DISARMAMENT AND VERIFICATION

Background paper prepared by the Secretariat

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Introduction

1. At its 27th meeting, on 8 February 1978, the Preparatory Committee for the Special Session of the General Assembly Devoted to Disarmament requested the Secretariat to prepare a background paper on the subject of verification. This decision followed the submission by Austria of working paper A/AC.187/101, in which it was pointed out, inter alia, that it was essential to have clarity in the discussion on verification in respect of any given disarmament agreement on the precise purposes of that verification. The working paper stated that "a first step in arriving at some agreed understanding on an approach to verification might be the presentation of a background paper prepared by the Secretariat which could help to pinpoint different problem areas and possible ways of approaching them". Austria, therefore, proposed that the Preparatory Committee entrust the Secretariat with the preparation of such a background paper.

2. The present paper is written in pursuance to the request of the Preparatory Committee. It identifies some aspects of verification in connexion with disarmament agreements on the basis of texts of existing agreements and of discussions and working papers on the subject. The paper is conceived as a brief, initial examination of the subject.

3. The decision whether and how provision for verification should be made in a given agreement on disarmament or arms limitation must be based on the scope of that agreement. The nature of the agreement sets the terms of reference for decisions concerning the kind and degree of verification to be provided for and for the examination of the technical requirements for verification as well as the means available to carry it out. An essential element in this decision-making process is the assessment by the prospective parties of the balance of benefits and risks involved in the conclusion of the agreement.

4. This paper addresses itself merely to the concept of verification and its use in agreements, without going into the political process referred to above. It recognizes that, since the choice of verification provisions will depend on the political context of the agreement concerned and the technical factors involved, such provisions may vary from one agreement to another. On the other hand, there are problems of a general and recurring nature.

5. In the preparation of this paper, use is made of texts of existing agreements in the field of disarmament and arms limitation, statements made during discussions in the framework of the United Nations, working papers and information on the application of verification measures, in particular the safeguards of the International Atomic Energy Agency. For ease of reference, relevant provisions in existing agreements are reproduced in part A of this paper.

6. The concept of verification is extremely complex. An effort has been made to clarify the subject by providing as much factual and background information as possible. No attempt has been made to draw conclusions from the facts or to suggest solutions.

7. The Secretariat will give the matter further consideration, as appropriate, within the limits of its own competence.
A. Existing agreements in the field of disarmament and arms limitation 1/

Provisions regarding verification

1. Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare (1925):

No provision for verification.


Article VII:

1. In order to promote the objectives and ensure the observance of the provisions of the present Treaty, each Contracting Party whose representatives are entitled to participate in the meetings referred to in Article IX of the Treaty shall have the right to designate observers to carry out any inspection provided for by the present Article. Observers shall be nationals of the Contracting Parties which designate them. The names of observers shall be communicated to every other Contracting Party having the right to designate observers, and like notice shall be given of the termination of their appointment.

2. Each observer designated in accordance with the provisions of paragraph 1 of this article shall have complete freedom of access at any time to any or all areas of Antarctica.

3. All areas of Antarctica, including all stations, installations and equipment within those areas, and all ships and aircraft at points of discharging or embarking cargoes or personnel in Antarctica, shall be open at all times to inspection by any observers designated in accordance with paragraph 1 of this Article.

4. Aerial observation may be carried out at any time over any or all areas of Antarctica by any of the Contracting Parties having the right to designate observers.

5. Each Contracting Party shall, at the time when the present Treaty enters into force for it, inform the other Contracting Parties, and thereafter shall give them notice in advance, of

(a) all expeditions to and within Antarctica, on the part of its ships or nationals, and all expeditions to Antarctica organized in or proceeding from its territory;

(b) all stations in Antarctica occupied by its nationals; and

1/ Agreements are listed in chronological order.
(c) any military personnel or equipment intended to be introduced by it into Antarctica subject to the conditions prescribed in paragraph 2 of Article I of the present Treaty.

Article IX, paragraph 1, provides that:

Representatives of the Contracting Parties named in the preamble to the present Treaty shall meet at the City of Canberra within two months after the date of entry into force of the Treaty, and thereafter at suitable intervals and places, for the purpose of exchanging information, consulting together on matters of common interest pertaining to Antarctica, and formulating and considering and recommending to their Governments, measures in furtherance of the principles and objectives of the Treaty, including measures regarding, inter alia, facilitation of the exercise of the rights of inspection provided for in Article VII of the Treaty.

3. Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water (1963): since it was envisaged that verification under this Treaty would be carried out by national means only, no provisions for verification were included in the text.

4. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (1967):

Article X:

In order to promote international co-operation in the exploration and use of outer space, including the moon and other celestial bodies, in conformity with the purposes of this Treaty, the States Parties to the Treaty shall consider on a basis of equality any requests by other States Parties to the Treaty to be afforded an opportunity to observe the flight of space objects launched by those States.

The nature of such an opportunity for observation and the conditions under which it could be afforded shall be determined by agreement between the States concerned.

Article XII:

All stations, installations, equipment and space vehicles on the moon and other celestial bodies shall be open to representatives of other States Parties to the Treaty on a basis of reciprocity. Such representatives shall give reasonable advance notice of a projected visit, in order that appropriate consultations may be held and that maximum precautions may be taken to assure safety and to avoid interference with normal operations in the facility to be visited.

Articles 12-16:

1. For the purpose of verifying compliance with the obligations entered into by the Contracting Parties in accordance with article 1, a control system shall be established which shall be put into effect in accordance with the provisions of articles 13-18 of this Treaty.

2. The control system shall be used in particular for the purpose of verifying:

(a) That devices, services and facilities intended for peaceful uses of nuclear energy are not used in the testing or manufacture of nuclear weapons,

(b) That none of the activities prohibited in article 1 of this Treaty are carried out in the territory of the Contracting Parties with nuclear materials or weapons introduced from abroad, and

(c) That explosions for peaceful purposes are compatible with article 18 of this Treaty.

Each Contracting Party shall negotiate multilateral or bilateral agreements with the International Atomic Energy Agency for the application of its safeguards to its nuclear activities. Each Contracting Party shall initiate negotiations within a period of 180 days after the date of the deposit of its instrument of ratification of this Treaty. These agreements shall enter into force, for each Party, not later than eighteen months after the date of the initiation of such negotiations except in case of unforeseen circumstances or force majeure.

1. The Contracting Parties shall submit to the Agency and to the International Atomic Energy Agency, for their information, semi-annual reports stating that no activity prohibited under this Treaty has occurred in their respective territories.

2. The Contracting Parties shall simultaneously transmit to the Agency a copy of any report they may submit to the International Atomic Energy Agency which relates to matters that are the subject of this Treaty and to the application of safeguards.

3. The Contracting Parties shall also transmit to the Organization of American States, for its information, any reports that may be of interest to it, in accordance with the obligations established by the Inter-American System.

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2/ Nineteen agreements for the application of safeguards pursuant to this Treaty are in force or being negotiated. These also cover the obligations of the States concerned under the NPT.
1. With the authorization of the Council, the General Secretary may request any of the Contracting Parties to provide the Agency with complementary or supplementary information regarding any event or circumstance connected with compliance with this Treaty, explaining his reasons. The Contracting Parties undertake to co-operate promptly and fully with the General Secretary.

2. The General Secretary shall inform the Council and the Contracting Parties forthwith of such requests and of the respective replies.

1. The International Atomic Energy Agency and the Council established by this Treaty have the power of carrying out special inspections in the following cases:

(a) In the case of the International Atomic Energy Agency, in accordance with the agreements referred to in article 13 of this Treaty;

(b) In the case of the Council:

(i) When so requested, the reasons for the request being stated, by any Party which suspects that some activity prohibited by this Treaty has been carried out or is about to be carried out, either in the territory of any other Party or in any other place on such latter Party's behalf, the Council shall immediately arrange for such an inspection in accordance with article 10, paragraph 5.

(ii) When requested by any Party which has been suspected of or charged with having violated this Treaty, the Council shall immediately arrange for the special inspection requested in accordance with article 10, paragraph 5.

The above requests will be made to the Council through the General Secretary.

2. The costs and expenses of any special inspection carried out under paragraph 1, sub-paragraph (b), sections (i) and (ii) of this article shall be borne by the requesting Party or Parties, except where the Council concludes on the basis of the report on the special inspection that, in view of the circumstances existing in the case, such costs and expenses should be borne by the Agency.

3. The General Conference shall formulate the procedures for the organization and execution of the special inspections carried out in accordance with paragraph 1, sub-paragraph (b), sections (i) and (ii) of this article.

4. The Contracting Parties undertake to grant the inspectors carrying out such special inspections full and free access to all places and all information which may be necessary for the performance of their duties and
which are directly and intimately connected with the suspicion of violation of this Treaty. If so requested by the authorities of the Contracting Party in whose territory the inspection is carried out, the inspectors designated by the General Conference shall be accompanied by representatives of said authorities, provided that this does not in any way delay or hinder the work of the inspectors.

5. The Council shall immediately transmit to all the Parties, through the General Secretary, a copy of any report resulting from special inspections.

