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Held at the Palais des Nations, Geneva,
on Thursday, 24 August 2006, at 10.25 a.m.

President: Mr. Anton PINTER (Slovakia)

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The PRESIDENT: I declare open the 1037th plenary meeting of the Conference on Disarmament.

At the outset, I would like to warmly welcome Dr. Tariq Rauf, Head of Verification and Security Policy of the Office of External Relations and Policy Coordination of the International Atomic Energy Agency. He is with us today, invited by the Conference, to make a presentation on the prohibition of the production of fissile material for nuclear weapons and other nuclear explosive devices.

Following his presentation, the Conference will hold an informal plenary meeting during which delegations will have an opportunity to ask questions of Dr. Tariq Rauf and his colleague, Mr. Robert Fagerholm, and make comments. After the conclusion of the informal plenary meeting, the Conference will reconvene a plenary meeting to continue its consideration of agenda item 7, entitled "Transparency in armaments".

I now give the floor to Dr. Tariq Rauf.

Mr. RAUF (International Atomic Energy Agency): The International Atomic Energy Agency is grateful for this opportunity to come and make a presentation on issues related to a cut-off of production of fissionable material for nuclear weapons or other nuclear explosive devices. Since IAEA's main task is nuclear verification, the thrust of my presentation will deal with issues related to nuclear verification.

I have with me Mr. Robert Fagerholm, who is from the Division of Concepts and Planning in the Department of Safeguards. He is a nuclear inspector, and both he and I will endeavour to answer your questions following my presentation.

My presentation is divided into four parts with a brief introduction, followed by a definition of terminology as we use it at IAEA in the context of nuclear verification; a little update on verification of nuclear materials coming out of nuclear weapons; and then, finally, a short brief on verification choices and a conclusion. My statement is relatively long, so I hope you will bear with me.

You will recall that in December 1993 the United Nations General Assembly adopted resolution 48/75 L, which, inter alia, requested the International Atomic Energy Agency to provide assistance, as requested, for examination of verification arrangements for a non-discriminatory, multilateral and internationally and effectively verifiable treaty banning the production of fissile material for nuclear weapons or other nuclear explosive devices, or FMCT.

At that time IAEA conveyed its readiness to provide assistance, as required, and its secretariat carried out internal studies to analyse the potential verification requirements of a fissile material production cut-off and prepared preliminary estimates of the resources needed for their implementation. These findings were duly conveyed at various FMCT workshops to member States of the Conference on Disarmament.

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In the secretariat's view, an FMCT as foreseen by General Assembly resolutions, the Shannon mandate and the NPT States parties would include an undertaking not to produce any fissile material for use in nuclear weapons or other nuclear explosives or to assist other States in pursuing such activities. Insofar as the production of such material for other legitimate purposes is concerned, it would follow that verification arrangements would need to be such as to meet all the requirements of the undertaking of an FMCT.

In the IAEA secretariat's view, the technical objective of verifying compliance with an FMCT would be to provide assurance against any new production of weapon-usable fissile material and the diversion of fissile material from the civilian nuclear fuel cycle to nuclear-weapon purposes. Thus there would be the need to ensure that stocks of plutonium and highly enriched uranium to be used for nuclear-weapon purposes, where they exist at the date of entry into force of an FMCT, are not increased thereafter. A related issue would be how to deal with existing stocks of weapon-usable material.

A number of issues will have to be addressed by the States in order to clarify the basic undertaking of the States parties and the scope of an FMCT verification regime. These issues, as far as verification is concerned, can be reduced to two basic questions in the view of the IAEA secretariat. One, how is the undertaking not to produce fissile material for weapon purposes to be verified? Could the undertaking, as agreed, be verified with a high degree of assurance by simply focusing on verification activities at a core of facilities, or should the verification activities be comprehensive? Secondly, how, and to what extent, should verification ensure that stockpiles for nuclear-weapon purposes, where they exist, are not increased, and, where they do not exist, are not created thereafter?

The way in which States will address these issues would determine, first, the verification architecture and the scope of activities under the verification system; second, the ability of the verification organization to provide a high degree of assurance that no activity proscribed by the treaty is being conducted in or by a particular State, particularly through provisions to enable the verification body to detect possible undeclared nuclear facilities and activities, including fissile material production; and third, the overall costs of the verification system for the States party to an FMCT.

With regard to definitions of fissile material and nuclear material, United Nations General Assembly resolutions and the Shannon mandate refer to "fissile material". In this regard, it would be useful to provide a precise definition of fissile material. For example, fissile material might be defined as nuclear material from which nuclear weapons or other nuclear explosive devices could be manufactured directly, without the need for further enrichment or transmutation. This would correspond to the term "direct-use nuclear material" as used in IAEA safeguards.

The term "fissile material" is not used in implementing IAEA safeguards agreements. Rather, IAEA safeguards are applied to "nuclear material", which is defined as any source or special fissionable material - and this comes from article XX of the IAEA Statute. "Special fissionable material" is defined in the IAEA Statute as "plutonium-239; uranium-233; uranium enriched in the isotopes 235 or 233; any material containing any of the foregoing; and such other

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fissionable material as the Board of Governors shall from time to time determine". The term "source material" is defined in the IAEA Statute as "uranium containing the mixture of isotopes occurring in nature; uranium depleted in the isotope 235; thorium; any of the foregoing in the form of metal, alloy, chemical compound, or concentrate; any other material containing one or more of the foregoing in such concentration as the Board of Governors shall from time to time determine; and such other material as the Board of Governors shall from time to time determine".

