CONFERENCE ON DISARMAMENT

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REPORT OF THE CONFERENCE ON DISARMAMENT

APPENDIX I

VOLUME IV

Texts of documents issued by the

Conference on Disarmament

GE.91-62861

CONFERENCE ON DISARMAMENT

CD/1067
8 March 1991

Original: ENGLISH

LETTER DATED 28 FEBRUARY 1991 FROM THE REPRESENTATIVE OF THE UNITED STATES OF AMERICA ADDRESSED TO THE PRESIDENT OF THE CONFERENCE ON DISARMAMENT TRANSMITTING THE TEXT OF THE 1976 TREATY BETWEEN THE UNITED STATES OF AMERICA AND THE UNION OF SOVIET SOCIALIST REPUBLICS ON UNDERGROUND NUCLEAR EXPLOSIONS FOR PEACEFUL PURPOSES, TOGETHER WITH ITS PROTOCOL */

I have the honour to forward to you the 1976 Treaty between the United States of America and the Union of Soviet Socialist Republics on Underground Nuclear Explosions for Peaceful Purposes, together with its Protocol, which entered into force following the exchange of instruments of ratification on 11 December 1990.

In accordance with the past practice, Minister Batsanov, USSR Representative to the Conference on Disarmament, will transmit these documents in Russian to the Conference on Disarmament.

I ask that you take the appropriate steps to issue this treaty text as an official document of the Conference on Disarmament and have it distributed to all member delegations and non-member States participating in the work of the Conference.

(Signed) Stephen J. Ledogar
Representative of the
United States of America
to the Conference on
Disarmament

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*/ The official Russian text of the above-mentioned Treaty together with its Protocol is to be found in CD/1069.

GE.91-60497/5744a

Treaty Between the United States of America and the Union of Soviet Socialist Republics on Underground Nuclear Explosions for Peaceful Purposes

Signed at Washington and Moscow May 28, 1976

The United States of America and the Union of Soviet Socialist Republics, hereinafter referred to as the Parties,

Proceeding from a desire to implement Article III of the Treaty between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Underground Nuclear Weapon Tests, which calls for the earliest possible conclusion of an agreement on underground nuclear explosions for peaceful purposes,

Reaffirming their adherence to the objectives and principles of the Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water, the Treaty on Non-Proliferation of Nuclear Weapons, and the Treaty on the Limitation of Underground Nuclear Weapon Tests, and their determination to observe strictly the provisions of these international agreements,

Desiring to assure that underground nuclear explosions for peaceful purposes shall not be used for purposes related to nuclear weapons,

Desiring that utilization of nuclear energy be directed only toward peaceful purposes,

Desiring to develop appropriately cooperation in the field of underground nuclear explosions for peaceful purposes,

Have agreed as follows:

Article I

1. The Parties enter into this Treaty to satisfy the obligations in Article III of the Treaty on the Limitation of Underground Nuclear Weapon Tests, and assume additional obligations in accordance with the provisions of this Treaty.

2. This Treaty shall govern all underground nuclear explosions for peaceful purposes conducted by the Parties after March 31, 1976.

Article II

For the purposes of this Treaty:

(a) "explosion" means any individual or group underground nuclear explosion for peaceful purposes;

(b) "explosive" means any device, mechanism or system for producing an individual explosion;

(c) "group explosion" means two or more individual explosions for which the time interval between successive individual explosions does not exceed five seconds and for which the emplacement points of all explosives can be interconnected by straight line segments, each of which joins two emplacement points and each of which does not exceed 40 kilometers.

Article III

1. Each Party, subject to the obligations assumed under this Treaty and other international agreements, reserves the right to:

(a) carry out explosions at any place under its jurisdiction or control outside the geographical boundaries of test sites specified under the provisions of the Treaty on the Limitation of Underground Nuclear Weapon Tests; and

(b) carry out, participate or assist in carrying out explosions in the territory of another State at the request of such other State.

2. Each Party undertakes to prohibit, to prevent and not to carry out at any place under its jurisdiction or control, and further undertakes not to carry out, participate or assist in carrying out anywhere:

(a) any individual explosion having a yield exceeding 150 kilotons;

(b) any group explosion:

(1) having an aggregate yield exceeding 150 kilotons except in ways that will permit identification of each individual explosion and determination of the yield of each individual explosion in the group in accordance with the provisions of Article IV of and the Protocol to this Treaty;

(2) having an aggregate yield exceeding one and one-half megatons;

(c) any explosion which does not carry out a peaceful application;

(d) any explosion except in compliance with the provisions of the Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water, the Treaty on the Non-Proliferation of Nuclear Weapons, and other international agreements entered into by that Party.

3. The question of carrying out any individual explosion having a yield exceeding the yield specified in paragraph 2(a) of this article will be considered by the Parties at an appropriate time to be agreed.

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.

Article VI

1. The Parties will develop cooperation on the basis of mutual benefit, equality, and reciprocity in various areas related to carrying out underground nuclear explosions for peaceful purposes.

2. The Joint Consultative Commission will facilitate this cooperation by considering specific areas and forms of cooperation which shall be determined by agreement between the Parties in accordance with their constitutional procedures.

3. The Parties will appropriately inform the International Atomic Energy Agency of results of their cooperation in the field of underground nuclear explosions for peaceful purposes.

Article VII

1. Each Party shall continue to promote the development of the international agreement or agreements and procedures provided for in Article V of the Treaty on the Non-Proliferation of Nuclear Weapons, and shall provide appropriate assistance to the International Atomic Energy Agency in this regard.

2. Each Party undertakes not to carry out, participate or assist in the carrying out of any explosion in the territory of another State unless that State agrees to the implementation in its territory of the international observation and procedures contemplated by Article V of the Treaty on the Non-Proliferation of Nuclear Weapons and the provisions of Article IV of and the Protocol to this Treaty, including the provision by that State of the assistance necessary for such implementation and of the privileges and immunities specified in the Protocol.

Article VIII

1. This Treaty shall remain in force for a period of five years, and it shall be extended for successive five-year periods unless either Party notifies the other of its termination no later than six months prior to its expiration. Before the expiration of this period the Parties may, as necessary, hold consultations to consider the situation relevant to the substance of this Treaty. However, under no circumstances shall either Party be entitled to terminate this Treaty while the Treaty on the Limitation of Underground Nuclear Weapon Tests remains in force.

2. Termination of the Treaty on the Limitation of Underground Nuclear Weapon Tests shall entitle either Party to withdraw from this Treaty at any time.

3. Each Party may propose amendments to this Treaty. Amendments shall enter into force on the day of the exchange of instruments of ratification of such amendments.

Article IX

1. This Treaty including the Protocol which forms an integral part hereof, shall be subject to ratification in accordance with the constitutional procedures of each Party. This Treaty shall enter into force on the day of the exchange of instruments of ratification which exchange shall take place simultaneously with the exchange of instruments of ratification of the Treaty on the Limitation of Underground Nuclear Weapon Tests.

2. This Treaty shall be registered pursuant to Article 102 of the Charter of the United Nations.

DONE at Washington and Moscow, on May 28, 1976, in duplicate, in the English and Russian languages, both texts being equally authentic.

For the United States of America:

GERALD R. FORD,

The President of the United States of America.

For the Union of Soviet Socialist Republics:

L. BREZHNEV,

General Secretary of the Central Committee of the CPSU.

PROTOCOL TO THE TREATY BETWEEN
THE UNITED STATES OF AMERICA AND
THE UNION OF SOVIET SOCIALIST REPUBLICS
ON UNDERGROUND NUCLEAR EXPLOSIONS
FOR PEACEFUL PURPOSES

The United States of America and the Union of Soviet Socialist Republics, hereinafter referred to as the Parties,

Confirming the provisions of the Treaty Between the United States of America and the Union of Soviet Socialist Republics on Underground Nuclear Explosions for Peaceful Purposes of May 28, 1976, hereinafter referred to as the Treaty,

Taking into account the fact that nuclear explosions for peaceful purposes are conducted outside national nuclear test sites under various geological conditions,

Convinced of the necessity to ensure effective verification of compliance with the Treaty,

Have agreed as follows:

SECTION I. DEFINITIONS

In addition to the definitions of terms set forth in Article II of the Treaty, for the purposes of this Protocol:

1. The term "emplacement hole" means the entire interior of any drill hole, shaft, adit or tunnel in which an explosive, associated cables, and other equipment are installed for the purposes of carrying out an explosion.

2. The term "Verifying Party" means the Party entitled to carry out, in accordance with this Protocol, activities related to verification of compliance with the Treaty by the Party carrying out an explosion.

3. The term "Designated Personnel" means personnel appointed by the Verifying Party from among its nationals and included on its list of Designated Personnel, in accordance with Section IX of this Protocol, to carry out activities related to verification, in accordance with this Protocol, in the territory of the Party carrying out the explosion.

4. The term "Transport Personnel" means personnel appointed by the Verifying Party from among its nationals and included on its list of Transport Personnel, in accordance with Section IX of this Protocol, to provide transportation for Designated Personnel, their baggage, and equipment of the Verifying Party between the territory of the Verifying Party and the point of entry in the territory of the Party carrying out the explosion.

5. The term "point of entry" means Washington, D.C. (Dulles International Airport) with respect to the United States of America; and Moscow (Sheremetyevo-2 Airport) with respect to the Union of Soviet Socialist Republics. Other locations may serve as points of entry for specific explosions, as agreed by the Parties.

6. The term "on-site inspection" means activities carried out by the Verifying Party in the territory of the Party carrying out the explosion, in accordance with Section VII of this Protocol, for the purposes of independently obtaining data on conditions under which the explosion will be conducted and confirming the validity of data provided by the Party carrying out the explosion.

7. The term "hydrodynamic yield measurement method" means the method whereby the yield of an explosion is derived from on-site, direct measurement of the position

of the shock front as a function of time during the hydrodynamic phase of the ground motion produced by the explosion.

8. The term "local seismic network" means the array of seismic stations and the control point temporarily deployed, in accordance with this Protocol, for the purpose of identifying the number of individual explosions in a specific group explosion.

9. The term "Joint Consultative Commission" means the Commission established in accordance with Article V of the Treaty.

10. The term "Coordinating Group" means a working group of the Joint Consultative Commission, established in accordance with Section XI of this Protocol.

11. The term "Nuclear Risk Reduction Centers" means the Centers located in Washington, D.C., and Moscow, established in accordance with the Agreement Between the United States of America and the Union of Soviet Socialist Republics on the Establishment of Nuclear Risk Reduction Centers of September 15, 1987.

SECTION II. EXPLOSION DEPTH AND COMPOSITION

1. No explosion shall be conducted at a distance in meters from the ground surface less than 30 times the 3.4 root of the planned yield of that explosion in kilotons.

2. No group explosion shall have an aggregate yield exceeding 150 kilotons unless the Parties agree on specific procedures to implement appropriate provisions of this Protocol so as to permit identification of each individual explosion and determination of the yield of each individual explosion in the group.

3. No explosion having a planned yield exceeding 35 kilotons shall be conducted in a cavity having a volume exceeding 20,000 cubic meters, unless the Parties agree on verification measures for such an explosion.

SECTION III. VERIFICATION MEASURES

1. For the purposes of the Treaty, all underground nuclear explosions conducted outside national nuclear test

sites shall be considered underground nuclear explosions for peaceful purposes subject to all the provisions of the Treaty. For purposes of verification of compliance with the Treaty, in addition to using available national technical means, the Verifying Party shall have the right:

(a) to use the hydrodynamic yield measurement method, in accordance with Section V of this Protocol, to measure the yield of each explosion that the Party carrying out the explosion notifies, in accordance with paragraph 3 of Section IV of this Protocol, to have a planned yield exceeding 50 kilotons;

(b) to use the hydrodynamic yield measurement method, in accordance with Section V of this Protocol, to monitor the yield of each individual explosion in a group explosion that the Party carrying out the explosion notifies, in accordance with paragraph 3 of Section IV of this Protocol, to have a planned aggregate yield exceeding 50 kilotons;

(c) to use, in conjunction with the use of the hydrodynamic yield measurement method, a local seismic network, in accordance with Section VI of this Protocol, for each group explosion that the Party carrying out the explosion notifies, in accordance with paragraph 3 of Section IV of this Protocol, to have a planned aggregate yield exceeding 150 kilotons; and

(d) to carry out on-site inspection, in accordance with Section VII of this Protocol, with respect to any explosion that the Party carrying out the explosion notifies, in accordance with paragraph 3 of Section IV of this Protocol, to have a planned yield exceeding 35 kilotons and, with respect to any explosion having a planned yield exceeding 50 kilotons, only if the Verifying Party has decided not to use the hydrodynamic yield measurement method.