6. Similarly, the Council shall send through the General Secretary to the Secretary-General of the United Nations, for transmission to the United Nations Security Council and General Assembly, and to the Council of the Organization of American States, for its information, a copy of any report resulting from any special inspection carried out in accordance with paragraph 1, sub-paragraph (b), sections (i) and (ii) of this article.

7. The Council may decide, or any Contracting Party may request, the convening of a special session of the General Conference for the purpose of considering the reports resulting from any special inspection. In such a case, the General Secretary shall take immediate steps to convene the special session requested.

8. The General Conference, convened in special session under this article, may make recommendations to the Contracting Parties and submit reports to the Secretary-General of the United Nations to be transmitted to the United Nations Security Council and the General Assembly.

Article 20:

1. The General Conference shall take note of all cases in which, in its opinion, any Contracting Party is not complying fully with its obligations under this Treaty and shall draw the matter to the attention of the Party concerned, making such recommendations as it deems appropriate.

2. If, in its opinion, such non-compliance constitutes a violation of this Treaty, which might endanger peace and security, the General Conference shall report thereon simultaneously to the United Nations Security Council and the General Assembly through the Secretary-General of the United Nations, and to the Council of the Organization of American States. The General Conference shall likewise report to the International Atomic Energy Agency for such purposes as are relevant in accordance with its Statute.


3/ By end 1977, 54 agreements for the application of safeguards pursuant to the NPT were in force. The text which forms the basis for all these agreements is contained in IAEA document INFCIRC/153.
Article III:

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

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

3. The safeguards required by this article shall be implemented in a manner designed to comply with article IV of this Treaty, and to avoid hampering the economic or technological development of the Parties or international co-operation in the field of peaceful nuclear activities, including the international exchange of nuclear material and equipment for the processing, use or production of nuclear material for peaceful purposes in accordance with the provisions of this article and the principle of safeguarding set forth in the Preamble of the Treaty.

4. Non-nuclear-weapon States Party to the Treaty shall conclude agreements with the International Atomic Energy Agency to meet the requirements of this article either individually or together with other States in accordance with the Statute of the International Atomic Energy Agency. Negotiation of such agreements shall commence within 180 days from the original entry into force of this Treaty. For States depositing their instruments of ratification or accession after the 180-day period, negotiation of such agreements shall commence not later than the date of such deposit. Such agreements shall enter into force not later than eighteen months after the date of initiation of negotiations.


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Article III:

1. In order to promote the objectives of and insure compliance with the provisions of this Treaty, each State Party to the Treaty shall have the right to verify through observation the activities of other States Parties to the Treaty on the sea-bed and the ocean floor and in the subsoil thereof beyond the zone referred to in article I, provided that observation does not interfere with such activities.

2. If after such observation reasonable doubts remain concerning the fulfilment of the obligations assumed under the Treaty, the State Party having such doubts and the State Party that is responsible for the activities giving rise to the doubts shall consult with a view to removing the doubts. If the doubts persist, the State Party having such doubts shall notify the other States Parties, and the Parties concerned shall co-operate on such further procedures for verification as may be agreed, including appropriate inspection of objects, structures, installations or other facilities that reasonably may be expected to be of a kind described in article I. The Parties in the region of the activities, including any coastal State, and any other Party so requesting, shall be entitled to participate in such consultation and co-operation. After completion of the further procedures for verification, an appropriate report shall be circulated to other Parties by the Party that initiated such procedures.

3. If the State responsible for the activities giving rise to the reasonable doubts is not identifiable by observation of the object, structure, installation or other facility, the State Party having such doubts shall notify and make appropriate inquiries of States Parties in the region of the activities and of any other State Party. If it is ascertained through these inquiries that a particular State Party is responsible for the activities, that State Party shall consult and co-operate with other Parties as provided in paragraph 2 of this article. If the identity of the State responsible for the activities cannot be ascertained through these inquiries, then further verification procedures, including inspection, may be undertaken by the inquiring State Party, which shall invite the participation of the Parties in the region of the activities, including any coastal State, and of any other Party desiring to co-operate.

4. If consultation and co-operation pursuant to paragraphs 2 and 3 of this article have not removed the doubts concerning the activities and there remains a serious question concerning fulfilment of the obligations assumed under this Treaty, a State Party may, in accordance with the provisions of the Charter of the United Nations, refer the matter to the Security Council, which may take action in accordance with the Charter.

5. Verification pursuant to this article may be undertaken by any State Party using its own means, or with the full or partial assistance of any other State Party, or through appropriate international procedures within the framework of the United Nations and in accordance with its Charter.