In the context of IAEA safeguards, "nuclear material" is further categorized into "direct-use nuclear material", and this can be of two types: unirradiated and irradiated. Direct-use nuclear material is that which could be used in the manufacture of nuclear weapons or other nuclear explosives without transmutation or further enrichment. The second type of material that is referred to in IAEA safeguards is "indirect-use nuclear material". This would require irradiation or enrichment to make it suitable for use in nuclear weapons. For the purposes of IAEA safeguards, "direct-use nuclear materials" are: plutonium except that containing 80 per cent or more of the isotope plutonium-238, uranium containing 20 per cent or more of the isotope uranium-235, and uranium-233. "Separated direct-use nuclear materials" are those direct-use nuclear materials that have been separated from fission products, and thus the processing that would be required for their use in nuclear weapons is substantially less, and the times required substantially shorter, than if mixed with highly radioactive fission products. The definition of fissile material to be included in an FMCT could be close to this definition of separated direct-use nuclear material. Differences in basic definitions could perhaps complicate the obligations as well as actions required of States and the implementation of IAEA safeguards and FMCT verification.

A brief word about the types of IAEA safeguards: IAEA safeguards are applied under different types of agreements and arrangements, and the scope, objectives, measures, technology, evaluations and reporting employed vary.

Following the conclusion of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) in 1968, IAEA has become the instrument with which to verify that the "peaceful use" commitments made under the NPT, or similar agreements, such as nuclear-weapon-free-zone treaties, are kept through the implementation of safeguards.

At present, 183 non-nuclear-weapon States parties to the NPT have undertaken treaty commitments that include a commitment not to manufacture or otherwise acquire nuclear weapons or other nuclear explosive devices. Such States have also undertaken to submit all nuclear material in all nuclear activities to IAEA safeguards, and to conclude a comprehensive safeguards agreement or CSA with IAEA to fulfil their obligation under article III of the NPT.

The five nuclear-weapon States (NWS) parties to the NPT have in force voluntary offer safeguards agreements with IAEA, which cover some or all civilian nuclear material and/or facilities from which IAEA may select material or facilities for the application of safeguards.

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In non-NPT States, IAEA safeguards are applied at specific facilities to the facilities themselves or to nuclear material and other items specified in the relevant safeguards agreement.

I will now describe briefly how IAEA applies safeguards in States with comprehensive safeguards agreements, and these are non-nuclear-weapons States parties to the NPT. IAEA safeguards are regarded as a cornerstone of the international nuclear non-proliferation regime, and comprehensive safeguards agreements (CSAs) are the cornerstone of IAEA safeguards. CSAs obligate States to submit all nuclear material to IAEA safeguards and obligate IAEA to apply safeguards to all nuclear material submitted by States pursuant to such agreements. The scope of IAEA safeguards in States pledging not to develop or otherwise acquire nuclear weapons includes what is understood to be “fissile material”, together with nuclear material other than fissile material. CSA verification activities address possibilities involving both declared nuclear activity and undeclared activity. They are intended to confirm that all nuclear materials are submitted to safeguards and remain committed to peaceful use.

There are two verification objectives that guide the implementation of IAEA safeguards under CSAs: first, to detect the diversion of significant quantities of nuclear material declared by the State from peaceful use to the manufacture of nuclear weapons; a “significant quantity” is defined as nuclear material for which the possibility of manufacturing a nuclear explosive device cannot be ruled out. In general, for direct-use material, this is 8 kilograms of plutonium and 25 kilograms of highly enriched uranium.

The second objective of comprehensive safeguards is to verify the correctness and completeness of the declarations made by States, including the objective to detect undeclared production of fissile materials anywhere within the territory of the State, under its jurisdiction or carried out under its control anywhere.

Some of the measures that are related to verification at declared facilities in States with CSAs are as follows. Over the years, standard criteria have been adopted to guide the implementation of safeguards at declared facilities, affecting the extent and quality of information to be provided by States, design information verification activities, the safeguards approach to be applied at the facility to satisfy safeguards goals, and specific requirements related to inspection frequencies, inspection activities and the outcome of these activities. As I mentioned, for plutonium and for uranium-233, an amount of 8 kilograms is considered adequate for a State to produce its first nuclear weapon, taking into account process losses and the need to be conservative in the design, without the benefit of nuclear tests. For highly enriched uranium (HEU), an amount of 25 kilograms of the isotope uranium-235 is similarly considered adequate. These criteria reflect the non-proliferation objective for comprehensive safeguards agreements establishing fixed-quantity definitions for verification parameters that serve as a basis for planning and evaluating IAEA safeguards.

Under CSAs, a “State system of accounting for and control of its nuclear material”, referred to as an SSAC, must be created to be responsible for implementing, inter alia, effective material accountancy arrangements and to control imports and exports. States must make extensive declarations regarding their nuclear activities at safeguarded facilities and report at specified periods on their nuclear material inventories and flows. When a CSA first enters into

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force, the initial inventory declaration is investigated closely to ensure that it is complete and accurate. Subsequently, in relation to each facility a State declares, the State is required, inter alia, to provide design information, carry out nuclear material balances annually and report material unaccounted for on the basis of a measured physical inventory and measured inventory changes. Such State declarations are verified by IAEA to ensure that they are complete and correct, and that declared nuclear materials are thus not diverted to the manufacture of nuclear weapons. The agency also implements measures related to undeclared nuclear materials and activities in States with comprehensive safeguards agreements.

The discovery in 1991 of an extensive clandestine nuclear-weapon programme in Iraq, an NPT non-nuclear-weapon State subject to a CSA, bore witness to the fact that a safeguards system that concentrated on verifying declared activities was inadequate. In strengthening the safeguards system, the IAEA Board of Governors recognized that to address the possibility of clandestine operations, some provision for access had to be provided to locations anywhere within the territory of a State with a comprehensive safeguards agreement. The Additional Protocol to CSAs was created to extend the authority of IAEA to require States to provide the additional information, access and technology required for the implementation of safeguards.