2. The Party carrying out the explosion shall bear full responsibility for, and have exclusive control over, the conduct of the explosion.

3. Designated Personnel shall be responsible for the working of their equipment, its timely installation and operation, for participating in such operations, including dry runs, as the Party carrying out the explosion may request, and for recording data at the time of the explosion. The Party carrying out the explosion shall be under no obligation to change the time of the explosion because of any malfunction of the equipment of the Verifying Party or inability of Designated Personnel to carry out their functions, unless actions of the Party carrying out the explosion have caused such a situation to arise.

PR

SECTION IV. NOTIFICATIONS AND INFORMATION RELATING TO EXPLOSIONS

1. Unless the Parties otherwise agree, all notifications provided for in this Protocol shall be transmitted through the Nuclear Risk Reduction Centers. The Nuclear Risk Reduction Centers may also be used, as appropriate, to transmit other information provided in accordance with this Protocol.

2. Not later than July 1 following entry into force of the Treaty, and each July 1 thereafter, each Party shall inform the other Party whether or not it intends to conduct, during the following calendar year, any individual or group explosion for peaceful purposes having a planned aggregate yield exceeding 35 kilotons, and, if so, how many. On the date of entry into force of the Treaty, information specified by this paragraph shall be provided by each Party for the remainder of the calendar year in which the Treaty enters into force and for the period from January 1 through December 31 of the succeeding year. In the event of changes in the information provided in accordance with this paragraph, such changes shall be immediately provided to the other Party.

3. No less than 180 days prior to the planned date of the beginning of emplacement of the explosive or explosives for every explosion having a planned yield exceeding 35 kilotons, the Party carrying out the explosion shall notify the Verifying Party of its intention to carry out the explosion and shall provide the Verifying Party with the following information, to the extent and degree of accuracy available at the time when it is provided:

(a) the planned date of the explosion;

(b) the planned date of the beginning of emplacement of the explosive or explosives;

(c) the purpose of the explosion;

(d) the location of the explosion, expressed in geographic coordinates to the nearest minute;

(e) the planned yield of the explosion;

(f) the number of explosives, and the planned yield of each individual explosive;

(g) the planned depth of emplacement of each explosive to the nearest 10 meters;

(h) the type or types of rock in which the explosion will take place, including the depth of the water table; and

(i) a description of specific technological features of the project of which the explosion is a part that may affect determination of its yield and confirmation of its purpose.

4. Following receipt of information specified in paragraph 3 of this Section, the Verifying Party shall inform the Party carrying out the explosion, no less than 150 days prior to the planned date of the beginning of emplacement of explosives, in a single notification, whether or not it intends to carry out one of the following activities related to verification:

(a) with respect to an explosion having a planned yield exceeding 35 kilotons, to carry out on-site inspection in accordance with Section VII of this Protocol; or

(b) with respect to an explosion having a planned yield exceeding 50 kilotons, to use the hydrodynamic yield measurement method, in accordance with Section V of this Protocol, and, with respect to a group explosion having a planned aggregate yield exceeding 150 kilotons, to use, in conjunction with the hydrodynamic yield measurement method, a local seismic network, in accordance with Section VI of this Protocol.

5. If the Verifying Party:

(a) declares its intention not to conduct activities described in paragraphs 4(a) and 4(b) of this Section, it shall thereby forfeit its right to conduct such activities unless the Party carrying out the explosion provides notification, in accordance with paragraph 9 of this Section, of a change in the location by more than one minute of latitude or longitude or of a change in the planned date of the explosion that changes the date indicated in the initial notification by 60 days or more. Within 30 days of notification by the Party carrying out the explosion of any such change in location or planned date of the explosion, the Verifying Party shall have the right to revise the notification it provided in accordance with paragraph 4 of this Section. In the event the Verifying Party elects to revise its notification and to use the hydrodynamic yield measurement method or to carry out on-site inspection, the beginning of emplacement of explosives shall not

occur less than 90 days from the date of the Verifying Party's revised notification, unless the Parties otherwise agree. The Party carrying out the explosion shall thereafter provide the Verifying Party with the information specified in paragraph 6 or 7 of this Section; or

(b) decides not to conduct the activities related to verification specified by it in its initial notification, after technical and logistical support requirements for these activities have been agreed upon in the Coordinating Group, in accordance with paragraph 6 of Section XI of this Protocol, the Verifying Party shall reimburse the Party carrying out the explosion for costs for such technical and logistical support incurred by the Party carrying out the explosion prior to receipt of notification that the Verifying Party will not carry out the initially-declared activities related to verification.

6. In the event of receipt by the Party carrying out the explosion of notification from the Verifying Party of its intent to use the hydrodynamic yield measurement method, the Party carrying out the explosion shall provide the Verifying Party not less than 60 days prior to the planned date of the beginning of emplacement of explosives with the following information:

(a) the number of explosives; the planned yield of each explosive; the planned depth of emplacement of each explosive with an accuracy of 10 meters; the planned point of emplacement of each explosive to be used in a group explosion relative to all other explosives in the group with an accuracy of 10 percent of the distance between that explosive and the nearest other explosive, but in no case shall the error be greater than 100 meters; and the planned time intervals between individual explosions in each group explosion with an accuracy of 0.1 second;

(b) a description of the geological and geophysical characteristics of the site of each explosion that could influence determination of the yield, which shall include: the depth of the water table; a stratigraphic column above each emplacement point; the position of each emplacement point relative to nearby geological and other features that influenced the design of the project of which the explosion is a part; and the estimated physical parameters of the rock within each hydrodynamic measurement zone, including bulk density, grain density, compressional and shear-wave velocities, porosity, and total water content;

(c) the locations and purposes of facilities and installations that are associated with the conduct of the explosion;

(d) the planned date of the beginning of emplacement of each explosive;

(e) a topographic chart, marked with geographic coordinates accurate to one minute of latitude and longitude, of the areas circumscribed by circles of 15 kilometer radius centered on points on the surface of the earth above the points of emplacement of each explosive, at a scale of 1:24,000 or 1:25,000 with a contour interval of 10 meters or less. The planned location of each explosive shall be marked on this chart with an accuracy of 50 meters;

(f) the length of each canister in which an explosive will be contained, hereinafter referred to as an explosive canister;

(g) the dimensions of any pipe or other device that will be used to emplace each explosive canister;

(h) the planned cross-sectional dimensions of each emplacement hole within the hydrodynamic measurement zones;

(i) a description of materials, including their densities, to be used to stem the emplacement hole within each hydrodynamic measurement zone; and

(j) the location and configuration of any known voids larger in volume than one cubic meter within each hydrodynamic measurement zone.

7. In the event of receipt by the Party carrying out the explosion of notification from the Verifying Party of its intent to carry out on-site inspection, the Party carrying out the explosion shall provide the Verifying Party, not less than 60 days prior to the planned date of the beginning of emplacement of explosives, with the following information:

(a) the number of explosives; the planned yield of each explosive; the planned depth of emplacement of each explosive with an accuracy of 10 meters; the planned point of emplacement of each explosive to be used in a group explosion relative to all other explosives in the group with an accuracy of 10 percent of the distance between that explosive and the nearest other explosive, but in no case shall the error be

greater than 100 meters; and the planned time intervals between individual explosions in each group explosion with an accuracy of 0.1 second;

(b) a description of the geological and geophysical characteristics of the site of each explosion that could influence determination of the yield, which shall include: the depth of the water table; a lithologic column above each emplacement point; the position of each emplacement point relative to nearby geological and other features that influenced the design of the project of which the explosion is a part; and the estimated physical parameters of the rock within each hydrodynamic measurement zone, including bulk density, grain density, porosity, and total water content;

(c) the locations and purposes of facilities and installations that are associated with the conduct of the explosion;

(d) the planned date of the beginning of emplacement of each explosive;

(e) a topographic chart, marked with geographic coordinates accurate to one minute of latitude and longitude, of the areas circumscribed by circles of 15 kilometer radius centered on points on the surface of the earth above the points of emplacement of each explosive, at a scale of 1:24,000 or 1:25,000 with a contour interval of 10 meters or less. The planned location of each explosive shall be marked on this chart with an accuracy of 50 meters;

(f) the planned cross-sectional dimensions of each emplacement hole within the hydrodynamic measurement zones; and

(g) the location and configuration of any known voids larger in volume than one cubic meter within each hydrodynamic measurement zone.

8. For each explosion, the Party carrying out the explosion shall inform the Verifying Party, no less than two days prior to the explosion, of the planned time of detonation of each explosive, with an accuracy of 0.1 second. In the event the Party carrying out the explosion decides to change the detonation time, the Verifying Party shall be notified of this change immediately after this decision has been taken. No more than 10 days following the explosion the Verifying Party shall be informed of the actual detonation time.

9. The Party carrying out the explosion shall immediately notify the Verifying Party of any change in any information provided in accordance with paragraph 3, 6, or 7 of this Section. If the Verifying Party has provided notification under paragraph 4 of this Section of its decision to use the hydrodynamic yield measurement method or to carry out on-site inspection, the emplacement of explosives shall not begin less than 90 days following notification of any change in any information provided in accordance with paragraph 3, 6, or 7 of this Section that requires more extensive verification procedures than are required on the basis of initial information, unless an earlier date for the beginning of emplacement of explosives has been agreed upon by the Parties. Such changes include:

(a) change in the location of the explosion by more than one minute of latitude or longitude;

(b) change in the number of explosives in a group explosion;

(c) change in the yield of the explosion;

(d) change in the purpose of the explosion; and

(e) delay in the planned date of the explosion by more than 90 days.

10. In using an explosion to decrease the consequences of an emergency situation related to an unforeseen set of circumstances and requiring immediate action, by virtue of which it would be practically impossible to adhere to the requirements of paragraph 3 of this Section concerning the time period, the following conditions shall be fulfilled:

(a) the Party making the decision to carry out an explosion for such a purpose shall notify the Verifying Party of this decision immediately after it has been made and shall describe the circumstances and provide the planned yield for such an explosion;

(b) the planned aggregate yield for such an explosion shall not exceed 100 kilotons and the explosion shall not include more than three individual explosions, unless the Parties otherwise agree;

(c) the Party carrying out such an explosion shall provide the Verifying Party with the information specified in paragraphs 3 and 6 of this Section, to the extent such information is available, after making the decision on carrying out the explosion, but no less than 60 days prior to the beginning of emplacement of explosives; and

(d) if, within 15 days following receipt of notification of such an explosion, the Verifying Party has made the decision to carry out verification of that explosion using the hydrodynamic yield measurement method, it shall deliver hydrodynamic yield measurement equipment to the point of entry in the territory of the Party carrying out the explosion no less than 35 days prior to the planned date of the beginning of emplacement of explosives, in accordance with paragraphs 8(b), 8(c), 8(d), 8(e), and 8(f) of Section VIII of this Protocol. This equipment shall be handed over, in the same condition as that in which it was received, to Designated Personnel at the site of the explosion for emplacement, installation, and use no less than 20 days prior to the planned date of the beginning of emplacement of explosives.