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6. Verification activities pursuant to this Treaty shall not interfere with activities of other States Parties and shall be conducted with due regard for rights recognized under international law, including the freedoms of the high seas and the rights of coastal States with respect to the exploration and exploitation of their continental shelves.

8. Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction (1972):

Article V:

The States Parties to this Convention undertake to consult one another and to co-operate in solving any problems which may arise in relation to the objective of, or in the application of the provisions of, the Convention. Consultation and co-operation pursuant to this article may also be undertaken through appropriate international procedures within the framework of the United Nations and in accordance with its Charter.

Article VI:

1. Any State Party to this Convention which finds that any other State Party is acting in breach of obligations deriving from the provisions of the Convention may lodge a complaint with the Security Council of the United Nations. Such a complaint should include all possible evidence confirming its validity, as well as a request for its consideration by the Security Council.

2. Each State Party to this Convention undertakes to co-operate in carrying out any investigation which the Security Council may initiate, in accordance with the provisions of the Charter of the United Nations, on the basis of the complaint received by the Council. The Security Council shall inform the States Parties to the Convention of the results of the investigation.


Article XII:

1. For the purpose of providing assurance of compliance with the provisions of this Treaty, each Party shall use national technical means of verification at its disposal in a manner consistent with generally recognized principles of international law.

2. Each Party undertakes not to interfere with the national technical means of verification of the other Party operating in accordance with paragraph 1 of this Article.

/...
3. Each Party undertakes not to use deliberate concealment measures which impede verification by national technical means of compliance with the provisions of this Treaty. This obligation shall not require changes in current construction, assembly, conversion, or overhaul practices.

Article XIII, paragraph 1, provides that:

1. To promote the objectives and implementation of the provisions of this Treaty, the Parties shall establish promptly a Standing Consultative Commission, within the framework of which they will, inter alia,

(a) consider questions concerning compliance with the obligations assumed and related situations which may be considered ambiguous;

(b) provide on a voluntary basis such information as either Party considers necessary to assure confidence in compliance with the obligations assumed;

(c) consider questions involving unintended interference with national technical means of verification;


Article II:

1. For the purpose of providing assurance of compliance with the provisions of this Treaty, each Party shall use national technical means of verification at its disposal in a manner consistent with the generally recognized principles of international law.

2. Each Party undertakes not to interfere with the national technical means of verification of the other Party operating in accordance with paragraph 1 of this Article.

3. To promote the objectives and implementation of the provisions of this Treaty the Parties shall, as necessary, consult with each other, make inquiries and furnish information in response to such inquiries.


Article IV:

1. For the purpose of providing assurance of compliance with the provisions of this Treaty, each Party shall:

(a) use national technical means of verification at its disposal in a manner consistent with generally recognized principles of international law; and
(b) provide to the other Party information and access to sites of explosions and furnish assistance in accordance with the provisions set forth in the Protocol to this Treaty.

2. Each Party undertakes not to interfere with the national technical means of verification of the other Party operating in accordance with paragraph 1(a) of this article, or with the implementation of the provisions of paragraph 1(b) of this article.

Article V:

1. To promote the objectives and implementation of the provisions of this Treaty, the Parties shall establish promptly a Joint Consultative Commission within the framework of which they will:

(a) consult with each other, make inquiries and furnish information in response to such inquiries, to assure confidence in compliance with the obligations assumed;

(b) consider questions concerning compliance with the obligations assumed and related situations which may be considered ambiguous;

(c) consider questions involving unintended interference with the means for assuring compliance with the provisions of this Treaty;

(d) consider changes in technology or other new circumstances which have a bearing on the provisions of this Treaty; and

(e) consider possible amendments to provisions governing underground nuclear explosions for peaceful purposes.

2. The Parties through consultation shall establish, and may amend as appropriate, Regulations for the Joint Consultative Commission governing procedures, composition and other relevant matters.

The protocol spells out the procedures to be followed during the observation process, including such specifics as the number of observers, the geographical extent of their access, and the provision of certain information such as maps of the area of the explosion, to assist in the planning of their activities. In addition, the protocol provides for certain necessary privileges and immunities to be granted to observer personnel and their equipment, and for housing and working facilities to assure their freedom to carry out their rights and functions effectively.


Article V:

1. The States Parties to this Convention undertake to consult one another and to co-operate in solving any problems which may arise
in relation to the objectives of, or in the application of the provisions of, the Convention. Consultation and co-operation pursuant to this article may also be undertaken through appropriate international procedures within the framework of the United Nations and in accordance with its Charter. These international procedures may include the services of appropriate international organizations, as well as of a consultative committee of experts as provided for in paragraph 2 of this article.

