate form to be agreed later?

(i) Model verification agreement? (NPT)

11. What might the FMCT verification organization look like? What could be the role of existing organizations such as the IAEA and the CTBTO?