The provisions of Additional Protocols allow IAEA to require information on States' nuclear programmes, including research and development, facilities that never operated or were decommissioned, and activities relating to the manufacture or import of specified equipment that could be used to produce or purify nuclear materials. They also allow for complementary access to ensure the absence of undeclared nuclear material and activities or to resolve questions pertaining to activities or materials, including managed access to locations in order to prevent the dissemination of proliferation-sensitive information, to meet safety or physical protection requirements, or to protect proprietary or commercially sensitive information. Integrating the assurances regarding possible clandestine facilities or undeclared activities in declared facilities as provided through the Additional Protocol has allowed IAEA to adapt its verification requirements at declared installations. Integrated safeguards under a comprehensive safeguards agreement, together with Additional Protocols, take States' specific features into account as a means to differentiate between the verification activities needed on a non-discriminatory basis using safeguards verification objectives common to all States with CSAs.

As part of strengthening the safeguards system, IAEA has been applying "integrated safeguards", a more effective approach that combines the verification activities carried out under CSAs with more advanced methods of analysis and the enhanced access under the Additional Protocol. State-level integrated safeguards approaches take State-specific features into account, such as the effectiveness of the SSAC and the features of the State's nuclear fuel cycle. As of 2005, IAEA has applied integrated safeguards in multiple States, including Japan and Canada, the two largest programmes under safeguards. Our goal is to universalize the application of the Additional Protocol, so that its expanded rights of access apply equally in all States with CSAs. To date, Additional Protocols have been signed by 109 States and have been brought into force in 77 States.

(<u>Mr. Rauf, International Atomic Energy Agency</u>)

The Agency has also established a Committee on Safeguards. This is called Committee 25. Its mandate is to examine additional ways and means to strengthen IAEA's safeguards system.

As I mentioned, IAEA also applies safeguards in States that are not parties to the NPT. IAEA safeguards implementation in such States is applied in the safeguards agreements that were established prior to the NPT to cover research and power reactors, components thereof, nuclear fuel and heavy water. These agreements stipulate that any fissile material created through irradiation in those reactors is also subject to safeguards, and any plant processing or using that fissile material will be subject to safeguards as long as that safeguarded nuclear material is in the facility.

Safeguards implementation in nuclear-weapon States parties to the NPT: NWS parties to the NPT - France, China, the Russian Federation, the United Kingdom and the United States of America - have entered into voluntary offer safeguards agreements modelled on CSAs. These VOA agreements place no obligation on the State in relation to the nuclear materials to be subject to safeguards, and they permit the State to withdraw nuclear material and to remove facilities from the list designated by the State from which the Agency can select for the purposes of safeguards implementation. Moreover, there is no obligation on IAEA to carry out safeguards at facilities designated by the nuclear-weapon State. At present, the most germane application of IAEA safeguards to an FMCT is at enrichment plants in China and the United Kingdom. All nuclear facilities in France and the United Kingdom, except those dedicated to nuclear-weapon programmes and naval reactor programmes, are subject to EURATOM safeguards under the provisions of the Treaty of Rome. EURATOM is seen as a regional control authority, and a partnership arrangement has evolved where both IAEA and EURATOM apply safeguards in States of the European Union.

The Additional Protocol is also relevant to the NWS, as well as non-parties to the NPT. All five NWS recognized by the NPT have signed Additional Protocols, and three of the NWS have brought them into force. For the most part, the Protocols adopted by the NWS are intended to provide IAEA with additional information to assist the Agency in safeguarding nuclear activities in NNWS. The Protocols in the NWS and the non-parties to the NPT may affect or be affected by considerations that might be included in an FMCT relating to exports of equipment or materials that could assist other States in efforts to acquire the capability to produce fissile material.

There are also other relevant IAEA verification activities. IAEA carried out extended verification measures in Iraq under the provisions of United Nations Security Council resolution 687 and related resolutions, including unrestricted access to locations of interest and wide-area environmental monitoring to detect clandestine production of fissile material. The experience gained in this extreme situation may be of benefit in considering the access provisions to be established under an FMCT, the rights granted and the difficulties encountered.

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IAEA monitored a freeze on operations at nuclear facilities in DPRK in relation to an Agreed Framework concluded between the DPRK and the United States, including monitoring a freeze on operations at the reprocessing plant at Nyongbyon, which was maintained at operational stand-by. Again, the experience gained may be of benefit in considering provisions for inspections under an FMCT.

IAEA has also participated with the Russian Federation and the United States in a trilateral initiative to develop a verification system for excess defence fissile materials in those two States, and I will describe that now.

The Trilateral Initiative was launched by Russian Minatom Minister Viktor Mikhailov, IAEA Director General Hans Blix and United States Secretary of Energy Hazel O'Leary at their 17 September 1996 meeting. The aim of this initiative was to fulfil the commitments made by Presidents Clinton and Yeltsin concerning IAEA verification of weapon-origin fissile materials and to complement their commitments regarding the transparency and irreversibility of nuclear arms reductions.

The three parties established a Joint Group to consider the various technical, legal and financial issues associated with IAEA verification of relevant fissile materials. The group sought to define verification measures that could be applied at Russia's Mayak Fissile Material Storage Facility upon its commissioning and at one or more United States facilities where identified weapons-origin fissile material removed from defence programmes would be submitted for verification. The task that was entrusted to the Trilateral Initiative Working Group was declared concluded on 16 September 2002.

The task included addressing the scope and purpose of IAEA verification; the locations, types and amounts of weapon-origin fissile material potentially subject to IAEA verification; technologies that might be capable of performing verification and monitoring objectives without disclosing sensitive information; and options for funding and providing a legal framework for IAEA verification.