11. The Party carrying out an explosion shall have the right to make changes in the schedule of operations related to the conduct of the explosion. In the event the Verifying Party exercises its rights to use the hydrodynamic yield measurement method or to carry out on-site inspection, in accordance with Section III of this Protocol, the Party carrying out the explosion shall immediately inform the Verifying Party of any such change in the schedule of operations. In the event the Verifying Party has provided notification, under paragraph 4 of this Section, of its decision to use the hydrodynamic yield measurement method or to carry out on-site inspection, the explosion shall not be carried out more than five days prior to the planned date of the explosion indicated in the initial notification, unless the Parties otherwise agree.

12. The Verifying Party may at any time, but no more than one year after the explosion, request from the Party carrying out the explosion clarification of any point of information provided in accordance with this Section. Such clarification shall be provided in the shortest possible time, but no more than 30 days following receipt of a request.

SECTION V. HYDRODYNAMIC YIELD MEASUREMENT METHOD

1. The hydrodynamic measurement zone for each explosive means a cylindrical region coaxial with the emplacement hole of that explosive. This region extends in the direction of the entrance to the emplacement hole from the midpoint of the canister containing that explosive to the point at which the axis of the emplacement hole intersects a spherical surface whose radius, measured from

the midpoint of the canister containing the explosive, is equal in meters to 10 times the cube root of the planned yield in kilotons of that explosive, or 25 meters, whichever is greater. The length of this region in the opposite direction from the same midpoint of the canister is equal in meters to three times the cube root of the planned yield in kilotons of that explosive, or 7.5 meters, whichever is greater. The radius of this region is equal in meters to three times the cube root of the planned yield in kilotons of that explosive, or 7.5 meters, whichever is greater.

2. For hydrodynamic yield measurement the following procedures shall apply:

(a) Designated Personnel shall emplace, for each explosive, the equipment specified in paragraph 5(a) of Section VIII of this Protocol in the same emplacement hole as the explosive. The equipment specified in paragraphs 5(a) and 5(b) of Section VIII of this Protocol shall be installed, in accordance with installation instructions provided in accordance with paragraph 8(a)(i) of Section VIII of this Protocol, by Designated Personnel under observation of personnel of the Party carrying out the explosion and with their assistance, if Designated Personnel have requested such assistance. The location of each recording facility and the command and monitoring facility of the Verifying Party shall be determined by agreement of the Parties with respect to each particular explosion. This equipment shall be operated by Designated Personnel;

(b) for each explosive, the equipment specified in paragraph 5(a) of Section VIII of this Protocol shall be installed so that the end point of the equipment farthest from the emplacement hole entrance is three meters from the surface of the explosive canister closest to the emplacement hole entrance as measured along the axis of the emplacement hole. The location of this equipment relative to the axis of the emplacement hole shall be agreed upon by the Parties. No more than six sensor channels shall be installed for each explosive. Each Party shall make documented records of measured distances to the sensors. These records shall be exchanged by the Parties;

(c) explosive canisters with a length greater than 10 meters or a diameter greater than three meters shall be used only if prior agreement has been reached between the Parties establishing, in each specific case, provisions for their use; and

(d) the Party carrying out the explosion shall fill all voids other than the explosive canister within the hydrodynamic measurement zone of each explosive in each emplacement hole with stemming material. This stemming material, beginning no more than three meters from each explosive canister cover towards the entrance of the hole, and proceeding in that direction, shall have a bulk density no less than 70 percent of the average density of the surrounding rock. An alternate stemming material may be used for filling the remainder of the hydrodynamic measurement zone of that explosive. For any explosive emplaced in an emplacement hole whose diameter is less than 30 centimeters and emplaced at a distance of more than 1.5 kilometers from the entrance of the hole, an alternate stemming material may be used for filling the entire hydrodynamic measurement zone of that explosive. If more than one explosive is emplaced in a single emplacement hole, the Parties shall agree upon an alternate stemming material for filling the entire hydrodynamic measurement zone of each explosive other than the explosive nearest the entrance of the emplacement hole if the emplacement hole diameter is greater than 30 centimeters but less than 60 centimeters. Any alternate stemming material shall have a bulk density no less than 1.2 grams per cubic centimeter. Pipes located within the hydrodynamic measurement zone need not be filled with stemming material if they have a cross-sectional area less than 10 square centimeters, or if they have a cross-sectional area less than 100 square centimeters and a length less than one meter. Costs incurred by the Party carrying out the explosion to ensure, within the hydrodynamic measurement zone, a density of stemming material no less than 70 percent of the average density of the surrounding rock shall be borne by the Verifying Party.

3. For a group explosion the Party carrying out the explosion shall ensure that the emplacement point of each explosive canister, the detonation sequence, and the time intervals between individual explosions are such that no explosion in the group shall interfere with the hydrodynamic yield measurement of any other individual explosion. With the exception of group explosions provided for in paragraph 2 of Section II of this Protocol, if the technological characteristics of the project of which the group explosion is a part make it impossible to satisfy this requirement, the Parties, prior to the beginning of emplacement of explosives, shall agree upon alternative hydrodynamic or other verification procedures.

4. In preparation for the use of the hydrodynamic yield measurement method, the Verifying Party shall have the right to confirm the validity of the geological and geophysical information provided in accordance with Section IV of this Protocol, in accordance with the following procedures:

(a) Designated Personnel may analyze relevant studies and measurement data, including logging data, of the Party carrying out the explosion, the core samples or rock fragments extracted from each emplacement hole within the hydrodynamic measurement zone, as well as any logging data and core samples from existing exploratory holes, which shall be provided to Designated Personnel upon their arrival at the explosion site, if the Party carrying out the explosion carried out relevant studies, measurements, and coring; and

(b) Designated Personnel shall have the right to observe logging and the extraction of core samples or rock fragments from locations agreed upon by the Parties within the hydrodynamic measurement zone in the emplacement hole or from an exploratory hole at depth intervals agreed upon by the Parties. Any such exploratory hole shall be no farther from the emplacement hole than a distance in meters of 10 times the cube root of the planned yield in kilotons of the emplaced explosive; or

(c) if the Party carrying out the explosion does not take core samples or rock fragments in accordance with subparagraph (b) of this paragraph or does not drill an exploratory hole meeting the requirements specified in subparagraph (b) of this paragraph, the Verifying Party shall have the right to extract sidewall rock samples from the emplacement hole with its own equipment, to drill such an exploratory hole, and to core this hole. Such operations shall be conducted in the presence of personnel of the Party carrying out the explosion. Such an exploratory hole shall be stemmed by the Party carrying out the explosion, at the expense of the Verifying Party; and

(d) Designated Personnel shall have the right to examine and remove from the territory of the Party carrying out the explosion logging data, core samples, sidewall rock samples, and rock fragments referred to in subparagraphs (a), (b), and (c) of this paragraph, as selected by Designated Personnel.

5. While using the hydrodynamic yield measurement method, Designated Personnel shall have the right:

(a) to confirm by direct measurement the validity of the information provided in accordance with paragraphs 6(f), 6(g), and 6(h) of Section IV of this Protocol;

(b) to confirm the validity of the information provided in accordance with paragraph 6(i) of Section IV of this Protocol, and to receive, upon request, a sample of each batch of stemming material as this material is placed in the emplacement hole within the hydrodynamic measurement zone; and

(c) to confirm the validity of the information provided in accordance with paragraphs 6(b) and 6(j) of Section IV of this Protocol, by observing, upon request, relevant field measurements being made by the Party carrying out the explosion if such measurements are made by the Party carrying out the explosion, and by making field measurements with its own logging equipment, to include determination of the location and configuration of any voids within each hydrodynamic measurement zone or, at the option of the Verifying Party under leasing conditions, with the logging equipment of the Party carrying out the explosion, if the Party carrying out the explosion has such equipment. Such field measurements shall be made in the presence of personnel of both Parties. All of the data produced by either Party, including calibration data, shall be duplicated, and one copy of the data shall be provided to each Party. Calibration data for the equipment shall include information to confirm the sensitivity of the equipment under the conditions in which it is utilized for this explosion.

6. Designated Personnel shall have the right:

(a) to have access to the site of the explosion and to facilities and structures related to the conduct of the explosion, along agreed routes;

(b) to observe the emplacement of each explosive canister, to confirm, by direct measurement, the depth of emplacement of each explosive canister and, for explosives in a group, the relative location of their points of emplacement, and to observe the stemming of each emplacement hole;

(c) to have access to their equipment associated with the use of the hydrodynamic yield measurement method from commencement of its use by Designated Personnel at the explosion site until the departure of all personnel from the explosion area prior to the explosion;

(d) to unimpeded visual observation of the entrance area to each emplacement hole at any time from the moment of emplacement of each explosive until the departure of all personnel from the explosion area prior to the explosion;

(e) to observe remotely by means of closed-circuit television equipment their hydrodynamic yield measurement equipment specified in paragraphs 5(b) and 5(c) of Section VIII of this Protocol;

(f) to observe the explosion; and

(g) to monitor electrically the integrity and performance of their equipment in each recording facility from the command and monitoring facility, to transmit the hydrodynamic yield measurement data from each recording facility to the command and monitoring facility, and to transmit the commands required for operation of each recording facility from the command and monitoring facility to each recording facility.

7. The Party carrying out the explosion shall produce, at the request of the Verifying Party, a timing reference command signal to each recording facility at two minutes, plus or minus 100 milliseconds, before the moment of the explosion, or before the first explosion in a group, and a zero-time reference signal to each corresponding recording facility for each explosion, with an accuracy of plus or minus one microsecond. The parameters for these signals, produced by the Party carrying out the explosion, and procedures for their transmission and reception shall be agreed upon by the Parties. At the Verifying Party's option, it shall have the right to generate a timing reference signal for each explosion, using the electromagnetic pulse from its hydrodynamic measurement cables. These timing reference signals shall be transmitted, used, and recorded by the Verifying Party without intervention by the Party carrying out the explosion.

8. Designated Personnel shall have the right to acquire photographs taken by the Party carrying out the explosion, with photographic cameras provided by the Verifying Party, under the following conditions:

(a) the Party carrying out the explosion shall identify those of its personnel who will take photographs;

(b) photographs shall be taken as requested by, and in the presence of, Designated Personnel. If requested by Designated Personnel, such photographs shall show the size of an object by placing a measuring

scale, provided by the Verifying Party, alongside that object during the photographing;

(c) Designated Personnel shall determine whether photographs conform to those requested and, if not, repeat photographs shall be taken; and

(d) before completion of any photographed operation related to emplacement, and prior to the time at which an object being photographed becomes permanently hidden from view, Designated Personnel shall determine whether requested photographs are adequate. If they are not adequate, before the operation shall proceed, additional photographs shall be taken until the Designated Personnel determine that the photographs of that operation are adequate. This photographic process shall be carried out as expeditiously as possible, and in no case shall the cumulative delay resulting from this process exceed two hours for each emplacement operation, unless the Parties otherwise agree.

9. Designated Personnel shall have the right to obtain photographs of the following:

(a) the exterior of installations and structures associated with the conduct of the explosion;

(b) the emplacement of each explosive canister and stemming of each emplacement hole as specified in paragraph 6(b) of this Section;

(c) geological samples used for confirming the validity of geological and geophysical information as provided for in paragraph 4 of this Section, and equipment used in obtaining such samples;

(d) emplacement and installation of hydrodynamic yield measurement method equipment and cables associated with it;

(e) containers, facilities and structures for storing and operating the equipment used by Designated Personnel; and

(f) with the agreement of the Party carrying out the explosion, other activities of Designated Personnel directly related to the use of the hydrodynamic yield measurement method.

10. Equipment identified by the Party carrying out the explosion, in accordance with paragraph 8(h) of Section VIII of this Protocol, as unacceptable for use at the time of the

explosion shall be sealed by both Parties and placed in the custody of the Party carrying out the explosion at a time agreed upon by the Party carrying out the explosion and by Designated Personnel.