2. For the purposes set forth in paragraph 1 of this article, the Depositary shall, within one month of the receipt of a request from any State Party, convene a consultative committee of experts. Any State Party may appoint an expert to this committee whose functions and rules of procedure are set out in the annex, which constitutes an integral part of this Convention. The committee shall transmit to the Depositary a summary of its findings of fact, incorporating all views and information presented to the committee during its proceedings. The Depositary shall distribute the summary to all States Parties.

3. Any State Party to this Convention which has reasons to believe that any other State Party is acting in breach of obligations deriving from the provisions of the Convention may lodge a complaint with the Security Council of the United Nations. Such a complaint should include all relevant information as well as all possible evidence supporting its validity.

4. Each State Party to this Convention undertakes to co-operate in carrying out any investigation which the Security Council may initiate, in accordance with the provisions of the Charter of the United Nations, on the basis of the complaint received by the Council. The Security Council shall inform the States Parties to the Convention of the results of the investigation.

5. Each State Party to this Convention undertakes to provide or support assistance, in accordance with the provisions of the Charter of the United Nations, to any Party to the Convention which so requests, if the Security Council decides that such Party has been harmed or is likely to be harmed as a result of violation of the Convention.

Annex to the Convention:

1. The Consultative Committee of Experts shall undertake to make appropriate findings of fact and provide expert views relevant to any problem raised pursuant to paragraph 1 of article V of this Convention by the State Party requesting the convening of the Committee.

2. The work of the Consultative Committee of Experts shall be organized in such a way as to permit it to perform the functions set forth in paragraph 1 of this annex. The Committee shall decide procedural questions relative to the organization of its work, where possible by consensus, but otherwise by a majority of those present and voting. There shall be no voting on matters of substance.
3. The Depositary or his representative shall serve as the Chairman of the Committee.

4. Each expert may be assisted at meetings by one or more advisers.

5. Each expert shall have the right, through the Chairman, to request from States, and from international organizations, such information and assistance as the expert considers desirable for the accomplishment of the Committee's work.
B. Some aspects of verification

13. Verification as discussed in this paper is the process of ascertaining that a commitment laid down in a particular agreement in the field of disarmament or arms limitation is being met. Thus, verification may comprise several steps, including the gathering of information, the checking of records, inspection to assure that the actual situation corresponds to the information obtained, the examination and evaluation of the information gathered and a determination about compliance. Verification, therefore, is a process of gathering and analysing information, permitting a conclusion.

14. The international discussions and negotiations reveal various opinions about the purposes of verification. An analysis of statements made on the subject in international deliberations would, however, seem to justify the conclusion that all approaches to the concept of verification share the view that its basic purpose is to serve as a factor in making the initial and continued adherence of States to a disarmament agreement possible, by ascertaining compliance with the agreement and giving assurances to that end.

Depending on the nature of the agreement, one or another aspect of this basic purpose may be emphasized as follows:

(a) The protection of the security of the Parties to the agreement.

Example: it has been stated that "the essential aim of verification (is) to obtain assurance that, notwithstanding the restriction or limitation to be adopted, national security would not be jeopardized by a significant but unnoticed and, therefore, unilaterally advantageous breach of the agreement by other parties". 4/

(b) The deterrent aspect of verification.

Example: in the agreements concluded by the IAEA for the application of safeguards in connexion with the NPT, the objective of such safeguards is described, in part, as the deterrence of diversion of significant quantities of nuclear material by the risk of early detection. 5/

(c) The ability to evoke a response in the case of non-compliance.

Example: the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, provides in Article VI, that a Party


5/ See IAEA document INFCIRC/153, para. 28. This aspect of verification was specifically stressed by the representative of the United States of America in the CCD on 2 August 1973. See CCD/PV.610, p. 6.
which finds that another Party is acting in breach of its obligations under the Convention may lodge a complaint with the Security Council. 6/

(d) The ability of States to demonstrate their own compliance to the agreement.

Example: a provision to meet this specific purpose is made in the Treaty for the Prohibition of Nuclear Weapons in Latin America (Tlatelolco Treaty). Article 16, para. 1 (b) (ii) provides that special inspections shall be made upon the request by any Party which has been suspected of or charged with having violated the treaty.

These approaches are largely interrelated.

15. The objective of verification is the event or situation of which it is intended to ascertain either the occurrence or existence or, conversely, the non-occurrence or non-existence. This objective which determines the technical parameters of the verification is directly related to the scope of the agreement providing for the verification. In order to ensure that the verification system adopted is appropriate to the objective of the verification, this objective should be clear from the relevant disarmament agreement or from the agreements concluded pursuant to it to specify the verification measures to be applied.