Every nuclear weapon uses one or more fission energy elements, and every fission energy element of every nuclear weapon requires certain fissile material, generally plutonium containing 93 per cent or more of the isotope plutonium-239, or highly enriched uranium. Controls on the possession, production and use of such materials are the basis for the international non-proliferation regime. Similarly, as the nuclear-weapon States parties to the NPT move to meet their obligations under article VI of that Treaty, a treaty banning the production of fissile material for use in nuclear weapons or other nuclear explosive devices, together with a framework with provisions for removing existing materials from nuclear weapons, could become a central part of the arrangements to come.

Placing weapons material under international verification can serve different purposes, depending on when it occurs and on the scope of verification. For example, if the fissile material has been processed to the point that it no longer has any properties that could reveal weapon secrets, then bringing that material under inspection with an undertaking that it cannot be reused for military purposes serves two purposes: first, capping the capabilities of the State (together with a production ban), and second, providing a means to build confidence and thereby encouraging further arms reductions and increasing the amounts of excess material subject to verification. Including provisions for inspecting fissile materials that still contain weapon secrets could add an additional benefit: namely, allowing the submissions to proceed much faster than otherwise, given the high costs and lengthy periods required for converting weapon materials to unclassified forms. Allowing IAEA verification of weapon materials having classified properties can only be considered if the State is convinced that the verification process will not reveal such properties. Including provisions to confirm that the properties of items submitted are characteristic of nuclear-weapon components could allow monitoring of the arms reduction process. If the above measures are implemented, then in principle it would be possible to begin verification at the point where warheads are de-mated from their delivery systems, allowing for the verification of specific arms reduction measures.

Under the Trilateral Initiative, the verification encompasses the first two steps.

The steps necessary to verify classified forms of fissile material introduce new requirements on the verification processes and equipment to be used by IAEA. However, if a verification scheme could be implemented that States possessing nuclear weapons could accept, then this would open the possibility of moving faster and moving further towards confirming the steps taken towards disarmament.

Much of the technical work carried out under the Trilateral Initiative over the past years has been devoted to designing a verification technique that could allow nuclear-weapon States to invite IAEA inspectors to make measurements on the components of nuclear weapons without any possibility that the inspectors might gain access to nuclear-weapon design secrets. At the same time, the verification technique must allow IAEA to gain sufficient assurance that the verification is credible and independent. Every possible measurement method was considered, beginning with those currently used by IAEA in safeguarding plutonium and HEU in non-nuclear-weapon States. The Trilateral Initiative parties concluded that every method identified could reveal weapon secrets if inspectors were allowed access to the raw measurement data. Therefore, direct, quantitative measurements following normal IAEA safeguards practices were ruled out.

It was then agreed that IAEA verification of weapon-origin fissile material would be based upon measurements that would provide the most robust verification, but the measurement systems would be designed in such a manner that IAEA inspectors would only be presented with “pass/fail” information. As the raw measurement data could reveal classified information, special security provisions would be included in the measurement systems to prevent any storage of classified information, and to disable the systems in the event access to the raw measurement data was attempted. The “pass/fail” determinations would be made by comparing the actual measurement data to unclassified reference “attributes”. The method adopted is referred to as “attribute verification with information barriers”. The following attribute tests for IAEA verification of excess plutonium in a container were agreed upon: the presence of plutonium; weapon-grade isotopic composition, and amount of plutonium greater than a specified threshold mass.

(<u>Mr. Rauf, International Atomic Energy Agency</u>)

"Information barriers" combine hardware, software and procedural protective systems in a layered structure designed to provide defence-in-depth protection of classified information. The Trilateral Initiative experts have developed a General Technical Requirements and Functional Specifications system for measurements. A prototype of the measurement system was developed and demonstrated. It is referred to, as I have mentioned, as an "Attribute Verification System with Information Barrier for Plutonium with Classified Characteristics Utilizing Neutron Multiplicity Counting and High-resolution Gamma-ray Spectrometry". The acronym for that is AVNG. A full-scale system is now under construction at the Russian Federal Nuclear Centre/All-Russian Scientific Research Institute of Experimental Physics at Sarov, formerly known as Arzamas-16, under a contract with Los Alamos National Laboratory of the United States. This system will measure storage containers holding classified forms of plutonium, and a demonstration container is kept at IAEA headquarters.

All instruments to be used in this attribution/verification system must be manufactured in the country where they will be used. The country itself will certify them, and the certification will include normal industrial concerns plus certification against espionage in effect to ensure that IAEA inspection does not lead to any release of classified information. Normal IAEA authentication practices cannot be used under these limitations, and therefore a new approach is being developed. Authentication remains the most challenging task for IAEA.

In addition, the Agency has also been working together with the United States and the Russian Federation on the Plutonium Management and Disposition Agreement, under which the two countries have agreed to the symmetric disposition of 34 metric tons of weapon plutonium on each side. The costs for disposition under this initiative were estimated at about $2 billion in the Russian Federation and about $6.6 billion in the United States.

For unclassified forms of fissile material, the verification measures should be similar to those applied under IAEA non-proliferation safeguards in non-nuclear-weapon States. However, even then there will be requirements for departures from IAEA safeguards. As some of the facilities will be located at sites used for nuclear weapons work, and even for the facilities in which unclassified forms of fissile material are found, site security restrictions could complicate the implementation of normal safeguards practices in connection with the PMD. There is also the practical matter of the verification effort that should be given to the materials after they have been blended or irradiated to the point that they would be less well suited for weapon purposes than the comparable materials found in the civil sector.

If classified forms of fissile material are subject to verification, the State must make declarations. However, neither the Russian Federation nor the United States could declare the properties of classified forms of fissile material without violating article I of the NPT and their respective national laws.

Under IAEA safeguards, the Agency carries out unrestricted measurements of all nuclear properties and takes representative samples of the nuclear material subject to safeguards in which all properties, including impurities, are measured to the highest standards of precision and accuracy. For classified forms of fissile material, clearly such measurements could not be undertaken.