11. Two individuals from the Party carrying out the explosion shall have the right to join Designated Personnel in the command and monitoring facility at the time of the explosion, to observe command and monitoring of the recording equipment and acquisition and duplication of data transmitted from each recording facility, and to receive a copy of the data. Designated Personnel, in the presence of personnel of the Party carrying out the explosion, shall recover all recordings of data taken at the time of the explosion and prepare two identical copies of such data. Personnel of the Party carrying out the explosion shall select one of the two identical copies by lot, and Designated Personnel shall retain the other copy. Designated Personnel shall retain no other such data, and shall have no further access to their recording facilities, their command and monitoring facility, and their equipment until these are returned to the Verifying Party, in accordance with paragraph 11 of Section VIII of this Protocol, unless the Parties otherwise agree, in which case access of the Designated Personnel to their recording facilities, their command and monitoring facility, and their equipment shall be under the observation of personnel of the Party carrying out the explosion. Designated Personnel shall provide the Party carrying out the explosion with information on sensor location in relation to the explosive canister. With respect to digital recording of signals, the Verifying Party shall provide a description of the recording format and a sample of the computer program for reading digital data. The program shall be provided by Designated Personnel upon their arrival at the point of entry.

12. Designated Personnel shall not be present in areas from which all personnel of the Party carrying out the explosion have been withdrawn in connection with carrying out an explosion, but shall have the right to reenter those areas at the same time as personnel of the Party carrying out the explosion.

SECTION VI. LOCAL SEISMIC NETWORK

1. For any group explosion that the Party carrying out the explosion has notified to have a planned aggregate yield exceeding 150 kilotons, and with respect to which the Verifying Party has notified its intention to measure the yield of the explosion using the hydrodynamic yield

measurement method, Designated Personnel, in addition to using the hydrodynamic yield measurement method, shall have the right to install and use, under the observation and with the assistance of personnel of the Party carrying out the explosion if Designated Personnel request such assistance, a local seismic network.

2. Such a network shall be installed and used at locations agreed upon by the Parties within an area circumscribed by circles of 15 kilometer radius centered on points on the surface of the earth above the points of emplacement of the explosives. The number of stations of the network shall be determined by the Verifying Party, but shall not exceed the number of explosives in the group plus eight.

3. The control point of the local seismic network shall be installed at a location that the Parties agree is outside the areas specified in paragraph 12 of Section V of this Protocol and within the area specified in paragraph 2 of this Section, unless the Parties otherwise agree. Designated Personnel shall have the right to have access to their equipment in the control point at any time from commencement of installation of the local seismic network until five days following the explosion, subject to the provisions of paragraph 12 of Section V, if applicable, and paragraph 10(e) of Section VIII of this Protocol.

4. Installation of a local seismic network may commence 20 days prior to the planned date of the explosion, and its operation shall continue no more than three days following the explosion, unless the Parties otherwise agree.

5. Designated Personnel shall have the right to use radio communication for the transmission and reception of data and control signals between seismic stations and the control point of the local seismic network. Frequencies and maximum power output of radio transmitters, frequency range and sensitivity of radio receivers, orientation of transmitting and receiving antennas, and period of operation of the local seismic network radio transmitters and radio receivers prior to the explosion shall be agreed upon by the Parties. Operation of the radio equipment following the explosion shall continue for no more than three days, unless the Parties otherwise agree.

6. Designated Personnel shall have access along agreed routes to the stations and the control point of the local seismic network for the purpose of carrying out activities related to the installation and use of the local seismic network.

7. In installing and using a local seismic network, Designated Personnel shall have the right to use and retain the topographic chart provided in accordance with paragraph 6(e) of Section IV of this Protocol.

8. Designated Personnel shall have the right to obtain photographs associated with the local seismic network, which shall be taken by the Party carrying out the explosion at the request of Designated Personnel in accordance with applicable provisions of paragraph 8 of Section V of this Protocol.

9. Within five days following the explosion, Designated Personnel shall provide the Party carrying out the explosion with the original and one copy of the data from the local seismic network stations recorded on the primary medium, graphic representation of recording materials on a paper medium, and the results of calibration of seismic channels. Upon receipt of these materials the Party carrying out the explosion, in the presence of Designated Personnel, shall select and retain either the copy or the original of each recording, graphic representation, and results of calibration of the seismic channels. The set of data not selected by the Party carrying out the explosion shall be retained by Designated Personnel. For digital recording of seismic signals, the Verifying Party shall provide the description of the recording format and a sample of the computer program for reading digital data. Designated Personnel shall provide the program sample upon arrival at the point of entry. Seismic recordings provided to the Party carrying out the explosion shall cover a time period beginning no less than 30 seconds prior to the time of arrival of the first explosion-generated P-wave at any station of the local seismic network and ending no more than three days after the explosion, unless the Parties otherwise agree. All seismic recordings shall include a common time reference agreed upon by the Parties.

SECTION VII. ON-SITE INSPECTION

1. In carrying out on-site inspection, the Verifying Party shall have the right to confirm the validity of the geological and geophysical information provided in accordance with paragraphs 3 and 7 of Section IV of this Protocol in accordance with the following procedures:

(a) Designated Personnel may analyze relevant studies and measurement data, including logging data, of the Party carrying out the explosion, the core

samples or rock fragments extracted from each emplacement hole from the bottom of the hole to a distance above the point of emplacement in meters equal to 40 times the cube root of the planned yield in kilotons of the emplaced explosive, as well as any logging data and core samples from existing exploratory holes, which shall be provided to Designated Personnel upon their arrival at the explosion site, if the Party carrying out the explosion carried out relevant studies, measurements, and coring;

(b) Designated Personnel shall have the right to observe logging and the extraction of core samples or rock fragments from locations agreed upon by the Parties within the portion of the emplacement hole specified in subparagraph (a) of this paragraph or from an exploratory hole, provided that it is located no farther from the emplacement hole than a distance in meters equal to 10 times the cube root of the planned yield in kilotons of the emplaced explosive at depth intervals agreed upon by the Parties if such operations are carried out by the Party carrying out the explosion;

(c) Designated Personnel shall have the right to use their own equipment for logging the emplacement hole and extracting sidewall rock samples within the portion of the emplacement hole identified in subparagraph (a) of this paragraph. Such operations shall be conducted in the presence of personnel of the Party carrying out the explosion; and

(d) all logging data produced by either Party, including calibration data, shall be duplicated, and one copy of the data shall be provided to each Party. Calibration data shall include information needed to confirm the sensitivity of the equipment under the conditions in which it is used. Designated Personnel shall have the right to examine and remove from the territory of the Party carrying out the explosion core samples, sidewall rock samples, and rock fragments specified in subparagraphs (a), (b), and (c) of this paragraph, as selected by Designated Personnel.

2. In carrying out on-site inspection, Designated Personnel shall have the right:

(a) to confirm by direct measurement the validity of the information provided in accordance with paragraph 7(f) of Section IV of this Protocol;

(b) to confirm the validity of the information provided in accordance with paragraph 7(g) of Section

IV of this Protocol, by observing relevant measurements being made, and by having access to the data obtained if such measurements are conducted by the Party carrying out the explosion, and by making measurements with their own equipment to determine the location and configuration of any voids within each hydrodynamic measurement zone;

(c) to have access to the site of the explosion and to facilities and structures related to the conduct of the explosion, along agreed routes;

(d) to observe the emplacement of each explosive canister, to confirm the depth of its emplacement and the relative location of explosives in a group, and to observe the stemming of each emplacement hole;

(e) to have access to their equipment associated with carrying out on-site inspection from commencement of its use by Designated Personnel at the explosion site until the departure of all personnel from the explosion area prior to the explosion;

(f) to unimpeded visual observation of the entrance area to each emplacement hole at any time from the moment of emplacement of each explosive until the departure of all personnel from the explosion area prior to the explosion; and

(g) to observe the explosion.

3. Designated Personnel shall have the right to obtain photographs associated with carrying out on-site inspection, which shall be taken by the Party carrying out the explosion at the request of Designated Personnel, in accordance with paragraphs 8 and 9 of Section V of this Protocol.

SECTION VIII. EQUIPMENT

1. Designated Personnel, in carrying out activities related to verification in accordance with this Protocol, shall have the right to bring into the territory of the Party carrying out the explosion, install, and use the following equipment:

(a) if the Verifying Party has provided notification of its intent to use the hydrodynamic yield measurement method, part or all of the equipment specified in paragraph 5 of this Section;

(b) if the Verifying Party has provided notification of its intent to use a local seismic network, part or all of the equipment specified in paragraph 6 of this Section;

(c) if the Verifying Party has provided notification of its intent to carry out on-site inspection, part or all of the equipment specified in paragraph 7 of this Section;

(d) geologist's field tools and kits, geodetic equipment, topographic survey equipment, equipment for recording of field data, and equipment for rapid photo processing;

(e) portable short-range communication equipment, whose power and frequency shall conform to restrictions established by the Party carrying out the explosion;

(f) mobile work stations and temporary facilities;

(g) medical and health physics equipment and supplies, personal protective gear, personal computers, recreational and other items as may be agreed by the Parties; and

(h) satellite communications equipment, if the Party carrying out the explosion does not provide satellite communications for Designated Personnel.

2. At the choice of the Party carrying out the explosion, closed-circuit television equipment shall be provided by the Verifying Party or the Party carrying out the explosion, for the purpose of remote observation by the Verifying Party, in accordance with paragraph 6(e) of Section V of this Protocol.

3. Designated Personnel, in carrying out activities related to verification in accordance with this Protocol, shall have the right to bring into the territory of the Party carrying out the explosion, for use by the personnel of the Party carrying out the explosion in accordance with paragraph 8 of Section V of this Protocol, photographic cameras, film, and related photographic equipment.

4. No less than 120 days prior to the planned date of the beginning of emplacement of explosives, the Parties shall agree upon the list of such additional equipment as may be requested by the Verifying Party, and which shall be supplied by the Party carrying out the explosion for use by Designated Personnel. Such additional equipment

with its description and operating instructions shall be provided to Designated Personnel upon arrival at the site of the explosion.

5. The complete list of equipment for hydrodynamic yield measurement shall include:

(a) sensing elements and associated cables for use in the emplacement hole;

(b) the recording facility or facilities, including equipment for sending and recording commands, equipment for generation of a timing reference signal from hydrodynamic measurement cables, and equipment for data acquisition, recording and processing, and, with respect to a group explosion in which any individual explosion in the group is separated from any other explosion by more than two kilometers, radio equipment for monitoring the operational status of the equipment and for transmitting and receiving control signals. Frequencies and maximum power output of radio transmitters, frequency range and sensitivity of radio receivers, and orientation of transmitting and receiving antennas shall be agreed upon by the Parties. Operation of the radio equipment shall begin at the time of the beginning of emplacement of sensing elements and associated cables and shall end at the time of the explosion. Designated Personnel shall notify the Party carrying out the explosion in advance of any activation or deactivation of the radio equipment;

(c) cables for above-ground transmission of electrical power, control signals and data;

(d) electrical power supplies;

(e) measuring and calibration instruments, support equipment, maintenance equipment, and spare parts necessary for ensuring the functioning of sensing elements, cables and equipment of the recording facilities and the command and monitoring facility;

(f) logging and sidewall rock sampling equipment necessary for confirming geological and geophysical characteristics of the emplacement hole as well as for obtaining data on the spatial location of points of emplacement of each explosive canister;

(g) coring equipment and drilling equipment for the drilling of an exploratory hole for coring

purposes. Upon agreement between the Parties, the Verifying Party, under leasing conditions, may use for these purposes the coring and drilling equipment of the Party carrying out the explosion; and

(h) the command and monitoring facility, with equipment, including computers, for generating and recording command and monitoring signals, for transmitting and receiving command and monitoring signals between each recording facility and the command and monitoring facility, as well as for retrieving, storing, and processing hydrodynamic data.

6. The complete list of equipment for a local seismic network shall include:

(a) seismic stations, each of which contains seismic instruments, an electrical power supply and associated cables, and radio equipment for receiving and transmitting control signals and data;

(b) equipment for the control point, including electrical power supplies, equipment for sending and recording control signals and data, and data processing equipment; and

(c) measuring and calibration instruments, support equipment, maintenance equipment, and spare parts necessary for ensuring the functioning of the complete network.