Examples:

The objective of the safeguards applied pursuant to the Treaty on the Non-Proliferation of Nuclear Weapons is the timely detection of diversion of significant quantities of nuclear material from peaceful nuclear activities to the manufacture of nuclear weapons or of other nuclear explosive devices or for purposes unknown. 7/

The Treaty for the Prohibition of Nuclear Weapons in Latin America provides in article 16, para. 1 (b) (i), that a Party which suspects that some activity prohibited by the Treaty has been carried out or is about to be carried out may ask for a special inspection. In the case of such a request, the objective of the special inspection would have to be specified.

In the case of an agreement providing for the destruction of stockpiles of weapons or weapon components, the objective of the verification might be to ascertain that this destruction has actually been or is being carried out.

In an agreement prohibiting the production of particular weapons or weapon components, the objective of the verification might be to ensure that such

6/ The Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (ENMOD) contains a similar provision. See also the Treaty on the Prohibition of the Emplacement of Nuclear Weapons and Other Weapons of Mass Destruction on the Seabed and the Ocean Floor and in the Subsoil Thereof (Sea-Bed Treaty), art. III (4).

items are not being produced in installations declared to be intended for other purposes.

16. Texts of various agreements in the field of disarmament and arms limitation, as well as the international discussions and the published literature, employ a variety of terms which, for ease of reference are subsumed in this paper under the general heading of "verification". Among these are "monitoring", 8/ "inspection", 9/ "on-site inspection", 10/ "on-site ascertaining of relevant circumstances", 11/ "control", 12/ "oversee the working", 13/ "make appropriate findings of fact" 14/ and "investigations". 15/ The terminology employed in various contexts denote different modes and degrees of verification. The terms would all seem to contain the elements of information gathering, analysis and the determination of compliance, which are the essential components of verification.

17. As indicated in paragraphs 3 and 4 of the Introduction to this paper, decisions on the means of the verification to be adopted are taken within the over-all context of the particular agreement under discussion. The means of verification chosen will depend both on the scope and nature of the agreement and on technological factors. Depending on the conditions agreed upon the application of verification may take place wherever technical means permit meaningful information to be gathered. It may be applied outside the State concerned (extraterritorially), including from outer space. It may also take place within the territory of the State in question, at various agreed locations, including sites where certain weapons or materials are disposed of, at production sites, or at other specifically agreed locales.

8/ See working paper of the USSR on "Some methods of monitoring compliance with an agreement on the prohibition of chemical weapons", CCD/530, 3 August 1977.

9/ Joint Statement by the USSR and the United States of America in document A/4879 and Antarctic Treaty, art. VII.

10/ Draft programme of action for the special session of the General Assembly devoted to disarmament, submitted by Australia, Belgium, Canada, Denmark, the Federal Republic of Germany, Italy, Japan, the Netherlands, Norway, the United Kingdom, A/AC.187/96, 1 February 1976.

11/ Memorandum by the USSR on questions of ending the arms race and disarmament, A/31/232, 28 September 1976.

12/ Draft treaty on general and complete disarmament under strict international control, submitted by the USSR, EMDC/2/Rev.1/Add.1, 15 March 1962.

13/ United Kingdom draft convention on the prohibition of the development, production and stockpiling of chemical weapons and on their destruction, CCD/512, 6 August 1976.

14/ See the annex to the Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques.

15/ Ibid., art. V.4.
Verification may be a one-time exercise carried out, for instance, with the objective of ascertaining that stocks of a particular material or certain weapons have been destroyed or disposed of. It may also be an ongoing process, to ensure that a particular industrial activity is not used in a proscribed manner or for purposes unknown. It may be a combination of these two activities, in that, after the fulfilment of an obligation to dispose of stocks of specified items has been verified, there is continuing verification that no new stocks of such items are created.

The means of verification adopted to meet the objective of that verification may be chosen, depending on the specific case at hand, from a wide range of possibilities. In the area of information gathering, verification may comprise, for example, the submission of reports or of other relevant data, specifically prepared for the purpose or available in published form. Information may also be collected at first hand through various modes of inspection, including optical surveillance and other technical methods, applied on-site or at a distance. Inspection may also involve, for instance, examination and auditing of records and stocks, measurements, sampling, the use of seals to contain a given situation and make sure that no unrecorded movements take place of the items covered by the verification, and the use of various on- and off-site monitoring devices. The analysis of the information gathered by such means and the subsequent evaluation of the data analysed are indispensable elements in the process of verification, leading to a determination on compliance.