(Mr. Rauf, International Atomic Energy Agency)

Agency safeguards agreements are a part of the nuclear non-proliferation system which is intended to prevent non-nuclear-weapon States from acquiring even one nuclear weapon. The two NWS involved in the Trilateral Initiative both possess thousands of nuclear weapons and are in the process of reducing those to substantially lower levels, hopefully eventually to zero. The verification requirements applied for nuclear disarmament must eventually converge with the non-proliferation verification requirements, but this obviously will take some time. The Agency, as you know, is already verifying uranium enrichment and reprocessing in a number of States, including nuclear-weapon States.

As the scope and verification requirements for an FMCT are to be established, the relevance of IAEA experience and existing requirements in States would enable detailed investigations to proceed for specified types of facilities or for specific facilities as appropriate.

I will describe briefly how IAEA verifies declared reprocessing plants. The plutonium produced in nuclear reactors is separated from the uranium, fission products and other actinides in reprocessing plants. With very few exceptions, all plutonium-reprocessing plants employ the same process technology, called Purex. Reprocessing plants require processing of intensely radioactive materials and hence require remote processing within very substantial structures to contain the radioactivity. These characteristics, together with difficulties inherent in measuring accurately the amounts of plutonium at the starting point of the processing, make the application of safeguards very complex and more expensive than any other safeguards application.

IAEA safeguards at reprocessing plants are designed to detect the misuse of the facility, that is, undeclared reprocessing, and diversions from declared flows and inventories of plutonium. Meeting safeguards verification requirements is most difficult in large operating plants, as the IAEA safeguards goals are fixed in terms of amounts necessary for manufacturing one nuclear weapon, and as those amounts become small in relation to the total amounts of nuclear material processed, the safeguards approach must therefore be expanded in scope and made increasingly intrusive in order to provide the required assurance that the plants are not misused and that the nuclear materials are accurately measured, declared and not diverted.

IAEA safeguards at reprocessing plants begin with the examination of information required of the State on relevant aspects of the design and construction of the facility, on its operation and on the nuclear material accountancy system employed. During construction, commissioning and thereafter during normal operations, maintenance and modifications, and into decommissioning, the design information is verified through inspector observation and appropriate measurements and tests to confirm that the design and operation of the facility conforms to the information provided. In addition, environmental sampling may be applicable depending on the circumstances.

Safeguards at reprocessing plants include the taking of samples for analysis at the IAEA Safeguards Analytical Laboratory, located in Seibersdorf, Austria, and at some 15 other labs located in member States that form the Agency’s Network of Advanced Analytical Laboratories.

With respect to clandestine reprocessing plants, in a CSA State, any undeclared reprocessing would constitute a clear violation of the provisions of the Safeguards Agreement

(Mr. Rauf, International Atomic Energy Agency)

and the Additional Protocol. Reprocessing operations normally involve the release of gaseous fission products into the atmosphere and the release of particulates, some of which are deposited at significant distances from the facility. The detection measures for detecting clandestine plants are as follows: we use enhanced information analysis. We use complementary access. This is another form of inspection. We use a wide range of environmental sampling. The Agency is also verifying enrichment at declared enrichment plants.

IAEA safeguards at a uranium enrichment plant are intended to meet three objectives: first, to detect the production of HEU, or excess high-enrichment production if high-enrichment production is declared; second, to detect excess LEU production that might subsequently be further enriched at a clandestine plant or within a plant under safeguards, with a higher risk of detection; and third, to detect diversion from the declared uranium product, feed or tails streams.

The nuclear material accountancy measures applied to detect diversion from the declared feed, product and tails streams in an enrichment plant provide a means to ensure that a plant is not being used to produce undeclared HEU, and in those cases where a low-enrichment plant has been used earlier to produce HEU, this method assumes increased importance for the Agency.

As in the case of reprocessing plants, design information examination and design information verification are central to the implementation of safeguards at enrichment plants. Enrichment technology is considered to be proliferation-sensitive, and thus IAEA inspector access to the areas where enrichment equipment is installed is restricted by the technology holders, and inspector observation of the inside details of enrichment equipment is limited, as is access to critical plant operating parameters. Nonetheless, effective verification arrangements have been established within these restrictions that allow IAEA to meet the objectives indicated.

After reprocessing, the Agency does design information examination and verification, and environmental monitoring. If the plant is producing HEU for a non-proscribed purpose, or if a low-enrichment plant was formerly used for HEU production or is near a high-enrichment plant, environmental sampling may be less useful. The safeguards approach in such facilities would require greater emphasis on other aspects of the safeguards.

For a given enrichment technology, in a manner similar to that for declared reprocessing plants, the safeguards approach for an enrichment plant will depend to a great extent on the operational status of the facility. In particular, the following conditions are fundamental to establishing effective and efficient safeguards at enrichment plants.

At operating enrichment plants, the Agency looks at whether the plant is producing HEU for non-proscribed purposes. Here the verification must ensure that only the declared amounts of HEU are produced, and therefore environmental sampling may have limited relevance in this particular case. The Agency also looks at whether the plant is producing LEU in a plant reconfigured from earlier high-enrichment production or in a plant near another plant used for HEU production. Again the verification activities would be intended to detect undeclared HEU production, and this will be a more complicated task due to the remaining traces of HEU. And therefore again, environmental sampling in this case may also be of less importance.

(Mr. Rauf, International Atomic Energy Agency)

For each enrichment plant, depending on its technology, operational status, capacity and layout, the following measures are incorporated in IAEA safeguards. We measure the amount of uranium and the enrichments of uranium in feed, product and tails cylinders. There is application of containment and surveillance measures. These are technologies for remote monitoring in fields and so on on feed, product and tails cylinders, and at key parts of the plant, in particular at the uranium feed point and the product and tails removal points, and at locations where instruments are installed to maintain continuity of knowledge of verified information and to track operations to determine whether or not observed operations conform to operator declarations. In some facilities the use of limited-frequency unannounced access inspections into the cascade hall to detect plant modifications that might signal high-enrichment operations is also employed.