7. The complete list of equipment for on-site inspection shall include logging and sidewall rock sampling equipment necessary for confirming geological and geophysical characteristics of the emplacement hole as well as for obtaining data on the spatial location of points of emplacement of each explosive canister.

8. The following procedures shall be followed with respect to the equipment for hydrodynamic yield measurement, the equipment for on-site inspection, and the equipment for a local seismic network:

(a) no less than 140 days prior to the planned date of the beginning of emplacement of explosives, the Verifying Party, if it has declared its intention to use the hydrodynamic yield measurement method, shall provide the Party carrying out the explosion with the equipment and information specified in subparagraph (a)(i) of this paragraph and, if the Verifying Party has declared its intention to use a local seismic network, the equipment and information

specified in subparagraph (a)(ii) of this paragraph; or, if it has declared its intention to conduct on-site inspection, equipment and information specified in subparagraph (a)(iii) of this paragraph, in order to enable the Party carrying out the explosion to familiarize itself with such equipment, if such equipment and information have not previously been provided. If, upon completion of familiarization with the equipment provided in accordance with this subparagraph, the Party carrying out the explosion concludes that use of any element of the equipment provided would be inconsistent with its containment or security requirements, the Party carrying out the explosion shall promptly, but no less than 120 days prior to the planned date of the beginning of emplacement of explosives, so inform the Verifying Party, and shall specify the modifications that must be made in this equipment to satisfy the requirements of the Party carrying out the explosion. The equipment provided in accordance with this subparagraph shall be returned in the same condition as that in which it was received to the Verifying Party at the point of entry no less than 90 days prior to the planned date of the beginning of emplacement of explosives. The following equipment and information shall be provided:

(i) one set of equipment specified in paragraphs 5(a), 5(b), 5(c), 5(d), 5(e), 5(f) and 5(h) of this Section, as well as electrical and mechanical design information, specifications, and installation and operating instructions for this equipment;

(ii) one set of equipment specified in paragraph 6 of this Section, including one seismic station, as well as electrical and mechanical design information, specifications, and installation and operating instructions for this equipment; and

(iii) one set of equipment specified in paragraph 7 of this Section, as well as electrical and mechanical design information, specifications, and operating instructions for this equipment;

(b) no less than 50 days prior to the planned date of the beginning of emplacement of explosives, the Verifying Party shall deliver in sealed containers, to the point of entry in the territory of the Party carrying out the explosion, two identical sets of each type of equipment that it intends to use

for activities related to verification for that explosion, with a complete inventory of equipment, specifying any components that do not perform functions directly related to measurements during the explosion. These sets of equipment shall have the same components and technical characteristics as the equipment specified in subparagraph (a) of this paragraph, or, if specified by the Party carrying out the explosion in accordance with subparagraph (a) of this paragraph, shall contain modifications made in accordance with the requirements of the Party carrying out the explosion with regard to containment and security. Each of the two identical sets shall include the following:

(i) if the Verifying Party has provided notification of its intent to use the hydrodynamic yield measurement method, equipment specified in paragraphs 5(a), 5(b), and 5(h) of this Section; and

(ii) if the Verifying Party has provided notification of its intent to use a local seismic network, equipment specified in paragraphs 6(a) and 6(b) of this Section;

(c) the Party carrying out the explosion shall choose one of the two identical sets of each type of equipment for use by Designated Personnel;

(d) at the point of entry the Party carrying out the explosion shall affix its own seals to the sealed containers in which the equipment chosen for use arrived, shall ensure protection of this equipment throughout the entire period it is in the territory of the Party carrying out the explosion, and shall transport that equipment to the site of the explosion. Prior to shipment to the site of the explosion, the set of equipment chosen for use shall be kept sealed at the point of entry, and the time of its shipment to the site of the explosion shall be determined by the Party carrying out the explosion. The Party carrying out the explosion shall consult with Designated Personnel regarding plans and schedule of shipment of the equipment no less than 48 hours in advance of the shipment. Designated Personnel shall have the right to unimpeded verification of the integrity of their seals, to observe their equipment, and to accompany their equipment. This equipment shall be handed over to Designated Personnel at the site of the explosion for emplacement, installation, and use no less than 20 days prior to the planned date of the beginning of

emplacement of explosives, and it shall thereafter remain under the control of Designated Personnel; seals affixed to the equipment specified in paragraph 5(a) of this Section shall not be removed prior to preparation for installation of such equipment, at which time the seals shall be removed by Designated Personnel in the presence of personnel of the Party carrying out the explosion, and personnel of the Party carrying out the explosion thereafter shall have the right to observe all activities relating to the installation of such equipment;

(e) seals of the Verifying Party shall be removed from equipment not chosen for use, in the presence of personnel of both Parties, and thereafter this equipment shall be retained for inspection by the Party carrying out the explosion without the presence of Designated Personnel for a period ending no more than 30 days following the explosion, at which time such equipment shall be returned in the same condition as that in which it was received to the Verifying Party at the point of entry;

(f) no less than 50 days prior to the planned date of the beginning of emplacement of explosives, the Verifying Party shall provide, at its option, either one or two sets of the equipment that the Verifying Party intends to use for activities related to verification for this explosion, other than equipment specified in paragraph 8(b) of this Section. A complete inventory of such equipment, specifying any components that do not perform functions directly related to measurements during the explosion, shall be provided to the Party carrying out the explosion at least one week prior to the planned arrival of the equipment at the point of entry. If only one set of equipment is provided by the Verifying Party, the Party carrying out the explosion shall have the right to inspect this equipment upon its arrival at the point of entry for up to 30 days, without the presence of Designated Personnel. Upon conclusion of the inspection, the Party carrying out the explosion shall identify any equipment that it deems unacceptable for delivery to the site of the explosion, in which case such equipment shall be removed by the Verifying Party and returned to its territory. All equipment deemed acceptable for delivery to the site of the explosion shall be shipped to the site of the explosion so as to enable Designated Personnel to carry out their activities related to verification as set forth in the coordinated schedule specified in paragraph 6 of Section XI of this Protocol, but in no case less than

20 days prior to the beginning of emplacement of explosives. The Party carrying out the explosion shall transport this equipment in such a manner as to ensure that it is delivered to Designated Personnel in the same condition as that in which it was received. If two sets of equipment are provided by the Verifying Party, the procedures specified in paragraphs 8(b), 8(c), 8(d), and 8(e) of this Section for selection and inspection of equipment shall be followed. If the Verifying Party under leasing conditions uses coring and drilling equipment of the Party carrying out the explosion, such equipment shall be provided to Designated Personnel at the site of the explosion so as to enable Designated Personnel to carry out their activities related to verification as set forth in the coordinated schedule referred to in paragraph 6 of Section XI of this Protocol, but in no case less than 20 days prior to the beginning of emplacement of explosives, unless the Parties otherwise agree;

(g) with respect to the equipment specified in paragraphs 5(a) and 5(c) of this Section, the Party carrying out the explosion shall have the right to retain for its own purposes up to 150 meters of each type of cable in the set being inspected. The cable segments to be retained may be taken from any place along the length of the cable, but the number of individual segments shall not exceed the number of reels of cable in a set of equipment; and

(h) after inspecting the equipment in accordance with paragraphs 8(e) and 8(f) of this Section, the Party carrying out the explosion shall inform Designated Personnel what equipment of that delivered to the site of the explosion it deems unacceptable for use during the explosion.

9. Prior to the beginning of emplacement of explosives, Designated Personnel shall certify in writing to the personnel of the Party carrying out the explosion that the equipment delivered to the site of the explosion is in working condition.

10. Personnel of the Party carrying out the explosion shall have the right to observe use of equipment by Designated Personnel at the site of the explosion, with access to the recording facilities, the command and monitoring facility, the control point, and seismic stations of the local seismic network of the Verifying Party being subject to the following:

(a) at any time prior to the explosion that Designated Personnel are not present in the recording facilities, in the command and monitoring facility, in the control point, or at the seismic stations, these facilities, control point, and stations shall be sealed by the seals of both Parties. Seals may be removed by Designated Personnel only in the presence of personnel of the Party carrying out the explosion;

(b) prior to the explosion, personnel of the Party carrying out the explosion may enter the recording facilities, the command and monitoring facility, or the control point of the Verifying Party for the purpose of conducting operations that require the participation of both Parties only with the agreement of the Designated Personnel Team Leader and when accompanied by the Designated Personnel Team Leader or his designated representative;

(c) at all other times prior to the explosion, personnel of the Party carrying out the explosion may enter the recording facilities, the command and monitoring facility, or the control point of the Verifying Party only at the express invitation of the Designated Personnel Team Leader and when accompanied by the Designated Personnel Team Leader or his designated representative;

(d) following the explosion, Designated Personnel shall have the right to enter the recording facilities for data recovery only when accompanied by personnel of the Party carrying out the explosion. No later than the final dry run, Designated Personnel shall inform the Party carrying out the explosion of procedures for recovering such data and shall advise the Party carrying out the explosion at the time of data recovery of any changes the Designated Personnel make in those procedures and the reasons for such changes. Personnel of the Party carrying out the explosion shall observe the process of data recovery from instrumentation in the recording facilities and the command and monitoring facility, and shall leave the recording facilities and the command and monitoring facility at the same time as Designated Personnel; and

(e) at any time following the explosion, personnel of the Party carrying out the explosion shall have the right to observe the activities of Designated Personnel in the control point. Personnel of the Party carrying out the explosion shall be present in the control point to observe recovery of the initial data, which shall take place within one

hour following the explosion. At any time following the explosion that Designated Personnel are not present in the control point, the control point shall be sealed with the seals of both Parties. The seals may be removed by Designated Personnel only in the presence of personnel of the Party carrying out the explosion. Within five days following the explosion, Designated Personnel shall leave the control point at the same time as personnel of the Party carrying out the explosion.

11. Following data recovery, the equipment used for activities related to verification in accordance with this Protocol may be retained by the Party carrying out the explosion and be subject to its exclusive control for a period ending no more than 30 days following data recovery, at which time this equipment shall be returned, in the same condition as that in which it was received, to the Verifying Party at the point of entry. Elimination of information stored in memories shall not be deemed damage to the equipment.

SECTION IX. DESIGNATED PERSONNEL AND TRANSPORT PERSONNEL

1. No later than 10 days following entry into force of the Treaty, each Party shall provide the other Party with a list of its proposed Designated Personnel who will carry out the activities related to verification in accordance with this Protocol and a list of its proposed Transport Personnel who will provide transportation for these Designated Personnel, their baggage, and equipment of the Verifying Party. These lists shall contain name, date of birth, and sex of each individual of its proposed Designated Personnel and Transport Personnel. The list of Designated Personnel shall at no time include more than 200 individuals, and the list of Transport Personnel shall at no time include more than 200 individuals.

2. Each Party shall review the list of Designated Personnel and the list of Transport Personnel proposed by the other Party. If the Party reviewing a list determines that an individual included thereon is acceptable to it, it shall so inform the Party providing the list within 20 days following receipt of the list, and such an individual shall be deemed accepted. If the Party reviewing a list determines that an individual included thereon is not acceptable to it, it shall so inform the Party providing the list of its objection within 20 days following receipt of the list, and such an individual shall be deemed not accepted and shall be deleted from the list.

3. Each Party may propose the addition or substitution of individuals on its list of Designated Personnel or its list of Transport Personnel at any time, who shall be designated in the same manner as is provided for in paragraph 2 of this Section with regard to the initial lists. Annually, no more than 40 individuals from the list of Designated Personnel shall be subject to substitution. This limitation shall not apply to the replacement of individuals due to permanent physical incapacity or death, or to deletion of an individual from the list of Designated Personnel in accordance with paragraph 5 of this Section. Replacement of an individual due to permanent physical incapacity, death or deletion from the list shall be accomplished in the same manner as is provided for in paragraph 2 of this Section.