18. Verification may be applied through national or international means or by a combination of both. The term verification by national means has been used to denote a system whereby national authorities collect and digest information on activities carried out, in their own country, and present such information to other Parties to the agreement, directly or through an international organization. The term is also used in connexion with verification systems under which one State uses its means to verify occurrences or situations in another State. These two uses of the same term should be clearly distinguished. International verification is most generally used when States together or through an appropriate international framework ascertain events or occurrences in the context of a given agreement within the territory of one or more States. Under a mixed system of verification an international organization may make use of the findings of a national authority made available to it, while also carrying out some degree of verification itself.

19. In deliberations on the subject of verification, various requirements have

16/ Treaty between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Anti-Ballistic Missile Systems, art. XII. See also the Treaty between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Underground Nuclear-Weapon Tests, art. II.

17/ See Treaty for the Prohibition of Nuclear Weapons in Latin America, art. 12.

18/ See for instance IAEA safeguards in connexion with the NPT, document INFCIRC/153, para. 7.

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been advanced, both in regard to its adequacy and to its acceptability. For example, the Commission for Conventional Armaments mentioned, in 1948, that, besides being technically feasible and practical, verification should be capable of detecting promptly the occurrence of violations and should cause the minimum interference with, and impose the minimum burden on any aspect of life of individual nations. 19/ The requirement of adequacy of verification is reflected in the use of such qualifying adjectives as "strict", "effective", "necessary", "valid" and "most thorough", in addition to "adequate" itself. 20/ These qualifications, as may be seen from present discussions regarding the safeguards applied pursuant to the NPT, may refer both to the verification system itself and to the way in which it is applied. No matter how strict the system as provided for in or pursuant to a measure of disarmament or arms regulation, its effectiveness will largely depend on the adequacy of its application. Periodic review may be desired for this purpose and provision therefore may be included in the agreements concerned. 21/ The following remarks pertain to the adequacy of the verification provisions rather than to their application. The term "adequacy" as used here covers such other terms as "effective", "strict" and "thorough".

The use of the term "adequacy" in respect of the system of verification provided is taken to mean that this system should meet an agreed standard. This standard would then be determined on the basis of agreement on the technical objective to be met by the verification and the means parties consider it appropriate to provide for this purpose. Thus, consideration of the concept of adequacy will involve political as well as technical factors, and also financial ones.

In cases of agreements (for instance, those prohibiting particular uses of certain substances or calling for the destruction or disposal of specified numbers of items or quantities of materials) a purely technical decision regarding adequacy would presume the objective of the verification to be precisely quantifiable. Thus, in the system of nuclear safeguards designed to detect diversion of "significant quantities" of nuclear material, 22/ the objective


20/ See, for instance the joint statement by the USSR and the United States of America, the USSR Draft treaty on general and complete disarmament in ENDC/2/Rev.1/Add.1, Outline of basic provisions of a treaty on general and complete disarmament in a peaceful world, submitted by the United States, ENDC/30/Add.3, 18 April 1962; Comprehensive programme of disarmament submitted by Ireland, et al., A/8191; Non-aligned working document containing the draft declaration, programme of action and machinery for implementation, for the special session of the General Assembly devoted to disarmament, A/AC.187/55/Add.1, 24 January 1978; Working paper A/AC.187/96 (see foot-note 8) and the working paper of France, A/AC.187/90, 26 January 1978.

21/ CCD/400, para. 15.

22/ See IAEA document INFCIRC/153, para. 28.
requires the quantity considered significant to be specified and the means of verification should be such as to permit at a given moment, a statement at a predetermined level of confidence, that no more than that quantity has been diverted, taking into account a certain limit of error. This quantity would be established in the light of the technical parameters.

It may not always be possible, however, to quantify a situation entirely on the basis of technical factors. Even so, it might be desirable for the purpose of reaching defensible conclusions to establish to the extent possible the confidence level that may be achieved by the verification, i.e. the degree of confidence with which it is able to make a statement as to whether an act of non-compliance has taken place. Such a determination would involve a judgement of the amount and kind of assurance verification should generate (acceptable risks), the technical complexity of the situation to be verified and the means available for verification. 23/

Although this choice would presumably depend on the specific measure under discussion, more thorough study may lead to an enumeration of the factors that will have to be taken into account in the adoption of the verification means. Such consideration might also cover the question of cost effectiveness, i.e., the relationship between the probable effect of a given verification measure and its costs. The question whether a given verification activity is warranted from the point of view of cost effectiveness may also be considered in the light of the relative importance of the disarmament measure involved and, therefore, of the risk that parties are willing to accept. This question also requires thorough analysis.