With respect to clandestine enrichment plants, the Agency's methods used to detect undeclared enrichment plants are essentially the same as for undeclared reprocessing plants. Again as with reprocessing, enrichment operations normally result in the release of aerosols. These aerosols may not travel very far, and thus environmental sampling is likely to be effective only close to such facilities.

The difficulty in finding emissions from clandestine enrichment plants is further compounded by advances in enrichment technology that greatly reduce the size of plants and reduce the electrical power requirements. Therefore the Agency relies on enhanced information analysis, and the State is required to be thorough in providing information relating to research and development linked to enrichment, manufacturing and importing enrichment equipment and specialized materials such as carbon fibre vessels and maraging steel, and the construction, operation and decommissioning of any enrichment plants, past, present and future. The same thing goes for complementary access as for reprocessing, and, as I mentioned, environmental samples are also useful, but there are certain limitations in the case of monitoring enrichment plants.

What are the verification choices for an FMCT? IAEA has studied possible verification scenarios and their associated costs and the level of assurance that those alternatives may provide with respect to compliance by States party to an FMCT.

With regard to verification coverage, from a technical perspective, applying verification arrangements to anything less than a State's entire nuclear fuel cycle could not give the same level of assurance of non-production of fissile material for nuclear explosive purposes as is provided by IAEA in implementing comprehensive safeguards in NNWS. In order to provide States party to an FMCT with a level of assurance analogous to the assurance provided by IAEA under comprehensive safeguards agreements, the verification system would have to apply to the entire declared fuel cycle in those States and should be geared to the detection of undeclared production facilities and of fissile material.

Any fissile material produced after the entry into force of an FMCT, either in fissile material production plants or through the operation of civil nuclear facilities, would presumably be subject to safeguards verification during processing, use and storage.

(Mr. Rauf, International Atomic Energy Agency)

To what extent States would be permitted to exempt from verification any existing fissile materials in their inventories, at the time of entry into force, would need to be discussed by States.

If the verification regime were to be strictly limited to the task of verifying the undertaking not to produce fissile material for purposes proscribed by an FMCT, it would not provide the assurance that existing stocks of fissile material to be used for the said purposes are not increased by means other than production (i.e. by declared and/or undeclared (illicit) imports of fissile material for use in nuclear weapons, or by use of existing civil stocks or military stocks for non-proscribed military purposes) after the entry into force of the FMCT.

Notwithstanding the fact that technically a comprehensive system of verification under an FMCT would appear to be the best alternative, States might opt for a less resource-intensive alternative, with a trade-off regarding the non-proliferation and disarmament benefits of a comprehensive approach against the reduced costs of more focused nuclear-facility-targeted approaches. States could, for example, constrain the technical objective of verification to the provision of assurance that all production facilities of direct-use material are either shut down or operated subject to verification, and that all stocks of fissile material not specifically excluded from verification once an FMCT enters into force would remain subject to verification.

Thus, some other alternatives with their specific resource requirements have been considered by the Agency. These alternatives are more limited in scope, and therefore less costly, but the level of assurance provided by these less resource-intensive alternatives would be significantly lower than the one given by the implementation of a verification system similar to safeguards in NNWS, unless of course the verification body were given the necessary authority and strong capabilities to look for undeclared activities and material.

And this is an important question: will the international verification regime include measures to detect undeclared nuclear facilities and material?

One challenge also might be that in some States, the military and the civilian nuclear fuel cycles are not entirely separated. Therefore verification arrangements, if they are to be agreed, will have to be devised in such a manner as to take account of such States' legitimate concerns regarding the protection of classified information without hampering verification requirements. Measures involving various degrees of intrusiveness could be considered, such as remote sensing, environmental sampling at a site or in its vicinity and managed-access inspections.

Some States might continue to use HEU for naval propulsion reactors or for fuelling tritium production reactors; verification that no HEU has been diverted to proscribed explosive uses would have to be addressed in such a way as to keep intrusiveness to an acceptable level, while concurrently enabling the verification agency to provide the appropriate level of assurance of compliance with the FMCT's provisions.

With regard to technical requirements, precise requirements are useful in creating and operating a verification system, as guides for budgeting, negotiation of specific implementation arrangements, staffing, routine inspection planning and evaluation, research and development,

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etc. The capabilities of a verification system can be specified in terms of measurement goals, i.e. amounts of fissile material of interest, time parameters during which the verification system should provide conclusions in relation to the amounts of fissile material, and the level of certainty desired about the conclusions.

These goals generally represent a balance between technical effectiveness and cost. As the specified amounts of fissile material to be measured decrease, as the timeliness increases, and as the confidence associated with conclusions increases, the verification costs commensurately go up and the level of assurance provided by the system increases.

With regard to an estimate of resources, the Agency has extensive data on verification costs for facilities currently subject to safeguards. However, in relation to an FMCT, estimates would be needed for facilities which are not currently subject to IAEA safeguards, those which have been or currently are part of national defence programmes in the NWS and in non-NPT States. It should be noted that the IAEA secretariat does not currently possess all the required information regarding such facilities, and this information would have to be provided by States once the treaty is concluded.

The secretariat's initial estimates are therefore based on information drawn largely from open literature and the Agency's expertise in carrying out safeguards implementation. Algorithms can be developed to compute the safeguards effort likely to be required based on relevant facility parameters, i.e. facility type, status, type and amount of nuclear material, location, etc.