4. Following receipt of the initial list of Designated Personnel or the initial list of Transport Personnel or of subsequent changes thereto, the Party receiving such information shall prepare for the issuance of such visas and other documents as may be required to ensure that each individual on the list of Designated Personnel or the list of Transport Personnel to whom it has agreed may enter and remain in its territory for the purpose of carrying out activities related to verification in accordance with this Protocol. Such visas and documents shall be provided by the Party carrying out the explosion only to the individuals whose names are included on the lists provided by the Verifying Party, in accordance with paragraph 3 of Section X of this Protocol, upon receipt of such lists. Such visas and documents shall be valid for multiple entry throughout the period of preparation and conduct of the particular explosion.

5. If a Party determines that an individual included on the list of Designated Personnel or the list of Transport Personnel of the other Party has violated the provisions of this Protocol or has ever committed a criminal offense in its territory, or has ever been sentenced for committing a criminal offense, or has ever been expelled from its territory, the Party making such a determination shall so notify the other Party of its objection to the continued inclusion of this individual on the list. If at that time this individual is present in the territory of the Party raising the objection, the other Party shall immediately recall this individual from the territory of the Party raising this objection and immediately thereafter delete that individual from the list of Designated Personnel or from the list of Transport Personnel.

6. Designated Personnel with their personal baggage and equipment of the Verifying Party shall be permitted to

enter the territory of the Party carrying out the explosion at the designated point of entry, to remain in that territory and to exit through the designated point of entry.

7. Designated Personnel and Transport Personnel shall be accorded the following privileges and immunities for the entire period they are in the territory of the Party carrying out the explosion and thereafter with respect to acts previously performed in the exercise of their official functions as Designated Personnel or Transport Personnel:

(a) Designated Personnel and Transport Personnel shall be accorded the inviolability enjoyed by diplomatic agents pursuant to Article 29 of the Vienna Convention on Diplomatic Relations of April 18, 1961;

(b) living and working quarters occupied by Designated Personnel and Transport Personnel carrying out activities in accordance with this Protocol shall be accorded the inviolability and protection accorded the quarters of missions and diplomatic agents pursuant to Articles 22 and 30 of the Vienna Convention on Diplomatic Relations;

(c) archives, documents, papers and correspondence of Designated Personnel and Transport Personnel shall enjoy the inviolability accorded the archives, documents, papers and correspondence of missions and diplomatic agents pursuant to Articles 24 and 30 of the Vienna Convention on Diplomatic Relations. In addition, the aircraft or other transport vehicles of the Verifying Party shall be inviolable;

(d) Designated Personnel and Transport Personnel shall be accorded the immunities accorded diplomatic agents pursuant to paragraphs 1, 2, and 3 of Article 31 of the Vienna Convention on Diplomatic Relations. Immunity from jurisdiction of Designated Personnel or Transport Personnel may be waived by the Verifying Party in those cases in which it is of the opinion that immunity would impede the course of justice and it can be waived without prejudice to the implementation of the provisions of this Protocol. Waiver must always be express;

(e) Designated Personnel and Transport Personnel carrying out their activities in accordance with this Protocol shall be accorded the exemption from dues and taxes accorded diplomatic agents

pursuant to Article 34 of the Vienna Convention on Diplomatic Relations;

(f) living and working quarters occupied by Designated Personnel and Transport Personnel carrying out their activities in accordance with this Protocol shall be accorded the exemption from dues and taxes accorded mission premises pursuant to Article 23 of the Vienna Convention on Diplomatic Relations; and

(g) Designated Personnel and Transport Personnel shall be permitted to bring into the territory of the Party carrying out the explosion, without payment of any customs duties or related charges, articles for their personal use, with the exception of articles the import or export of which is prohibited by law or controlled by quarantine regulations.

8. Designated Personnel and Transport Personnel shall not engage in any professional or commercial activity for personal profit in the territory of the Party carrying out the explosion.

9. Without prejudice to their privileges and immunities, Designated Personnel and Transport Personnel shall be obliged to respect the laws and regulations of the Party carrying out the explosion and shall be obliged not to interfere in the internal affairs of that Party.

10. If the Party carrying out the explosion considers that there has been an abuse of privileges and immunities specified in paragraph 7 of this Section, consultations shall be held between the Parties to determine whether such an abuse has occurred and, if so determined, to prevent a repetition of such an abuse.

SECTION X. ENTRY, TRANSPORT, FOOD, LODGING AND PROVISION OF SERVICES FOR DESIGNATED PERSONNEL AND TRANSPORT PERSONNEL

1. The Party carrying out the explosion shall ensure Designated Personnel and Transport Personnel access to its territory for the purposes of carrying out activities related to verification, in accordance with this Protocol, and shall provide these personnel with such other assistance as may be necessary to enable them to carry out these activities. Following notification by the Verifying Party of its intention to conduct hydrodynamic yield

measurement or to carry out on-site inspection, Designated Personnel shall have the right to be present at the site of the explosion to carry out activities in accordance with this Protocol at such times and for such periods as required to carry out these activities. The specific times and periods for carrying out such activities shall be specified in the coordinated schedule specified in paragraph 6 of Section XI of this Protocol.

2. The number of Designated Personnel shall not exceed:

(a) when exercising their rights and functions associated with drilling, logging, hole surveying, and coring, if this work is carried out by Designated Personnel operating their own equipment or equipment leased from the Party carrying out the explosion, 25;

(b) when exercising their rights and functions associated with observing drilling, logging, hole surveying, and coring performed by the Party carrying out the explosion, or when Designated Personnel perform logging, hole surveying, or sidewall rock sampling, 10;

(c) when exercising their rights and functions associated with the confirmation of the validity of geological and geophysical information, the number of emplacement holes plus three;

(d) when exercising their rights and functions associated with the use of hydrodynamic yield measurement equipment, the number of explosives plus three, plus the number of recording facilities specified in paragraph 5 of Section VIII of this Protocol multiplied by seven; and, with respect to group explosions in which radio controlled recording facilities are employed, three per recording facility, plus seven for the command and monitoring facility;

(e) when exercising their rights and functions associated with the use of a local seismic network, 15;

(f) for administrative, coordination, clerical, and health and safety matters, when Designated Personnel described in subparagraphs (a), (b), (c), (d), and (e) of this paragraph are present, eight; and

(g) if the Verifying Party provides food and housing for Designated Personnel identified in subparagraphs (a), (b), (c), (d), (e), and (f) of this paragraph, six.

3. No less than 20 days prior to the planned arrival of its Designated Personnel or equipment at the point of entry to carry out activities related to verification of a particular explosion, the Verifying Party shall provide the Party carrying out the explosion with:

(a) a list of the names of the Designated Personnel, their passports and documentation, and a list of the names of the Transport Personnel, their passports and documentation, who will carry out activities related to verification of a particular explosion;

(b) the names of the Designated Personnel Team Leader and deputy team leader, and the names of those individuals from the Designated Personnel who will escort equipment of the Verifying Party to the site of the explosion;

(c) confirmation of the point of entry to be used;

(d) the scheduled date and the estimated time of arrival of Designated Personnel at the point of entry; and

(e) designation of the mode of transport to be used.

No more than 15 days following receipt of the lists, passports, and documentation specified in subparagraph (a) of this paragraph, the Party carrying out the explosion shall return those passports to the Verifying Party with the visas and documents specified in paragraph 4 of Section IX of this Protocol.

4. If a transport aircraft other than a regularly scheduled commercial aircraft is used for transportation, its flight path shall be along airways that are agreed upon by the Parties, and its flight plan shall be filed in accordance with the procedures of the International Civil Aviation Organization applicable to civil aircraft, including in the remarks section of the flight plan a confirmation that the appropriate clearance has been obtained. The Party carrying out the explosion shall provide parking, security protection, servicing, and fuel for the aircraft of the Verifying Party at the point of entry. The Verifying Party shall bear the cost of such fuel and servicing.

5. The Party carrying out the explosion shall ensure that any necessary clearances or approvals are granted so as to enable Designated Personnel, their baggage, and

equipment of the Verifying Party to arrive at the point of entry by the estimated arrival date and time.

6. The Party carrying out the explosion shall assist Designated Personnel and Transport Personnel and their baggage in passage through customs without undue delay. The Party carrying out the explosion shall provide transportation between the point of entry and the site of the explosion for Designated Personnel, for their baggage and equipment of the Verifying Party, so as to enable such personnel to exercise their rights and functions in the time periods provided for in this Protocol.

7. The Party carrying out the explosion shall have the right to assign its personnel to escort Designated Personnel and Transport Personnel while they are in the territory of the Party carrying out the explosion.

8. Except as otherwise provided for in this Protocol, movement and travel of Designated Personnel and Transport Personnel shall be subject to the authorization of the Party carrying out the explosion.

9. During the period Designated Personnel and Transport Personnel are in the territory of the Party carrying out the explosion, the Party carrying out the explosion shall provide food, living and working facilities, secure places for storing equipment, transportation, and medical services for such personnel. If the Verifying Party desires to provide its own food or housing units for its Designated Personnel, or food for its Transport Personnel during their stay in the territory of the Party carrying out the explosion, the Party carrying out the explosion shall provide such assistance as may be necessary for such food and housing units to arrive at the appropriate locations. If the Verifying Party provides its own housing units, they shall be delivered to the point of entry no less than 30 days prior to the arrival of Designated Personnel. The Party carrying out the explosion shall have the right to inspect these housing units upon their arrival at the point of entry for a 30-day period, without the presence of personnel of the Verifying Party.

10. The Party carrying out the explosion shall ensure the Designated Personnel Team Leader or his designated representative access at all times to means of direct communications between the site of the explosion and the embassy of the Verifying Party, and shall provide Designated Personnel with telephone communications between their working facilities and living accommodations at the site of the explosion. The Designated Personnel Team Leader or his designated representative shall also have

the right to use at all times satellite communications to ensure communications via the International Maritime Satellite Organization (INMARSAT) commercial satellite system, or a system of equivalent performance, between the site of the explosion and the telephone communications system of the Verifying Party. If the Party carrying out the explosion does not provide such communications, Designated Personnel shall have the right to use their own equipment specified in paragraph 1(h) of Section VIII of this Protocol. In this case, installation and alignment of all such equipment shall be done jointly. All equipment of this system, except the remote control unit, shall be locked and placed under seals of both Parties, and neither Party shall have access to this equipment except under the observation of personnel of the other Party. Designated Personnel shall have exclusive use of the remote control unit. If the Verifying Party provides satellite communications equipment, personnel of the Party carrying out the explosion shall have the right, under the observation of Designated Personnel, to make the following modifications provided they do not degrade the quality of communications:

(a) install bandpass filters, to limit the frequency range, in the antenna signal transmission and reception lines;

(b) modify the remote control unit to prevent manual tuning; and

(c) modify the satellite communications equipment to allow the Party carrying out the explosion to monitor all transmissions.

11. At the site of the explosion, Designated Personnel shall observe all safety rules and regulations applicable to the personnel of the Party carrying out the explosion, as well as those additional restrictions with regard to access and movement as may be established by the Party carrying out the explosion. Designated Personnel shall have access only to the areas where they will directly exercise their rights and functions in accordance with Sections V, VI, and VII of this Protocol.

12. Designated Personnel shall not be given or seek access by physical, visual or technical means to the interior of the explosive canister, to documentary or other information descriptive of the design of an explosive, or to equipment for control and firing of explosives. The Party carrying out the explosion shall not locate documentary or other information descriptive of the design of an explosive in such ways as to impede Designated Personnel in carrying out their activities in accordance with this Protocol.

13. With the exception of those cases in which the Parties otherwise agree, all costs related to the activities of Designated Personnel and Transport Personnel carried out in accordance with this Protocol shall be borne by the Verifying Party, including costs for materials, equipment, leased equipment, and services that have been requested by and provided to the Verifying Party, as well as costs for transportation, food, living and working facilities, provision of medical assistance, and communications. These costs shall be billed at the standard or official rates existing in the territory of the Party carrying out the explosion.