The question of avoiding interference, which is an aspect of the "acceptability" requirement, has been the subject of much discussion, in connexion with the NPT. The standard agreements concluded by the IAEA for the application of safeguards pursuant to that treaty 24/ as well as in other contexts, 25/ contain provisions limiting the intrusiveness of that kind of verification. IAEA experience shows that where verification measures demand active co-operation by industrial personnel and involve the presence of outside inspectors, on-site verification should be so applied as to reduce interference to the minimum necessary to achieve the objective.

23/ This concept was discussed by the representative of the United States of America in the CCD, who gave as one criteria for adequacy of verification its ability to detect a "significant violation". See CCD/PV.502, p. 22, 13 March 1971; the representative of Argentina to the CCD has stated that a verification system need not be perfect, i.e., offer 100 per cent certainty, but should, to be adequate, offer "reasonable certainty" that the obligation assumed would be fulfilled. CCD/PV.576, pp. 11 and 12, 10 August 1972; see also a further statement by the United States representative, on 24 August 1972, referring to an "acceptable level of risk", CCD/PV.580, p. 33; see also a statement by the representative of Sweden on 8 March 1973 pointing out that no verification system can give an absolute guarantee that every violation will be detected, CCD/PV.590, p. 10.

24/ See INFCIRC/153, para. 4.

25/ See INFCIRC/66, paras. 9-11.
Within this minimum, however, the verifying body should have the authority to carry out the verification measures agreed upon.

20. The texts of various agreements and the discussions on the subject show various approaches to the function of verification in respect of the response that may be given to a finding of non-compliance. To a large extent, these approaches are connected with the emphasis laid on one or the other aspects of the purpose of verification. Thus, for example, such a finding might lead to:

(a) Withdrawal, termination or denunciation of the agreement.

A number of agreements provide for the right of a party to withdraw if the party decides that "extraordinary events related to the subject-matter of (the) Treaty, have jeopardized the supreme interests of its country". 28 /

(b) International action.

In connexion, for instance, with IAEA safeguard agreements, which provide for reports on non-compliance to be transmitted, inter alia, to the Security Council, in accordance with article XII of the Agency's statute, increasing attention is being given to the question of other international action that might be taken in response to a violation of such an agreement. 29 /

(c) The loss of treaty benefits.

The function is connected with the one discussed under the previous point. Sanctions, in the form of curtailment or suspension of nuclear supplies may be applied pursuant to the statute of the IAEA in the case of non-compliance with certain safeguards agreements. 30 /

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26/ See, for instance, Treaty for the Prohibition of Nuclear Weapons in Latin America, art. 16, para. 4, and joint statement by the USSR and the United States of America in document A/4879.

27/ See para. 14 above.

28/ See NPT, art. 7, Sea-bed Treaty, art. VIII, Biological Weapons Convention, art. VIII. Under art. 30 of the Tlatelolco Treaty, any party may denounce the treaty if in its opinion there have arisen or may arise circumstances connected with the content of the treaty or its protocols which affect the State's supreme interests or the peace and security of one or more contracting parties.

29/ See, for instance, statement by the USSR during the twenty-first regular session of the IAEA, General Conference (XXI)/OR.194.

30/ IAEA statute, art. XIII, para. c.
In addition, if it were found that one party to an agreement did not comply with the undertaking, it could be imagined that other parties would consider acting similarly. For example, if a State were found in default of its obligation to destroy stocks of a certain material, other States might also stop destroying their stocks of such material. In this respect, verification might be viewed as a means to trigger counteraction.

21. There are many ways in which technology may have an impact on verification. Thus, while the technical nature of the items or processes subject to the verification may help determine the means and mode of verification, the technology available for the verification may in its turn be an important factor. Technological considerations are likely to vary from case to case and would seem to require specific consideration in respect of each instance on the basis of technical competence relating thereto.

Verification may involve the use of technical devices to yield or check information. Such devices might range from simple seals or cameras to remote sensing devices in orbiting satellites. The IAEA has provision in its 1978 budget of $791,000 for "scientific supplies and equipment" for safeguards, including the purchase of various inspection devices and $780,000 is earmarked for "laboratory services", including the analysis of safeguards samples. 31/ While the safeguards devices the IAEA is using are still relatively simple and cheap, and its analytical programme is limited in size, and the amounts involved may, therefore, not be indicative of the costs of more complicated verification schemes, they might provide some basis of comparison for the cost that might be involved in such other schemes.

31/ See IAEA document GC(XXI)/582, table K.1.