Cost estimates prepared by the secretariat in 1995 relied on a database of 995 nuclear facilities, including decommissioned and shut-down facilities and facilities under construction, in eight States. Depending on the parameters, the costs of verifying an FMCT could vary between 50 and 150 million euros per year.

In conclusion, IAEA safeguards began in the 1960s and have continued to evolve, without pause, as new verification responsibilities were assigned, as peaceful nuclear operations increased in size and complexity and as international relations posed new challenges. At present, with a safeguards regular budget of $130 million supplemented by $16 million in extrabudgetary contributions, more than 250 IAEA inspectors carry out more than 2,100 inspections representing more than 9,000 person-days of inspection each year, using more than 100 different verification systems or technologies. As of 31 December 2005, Agency safeguards were applied to 930 facilities, including inter alia 240 power reactor units, 158 research reactors and critical assemblies, 13 enrichment plants, 7 reprocessing plants, some 90 tons of unirradiated plutonium outside reactor cores, 845 tons of plutonium contained in irradiated fuel, and nearly 30 tons of

(Mr. Rauf, International Atomic Energy Agency)

highly enriched uranium. The legal, technical and administrative arrangements adopted in different States and in different facilities respond to obligations mandated through safeguards agreements. In a wide range of areas, consideration of the existing safeguards arrangements might ensure that FMCT verification and IAEA safeguards are implemented in ways that provide the maximum value at the minimum cost.

It is the IAEA secretariat's assessment that verification of a treaty banning the production of fissile materials would be possible through a verification system quite similar to the one applied for the current IAEA safeguards system. The choice of a system to be developed to verify compliance with a fissile material production cut-off treaty is a matter for States to resolve. In this regard, States will have to address questions related to the different levels of assurance as well as the costs involved. The Agency stands ready to help in the process of further discussions and negotiations in whatever way is considered appropriate by States.

The PRESIDENT: On behalf of the Conference, I would like to thank Dr. Rauf for his excellent statement and comprehensive presentation. Our thanks also go to the Director General of the International Atomic Energy Agency, Dr. ElBaradei, for his positive response to the Conference's request for an expert presentation on issues related to the prohibition of the production of fissile material for nuclear weapons and other nuclear explosive devices.

I am confident that we have all benefited from this highly acknowledged expertise of Dr. Rauf and of the Agency itself in this field, as this presentation has helped us to better understand the complexities of this particular subject on the Conference agenda.

I will now suspend the plenary meeting, and in five minutes I will call the informal plenary meeting to order for questions, comments and discussion with Dr. Rauf and his colleague on the presentation. As usual this meeting will be open to members of the Conference and to observer States only.

The meeting was suspended at 11.25 a.m. and resumed at 12.50 p.m.

The PRESIDENT: I resume the 1037th plenary meeting of the Conference on Disarmament. The Conference will now continue its consideration of agenda item 7, entitled "Transparency in armaments", which was commenced yesterday.

I have the following speakers for today's plenary meeting: Australia, Ambassador Millar; the United Kingdom of Great Britain and Northern Ireland, Ms. Fiona Paterson; Turkey, Mr. Etensel; Pakistan, Ambassador Khan; Poland, Ambassador Rapacki; Switzerland, Mr. Fuls; France, Ambassador Rivasseau; the Netherlands, Ambassador Landman; Israel, Mr. Itzchaki.

It is our intention to proceed until 1 p.m. Then we will break and hold another plenary meeting at 3 p.m. this afternoon. So, without further delay, I will give the floor to the distinguished Ambassador of Australia.

Ms. MILLAR (Australia): Mr President, let me begin by saying how pleased we are to see Slovakia in the President's Chair. I welcome the energy you and your predecessors have brought to your tasks. And I can assure you of my delegation's full cooperation in your efforts to guide our work.

I wish to address an issue of vital significance to international security, namely, the prevention of the illicit transfer and unauthorized access to and use of man-portable air defence systems - MANPADS. As delegates will know, MANPADS are shoulder-launched missiles capable of targeting aircraft at considerable range and with deadly effect. MANPADS are a legitimate defensive weapon when developed, produced and used by States. Yet their illicit proliferation to terrorists and non-State actors is a significant threat to global civil aviation and international peacekeeping efforts. A MANPADS attack against civilian aircraft at a major airport would bring significant cost - in human life, disruption to air transport and financial impact. And this is not an idle threat, as arrests in Switzerland this year and some 600 MANPADS-related deaths since the 1970s show.

Encouragingly, many States are countering this threat. A recent seminar hosted by the Australian Permanent Mission highlighted a range of national, bilateral and international measures to combat MANPADS proliferation. Participants heard how effective launch denial strategies can reduce the risk of attack from areas close to the flight paths of major civilian airports; how one State's bilateral cooperation programme has secured and destroyed some 18,500 surplus MANPADS in 18 countries since 2003; and how better controls over intellectual property and originator licensing for re-export could help counter MANPADS proliferation.

The Australian delegation has prepared a summary of the seminar. I would be grateful if it could be distributed as an official document of the Conference. A key message of the seminar was the need for effective national controls over the production, storage and transfer of MANPADS. This need was recognized in two consecutive consensus United Nations General Assembly resolutions on MANPADS sponsored by Australia, Argentina, Kenya, Thailand and Turkey.

In the most recent of these resolutions, 60/77 of last year, the General Assembly encouraged States to enact or improve legislation, regulations, procedures and stockpile management practices to exercise effective control over MANPADS. States need to act on this resolution as a matter of urgency. To this end, Australia's Foreign Minister launched a major diplomatic initiative on MANPADS in December last year. Through this initiative, Australia is promoting the implementation of effective national controls over MANPADS in our region and beyond, including through our chairmanship of APEC in 2007. And we are identifying resource and assistance needs to help ensure that States are able to follow through on their political will and commitment to act. Australia will also host another international seminar in New York in November, to raise awareness of MANPADS and the need for States to take practical measures to address the threat posed by their illicit proliferation.