14. The Verifying Party shall have the right to include among its Designated Personnel a medical specialist, who shall be allowed to bring medications, medical instruments, and portable medical equipment agreed upon by the Parties. If Designated Personnel are treated in a medical facility of the Party carrying out the explosion the medical specialist shall have the right to consult on the recommended treatment and monitor the course of medical treatment at all times. The medical specialist of the Verifying Party shall have the right to require the Party carrying out the explosion to provide emergency evacuation of any individual of Designated Personnel who is ill or suffered an accident to a mutually agreed medical facility in the territory of the Party carrying out the explosion or to the point of entry for emergency medical evacuation by the Verifying Party. Designated Personnel shall have the right to refuse any treatment prescribed by medical personnel of the Party carrying out the explosion, and in this case the Party carrying out the explosion shall not be responsible for any consequences of such refusal. Such refusal must always be express.

SECTION XI. PROCEDURES FOR CONSULTATION AND COORDINATION

1. To facilitate the implementation of this Protocol, the Parties shall use the Joint Consultative Commission, as provided for in the Treaty, that shall meet at the request of either Party. For each explosion for which activities are carried out in accordance with this Protocol, the Parties shall establish a Coordinating Group of this Commission.

2. The Coordinating Group shall be responsible for coordinating the activities of the Verifying Party with the activities of the Party carrying out the explosion.

3. The Coordinating Group shall operate throughout the entire period of preparing and carrying out of the activities related to verification for a particular explosion, until the departure of Designated Personnel from the territory of the Party carrying out the explosion.

4. The Representative of the Verifying Party to the Coordinating Group shall be the Designated Personnel Team Leader, whose name shall be provided simultaneously with the notification of intent to carry out activities related to verification for a particular explosion. All members of the Coordinating Group from the Verifying Party shall be drawn from the list of Designated Personnel. Within 15 days following receipt of this notification, the Party carrying out the explosion shall provide the Verifying Party with the name of its Representative to the Coordinating Group.

5. The first meeting of the Coordinating Group shall be convened in the capital of the Party carrying out the explosion within 25 days following notification by the Verifying Party of its intent to conduct activities related to verification for a particular explosion. Thereafter, the Coordinating Group shall meet at the request of either Party.

6. At the first meeting of the Coordinating Group, the Party carrying out the explosion shall present a list, including times and durations, of all its planned activities that are to be carried out as from the first day of this meeting and affect the rights of the Verifying Party provided in this Protocol. The Verifying Party shall provide a preliminary statement of its requirements for technical and logistical support for the activities related to verification that it intends to carry out. Within 10 days the Parties shall develop and agree upon a coordinated schedule, including specific times and durations for carrying out activities related to verification, that shall ensure the rights of each Party provided in this Protocol.

7. Agreement of the Representative of each Party in the Coordinating Group shall constitute agreement of the Parties with respect to the following specific provisions of this Protocol:

(a) Section I: paragraph 5;

(b) Section IV: paragraphs 9, 10(b), and 11;

(c) Section V: paragraphs 2, 3, 4(b), 6(a), 7, 8(d), 9(f), 10, and 11;

(d) Section VI: paragraphs 2, 3, 4, 5, 6, and 9;

(e) Section VII: paragraphs 1(b) and 2(c);

(f) Section VIII: paragraphs 1(g), 4, 5(b), 5(g), and 8(f);

(g) Section X: paragraphs 4 and 13; and

(h) Section XI: paragraph 6.

8. Upon completion of activities related to verification at the site of an explosion, the Designated Personnel Team Leader shall prepare, at his option, either at the site of the explosion or in the capital of the Party carrying out the explosion, a report of the activities provided for in this Protocol that were carried out by Designated Personnel. The report shall be factual, and shall list the types of activities in chronological order. Lists of information, of photographs, and of data required in accordance with this Protocol and provided by Designated Personnel to the Party carrying out the explosion and received by Designated Personnel from the Party carrying out the explosion in the course of conducting activities related to verification on the territory of the Party carrying out the explosion shall be appended to the report. The report shall be provided to the Party carrying out the explosion in its capital by the Designated Personnel Team Leader within 15 days following completion of activities related to verification at the site of the explosion.

9. If, in the course of implementing activities related to verification in accordance with this Protocol, questions arise requiring prompt resolution, such questions shall be considered by the Coordinating Group. If the Coordinating Group is unable to resolve such questions, they shall immediately be referred to the Joint Consultative Commission for resolution.

10. Within 30 days after the Party carrying out the explosion provides notification of its intent to carry out a group explosion having a planned aggregate yield exceeding 150 kilotons, a meeting of the Joint Consultative Commission shall be convened at the request of either Party with the goal of reaching agreement on specific procedures as specified in paragraph 2 of Section II of this Protocol. The explosion shall be conducted no less than 150 days following agreement of the Parties upon such procedures.

11. The Joint Consultative Commission may, as necessary, establish and amend procedures governing the activities of the Coordinating Group.

SECTION XII. RELEASE OF INFORMATION

1. Nothing in the Treaty and this Protocol shall affect the proprietary rights of either Party in information provided by it in accordance with the Treaty and this Protocol, or in information that may be disclosed to the other Party or that may become known to the other Party in preparing for, or carrying out, explosions. Claims to such proprietary rights, however, shall not impede implementation of the provisions of the Treaty and this Protocol.

2. Public release of the information provided in accordance with this Protocol or publication of material using such information may take place only with the agreement of the Party carrying out an explosion. Public release of the results of observation or measurements made by Designated Personnel may take place only with the agreement of both Parties.

SECTION XIII. ENTRY INTO FORCE

This Protocol is an integral part of the Treaty. It shall enter into force on the date of entry into force of the Treaty and shall remain in force as long as the Treaty remains in force.

DONE at Washington, in duplicate, this first day of June, 1990, in the English and Russian languages, both texts being equally authentic.

FOR THE UNITED STATES OF AMERICA:

President of the United States of America

FOR THE UNION OF SOVIET SOCIALIST REPUBLICS:

President of the Union of Soviet Socialist Republics

CONFERENCE ON DISARMAMENT

CD/1068
8 March 1991

ENGLISH
Original: RUSSIAN

LETTER DATED 28 FEBRUARY 1991 FROM THE REPRESENTATIVE OF THE UNION OF SOVIET SOCIALIST REPUBLICS ADDRESSED TO THE PRESIDENT OF THE CONFERENCE ON DISARMAMENT TRANSMITTING THE TEXT OF THE 1974 TREATY BETWEEN THE UNION OF SOVIET SOCIALIST REPUBLICS AND THE UNITED STATES OF AMERICA ON THE LIMITATION OF UNDERGROUND NUCLEAR WEAPON TESTS, TOGETHER WITH THE PROTOCOL THERETO */

I have the honour to forward to you the 1974 Treaty between the Union of Soviet Socialist Republics and the United States of America on the Limitation of Underground Nuclear Weapon Tests, together with the Protocol thereto, which entered into force following the exchange on instruments of ratification on 11 December 1990.

In accordance with past practice, the representative of the United States at the Conference on Disarmament, Ambassador S. Ledogar, will transmit these documents to the Conference on Disarmament in English.

Please take the appropriate steps to issue the text of this Treaty and the Protocol as official documents of the Conference on Disarmament, and to distribute them to the delegations of all member States of the Conference and non-member States of the Conference which are participating in the Conference's work.

(Signed) S. BATSANOV

Representative of the USSR at the Conference on Disarmament

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*/ The official English text of the above-mentioned Treaty together with the Protocol thereto is to be found in CD/1066.

CONFERENCE ON DISARMAMENT

CD/1069
8 March 1991

ENGLISH
Original: RUSSIAN

LETTER DATED 28 FEBRUARY 1991 FROM THE REPRESENTATIVE OF THE UNION OF SOVIET SOCIALIST REPUBLICS ADDRESSED TO THE PRESIDENT OF THE CONFERENCE ON DISARMAMENT TRANSMITTING THE TEXT OF THE 1976 TREATY BETWEEN THE UNION OF SOVIET SOCIALIST REPUBLICS AND THE UNITED STATES OF AMERICA ON UNDERGROUND NUCLEAR EXPLOSIONS FOR PEACEFUL PURPOSES, TOGETHER WITH THE PROTOCOL THERETO */

I have the honour to forward to you the 1976 Treaty between the Union of Soviet Socialist Republics and the United States of America on Underground Nuclear Explosions for Peaceful Purposes, together with the Protocol thereto, which entered into force following the exchange on instruments of ratification on 11 December 1990.

In accordance with past practice, the representative of the United States at the Conference on Disarmament, Ambassador S. Ledogar, will transmit these documents to the Conference on Disarmament in English.

Please take the appropriate steps to issue the text of this Treaty and the Protocol as official documents of the Conference on Disarmament, and to distribute them to the delegations of all member States of the Conference and non-member States of the Conference which are participating in the Conference's work.

(Signed) S. BATSANOV

Representative of the USSR at the Conference on Disarmament

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*/ The official English text of the above-mentioned Treaty together with the Protocol thereto is to be found in CD/1067.

CONFERENCE ON DISARMAMENT

CD/1070/Corr.1
15 April 1991

ENGLISH ONLY

LETTER DATED 25 FEBRUARY 1991 FROM THE PERMANENT REPRESENTATIVE OF AUSTRIA ADDRESSED TO THE SECRETARY-GENERAL OF THE CONFERENCE ON DISARMAMENT TRANSMITTING THE TEXT OF THE "VIENNA DOCUMENT 1990 OF THE NEGOTIATIONS ON CONFIDENCE- AND SECURITY-BUILDING MEASURES CONVENED IN ACCORDANCE WITH THE RELEVANT PROVISIONS OF THE CONCLUDING DOCUMENT OF THE VIENNA MEETING OF THE CONFERENCE ON SECURITY AND CO-OPERATION IN EUROPE"

Corrigendum

In the mast-head, the symbol block on document CD/1070 should read:

CD/1070
4 March 1991

ENGLISH
Original: ENGLISH, FRENCH, RUSSIAN AND SPANISH ONLY

GE.91-60637

CONFERENCE ON DISARMAMENT

CD/1070
4 March 1991

Original: ARABIC, CHINESE, ENGLISH, FRENCH, RUSSIAN AND SPANISH

LETTER DATED 25 FEBRUARY 1991 FROM THE PERMANENT REPRESENTATIVE OF AUSTRIA ADDRESSED TO THE SECRETARY-GENERAL OF THE CONFERENCE ON DISARMAMENT TRANSMITTING THE TEXT OF THE "VIENNA DOCUMENT 1990 OF THE NEGOTIATIONS ON CONFIDENCE- AND SECURITY-BUILDING MEASURES CONVENED IN ACCORDANCE WITH THE RELEVANT PROVISIONS OF THE CONCLUDING DOCUMENT OF THE VIENNA MEETING OF THE CONFERENCE ON SECURITY AND CO-OPERATION IN EUROPE"

I have the honour to forward to you a copy of the "VIENNA DOCUMENT 1990 of the Negotiations on Confidence- and Security-Building Measures convened in accordance with the relevant provisions of the Concluding Document of the Vienna Meeting of the Conference on Security and Co-operation in Europe" and would be grateful for its circulation as an official document of the Conference on Disarmament.

Accept, Sir, the assurances of my highest consideration.