(Ms. Millar, Australia)

The Wassenaar Arrangement's "Elements for export controls of MANPADS" provide very good guidance for what States can do to ensure effective control over the export and storage of MANPADS. Measures in the Elements include maintaining inventories of weapons and their serial numbers, restricting access to MANPADS-relevant classified information and storing missiles and firing mechanisms separately. Moreover, exporting States are to satisfy themselves of a recipient State's willingness and ability to implement effective controls over MANPADS. The need for such a measure was highlighted in the Australian seminar, which noted the proliferation threat from poor stockpile management.

The Wassenaar Elements have secured widespread acknowledgement as the gold standard of MANPADS controls. The International Civil Aviation Organization, in resolution A35-11, urged all States to apply the principles defined in the Elements. The Elements have also received the support of APEC, the Organization for Security and Cooperation in Europe, the Organization of American States and the G-8. The implementation of measures such as the Elements can enhance the transparency of the trade in MANPADS, thereby enhancing international peace and security.

When Australia proposed MANPADS for discussion in the CD, it was with two major considerations in mind. First, in discussing and comparing the range of efforts against MANPADS proliferation, we hope that the CD will identify additional measures, whether national, bilateral, regional or multilateral, that States could take to counter this threat. States represented in this chamber have all recognized the need for such action through their support for the consensus United Nations General Assembly resolutions. Secondly, in discussing MANPADS, we see an opportunity for the CD to demonstrate that it is an institution capable of addressing the evolving global security environment and concerns of the international community.

The PRESIDENT: I thank the distinguished Ambassador of Australia for her statement and for the kind words addressed to the Chair. The next speaker on the list is the distinguished representative of the United Kingdom, Ms. Fiona Paterson.

Ms. PATERSON (United Kingdom of Great Britain and Northern Ireland): Mr. President, as this is the first time that my delegation is taking the floor under your presidency of the CD, allow me to congratulate you on the assumption of your responsibilities and to assure you of my delegation's continuing support and participation.

Allow me also to thank Vice Minister García Moritán for his excellent chairmanship of the GGE to the United Nations Register of Conventional Arms and for updating the Conference yesterday about the Group's progress. We hope this practice can be continued after the conclusion of future GGE meetings since it will greatly help us in our work on transparency.

The United Kingdom would like to make a short statement at this session on transparency in armaments, on the importance of effective control on the availability of man-portable air defence systems (MANPADS).

(Ms. Paterson, United Kingdom)

MANPADS present a particular threat if allowed to fall into the hands of undesirable end users. They are small, light, easily transportable and easy to conceal. Training is needed to use them. Yet terrorist groups possess these systems and have used them to target both military and civilian aircraft. Terrorists continue to seek to gain access to ever more sophisticated systems. And as long as there is leakage from existing stockpiles and diversion from the legitimate trade in these arms, terrorists will continue to acquire and use them.

The international community has begun making steady progress toward more effective control of these systems. In 2003 the Wassenaar Arrangement agreed the “Elements for export controls of man-portable air defence systems”. These “Elements” set out trading standards in a clear and usable way. They address key issues, including the need to only allow the transfer of MANPADS to “foreign governments or to agents specifically authorized to act on behalf of a government”; and it also includes the need to ensure that proposed recipients have the capacity to properly ensure secure handling without diversion.

The Wassenaar “Elements” contain clear provisions for the sharing of information on potential receiving governments that are proven to fail to meet the necessary standards in export control guarantees and practices, and non-State entities that are or may be attempting to acquire MANPADS. They also highlight the urgent need to ensure MANPADS are properly stored.

As my Australian colleague has already mentioned, these Elements are now seen as the key document, or the “gold standard”. Similar practices have now been adopted by an increasing number of regional groupings, and it is vital that we fully implement these standards - putting the need to ensure proper control of MANPADS above commercial considerations.

Out of a desire to support in a practical fashion the Wassenaar Elements, the United Kingdom has this year been working to further develop storage best practice. As a result of our work, the OSCE agreed to issue in March this year detailed guidance on “National procedures for stockpile management and security of man-portable air defence systems” as an annex to the OSCE “Handbook of best practice on small arms and light weapons”. I commend this guidance to all of you. If these arms are not stored properly, however stringent our export control systems, leakage will continue.

Before I conclude, I should like to express the United Kingdom’s appreciation for the work which Australia has conducted via their MANPADS initiative, both here in Geneva during the valuable seminar they arranged in June, and in support of the outreach efforts they are undertaking as the Chair of the Wassenaar Arrangement. The importance we attach to this work is endorsed at the highest level. At a meeting in Australia in March our Prime Ministers agreed “that the UK will actively support Australian efforts to encourage the wider international implementation of effective controls over the manufacture, storage and transfer of Man-Portable Air Defence Systems (MANPADS), including to prevent them being sold to non-State entities”.

And so the United Kingdom would like to call on all members of the CD to support ongoing work to spread, and effectively implement, the highest standards of control over these systems.

(Ms. Paterson, United Kingdom)

Similarly, also before concluding I would like to draw the attention of the Conference to other efforts in the field of transparency in armaments - that of the move towards an arms trade treaty (ATT) within the United Nations framework. Seven countries represented here - Argentina, Australia, Costa Rica, Finland, Japan, Kenya, the United Kingdom - have circulated a draft resolution on an ATT which we intend to table at the forthcoming First Committee of the United Nations General Assembly this October. We hope that authorities here will be able to support this important initiative.

The PRESIDENT: I thank the representative of the United Kingdom for her statement and for her kind words addressed to the Chair.

At this point I wish to adjourn this meeting. The next plenary meeting will be at 3 p.m. this afternoon in this conference room.

The meeting rose at 1 p.m.