(Signed) Franz Ceska
Ambassador
Permanent Representative

VIENNA DOCUMENT 1990

OF THE NEGOTIATIONS ON CONFIDENCE- AND SECURITY-BUILDING MEASURES CONVENED IN ACCORDANCE WITH THE RELEVANT PROVISIONS OF THE CONCLUDING DOCUMENT OF THE VIENNA MEETING OF THE CONFERENCE ON SECURITY AND CO-OPERATION IN EUROPE

VIENNA 1990

VIENNA DOCUMENT 1990

OF THE NEGOTIATIONS ON CONFIDENCE- AND SECURITY-BUILDING MEASURES CONVENED IN ACCORDANCE WITH THE RELEVANT PROVISIONS OF THE CONCLUDING DOCUMENT OF THE VIENNA MEETING OF THE CONFERENCE ON SECURITY AND CO-OPERATION IN EUROPE

(1) The representatives of the participating States of the Conference on Security and Co-operation in Europe (CSCE), Austria, Belgium, Bulgaria, Canada, Cyprus, Czech and Slovak Federal Republic, Denmark, Finland, France, Germany, Greece, the Holy See, Hungary, Iceland, Ireland, Italy, Liechtenstein, Luxembourg, Malta, Monaco, the Netherlands, Norway, Poland, Portugal, Romania, San Marino, Spain, Sweden, Switzerland, Turkey, the Union of Soviet Socialist Republics, the United Kingdom, the United States of America and Yugoslavia, met in Vienna from 9 March 1989, in accordance with the provisions relating to the Conference on Confidence- and Security-Building Measures and Disarmament in Europe contained in the Concluding Documents of the Madrid and Vienna Follow-up Meetings of the CSCE.

(2) The participating States recalled that the aim of the Conference on Confidence- and Security-Building Measures and Disarmament in Europe is, as a substantial and integral part of the multilateral process initiated by the Conference on Security and Co-operation in Europe, to undertake, in stages, new, effective and concrete actions designed to make progress in strengthening confidence and security and in achieving disarmament, so as to give effect and expression to the duty of States to refrain from the threat or use of force in their mutual relations as well as in their international relations in general.

(3) Opening statements were made by the Ministers of Foreign Affairs and other Heads of Delegation.

(4) From 16 January to 5 February 1990, the participating States held discussions in a seminar setting on military doctrine in relation to the posture, structure and activities of conventional forces in the zone of application for confidence- and security-building measures*. Encouraged by the course of these discussions, the participating States decided to hold a second seminar on military doctrine in the spring of 1991 in Vienna.

(5) The participating States have adopted the present document which integrates a set of new confidence- and security-building measures with measures adopted in the Document of the Stockholm Conference which have been further developed in the light of experience gained.

(6) The participating States recognised that the mutually complementary confidence- and security-building measures which are adopted in the present document and which are in accordance with the mandates of the Madrid and Vienna Follow-up Meetings of the CSCE serve by their scope and nature and by their implementation to strengthen confidence and security in Europe.

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* Annex I

(7) The participating States also recognised that the negotiations will continue in accordance with the mandates of the Madrid and Vienna Follow-up Meetings of the CSCE in order to further build upon and expand the results already achieved and that proposals which have been submitted remain subject to further negotiations.

(8) The participating States recalled the declaration on Refraining from the Threat or Use of Force contained in paragraphs (9) to (27) of the Document of the Stockholm Conference and stressed its continuing validity as seen in the light of the Charter of Paris for a New Europe.

(9) The participating States have adopted the following:

I. ANNUAL EXCHANGE OF MILITARY INFORMATION

INFORMATION ON MILITARY FORCES

(10) The participating States will exchange annually information on their military forces concerning the military organization, manpower and major weapon and equipment systems, as specified below, in the zone of application for confidence- and security-building measures (CSBMs).

(11) The information will be provided in an agreed format to all other participating States not later than 15 December of each year. It will be valid as of 1 January of the following year and will include:

(11.1) 1. Information on the command organisation of those military forces referred to under points 2 and 3 specifying the designation and subordination of all formations* and units** at each level of command down to and including brigade/regiment or equivalent level.

(11.2) 2. For each formation and combat unit*** of land forces down to and including brigade/regiment or equivalent level the information will indicate:

(11.2.1) — the designation and subordination;

(11.2.2) — whether it is active or non-active****;

(11.2.3) — the normal peacetime location of its headquarters indicated by exact geographic terms and/or co-ordinates;

(11.2.4) — the peacetime authorised personnel strength;

(11.2.5) — the major organic weapon and equipment systems, specifying the numbers of each type of:

(11.2.5.1) — battle tanks;

(11.2.5.2) — helicopters;

(11.2.5.3) — armoured combat vehicles;

(11.2.5.4) — anti-tank guided missile launchers permanently/integrally mounted on armoured vehicles;

(11.2.5.5) — self-propelled and towed artillery pieces, mortars and multiple rocket launchers (100 mm calibre and above);

(11.2.5.6) — armoured vehicle launched bridges.

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* In this context, formations are armies, corps and divisions and their equivalents.

** In this context, units are brigades, regiments and their equivalents.

*** In this context, combat units are infantry, armoured, mechanised, motorised rifle, artillery, combat engineer and army aviation units. Those combat units which are airmobile or airborne will also be included.

**** In this context, non-active formations or combat units are those manned from zero to fifteen per cent of their authorised combat strength. This term includes low strength formations and units.

(11.3) For each amphibious formation and amphibious combat unit* permanently located in the zone of application down to and including brigade/regiment or equivalent level, the information will include the items as set out above.

(11.4) 3. For each air formation and air combat unit** of the air forces, air defence aviation and of naval aviation permanently based on land down to and including wing/air regiment or equivalent level the information will include:

(11.4.1) — the designation and subordination;

(11.4.2) — the normal peacetime location of the headquarters indicated by exact geographic terms and/or co-ordinates;

(11.4.3) — the normal peacetime location of the unit indicated by the air base or military airfield on which the unit is based, specifying:

(11.4.3.1) — the designation or, if applicable, name of the air base or military airfield and

(11.4.3.2) — its location indicated by exact geographic terms and/or co-ordinates;

(11.4.4) — the peacetime authorised personnel strength***;

(11.4.5) — the numbers of each type of:

(11.4.5.1) — combat aircraft;

(11.4.5.2) — helicopters

organic to the formation or unit.

INFORMATION ON PLANS FOR THE DEPLOYMENT OF MAJOR WEAPON AND EQUIPMENT SYSTEMS

(12) The participating States will exchange annually information on their plans for the deployment of major weapon and equipment systems as specified in the provisions on Information on Military Forces within the zone of application for CSBMs.

(13) The information will be provided in an agreed format to all other participating States not later than 15 December of each year. It will cover plans for the following year and will include:

(13.1) — the type and name of the weapon/equipment systems to be deployed;

(13.2) — the total number of each weapon/equipment system;

(13.3) — whenever possible, the number of each weapon/equipment system planned to be allocated to each formation or unit;

(13.4) — the extent to which the deployment will add to or replace existing weapon/equipment systems.

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* Combat unit as defined above.

** In this context, air combat units are units, the majority of whose organic aircraft are combat aircraft.

*** As an exception, this information need not be provided on air defence aviation units.

INFORMATION ON MILITARY BUDGETS

(14) The participating States will exchange annually information on their military budgets for the forthcoming fiscal year, itemising defence expenditures on the basis of the categories set out in the United Nations "Instrument for Standardised International Reporting of Military Expenditures" adopted on 12 December 1980.

(15) The information will be provided to all other participating States not later than two months after the military budget has been approved by the competent national authorities.

(16) Each participating State may ask for clarification from any other participating State of the budgetary information provided. Questions should be submitted within a period of two months following the receipt of a participating State's budgetary information. Participating States will make every effort to answer such questions fully and promptly. The questions and replies may be transmitted to all other participating States.

II. RISK REDUCTION

MECHANISM FOR CONSULTATION AND CO-OPERATION AS REGARDS UNUSUAL MILITARY ACTIVITIES

(17) Participating States will, in accordance with the following provisions, consult and co-operate with each other about any unusual and unscheduled activities of their military forces outside their normal peacetime locations which are militarily significant, within the zone of application for CSBMs and about which a participating State expresses its security concern.

(17.1) The participating State which has concerns about such an activity may transmit a request for an explanation to another participating State where the activity is taking place.

(17.1.1) The request will state the cause, or causes, of the concern and, to the extent possible, the type and location, or area, of the activity.

(17.1.2) The reply will be transmitted within not more than 48 hours.

(17.1.3) The reply will give answers to questions raised, as well as any other relevant information which might help to clarify the activity giving rise to concern.

(17.1.4) The request and the reply will be transmitted to all other participating States without delay.

(17.2) The requesting State, after considering the reply provided, may then request a meeting to discuss the matter.

(17.2.1) The requesting State may ask for a meeting with the responding State.

(17.2.1.1) Such a meeting will be convened within not more than 48 hours.

(17.2.1.2) The request for such a meeting will be transmitted to all participating States without delay.

(17.2.1.3) The responding State is entitled to ask other interested participating States, in particular those which might be involved in the activity, to participate in the meeting.

(17.2.1.4) Such a meeting will be held at a venue to be mutually agreed upon by the requesting and the responding States. If there is no agreement, the meeting will be held at the Conflict Prevention Centre.

(17.2.1.5) The requesting and responding States will, jointly or separately, transmit a report of the meeting to all other participating States without delay.

(17.2.2) The requesting State may ask for a meeting of all participating States.

(17.2.2.1) Such a meeting will be convened within not more than 48 hours.

(17.2.2.2) The Conflict Prevention Centre will serve as the forum for such a meeting.

(17.2.2.3) Participating States involved in the matter to be discussed undertake to be represented at such a meeting.

(17.3) The communications between participating States provided for above will be transmitted preferably through the CSBM communications network.

CO-OPERATION AS REGARDS HAZARDOUS INCIDENTS OF A MILITARY NATURE

(18) Participating States will co-operate by reporting and clarifying hazardous incidents of a military nature within the zone of application for CSBMs in order to prevent possible misunderstandings and mitigate the effects on another participating State.

(18.1) Each participating State will designate a point to contact in case of such hazardous incidents and will so inform all other participating States. A list of such points will be kept available at the Conflict Prevention Centre.

(18.2) In the event of such a hazardous incident the participating State whose military forces are involved in the incident should provide the information available to other participating States in an expeditious manner. Any participating State affected by such an incident may also request clarification as appropriate. Such requests will receive a prompt response.

(18.3) Communications between participating States will be transmitted preferably through the CSBM communications network.

(18.4) Matters relating to information about such hazardous incidents may be discussed by participating States at the Conflict Prevention Centre, either at the annual implementation assessment meeting at the Centre, or at additional meetings convened there.

(18.5) These provisions will not affect the rights and obligations of participating States under any international agreement concerning hazardous incidents, nor will they preclude additional methods of reporting and clarifying hazardous incidents.

III. CONTACTS

VISITS TO AIR BASES

(19) Each participating State with air combat units reported under paragraph (11) will arrange visits for representatives of all other participating States to one of its normal peacetime air bases* on which such units are located in order to provide the visitors with the opportunity to view activity at the air base, including preparations to carry out the functions of the air base and to gain an impression of the approximate number of air sorties and type of missions being flown.

(20) No participating State will be obliged to arrange more than one such visit in any five-year period.

(21) Prior indications given by participating States of forthcoming schedules for such visits for the subsequent year(s) may be discussed at the annual implementation assessment meetings.

(22) As a rule, up to two visitors from each participating State will be invited.

(23) Invitations will be extended to all participating States 42 days or more in advance of the visit. The invitation will indicate a preliminary programme, including: place, date and time of assembly; planned duration; languages to be used; arrangements for board, lodging and transportation; equipment permitted to be used during the visit; and any other information that may be considered useful.

(24) When the air base to be visited is located on the territory of another participating State, the invitations will be issued by the participating State on whose territory the air base is located. In such cases, the responsibilities as host delegated by this State to the participating State arranging the visit will be specified in the invitation.

(25) Replies to the invitation, indicating the names and ranks of the visitors, will be given not later than 21 days after the issue of the invitation. If the invitation is not accepted in time, it will be assumed that no visitors will be sent.

(26) The visit to the air base will last for a minimum of 24 hours.

(27) In the course of the visit, the visitors will be given a briefing on the purpose and functions of the air base and on current activity at the air base. They will have the opportunity to communicate with commanders and troops, including those of support/logistic units located at the air base.

(28) The visitors will be provided with the opportunity to view all types of aircraft located at the air base.

(29) At the close of the visit, the host State will provide an opportunity for the visitors to meet together and with host State officials and senior air base personnel to discuss the course of the visit.

(30) The host State will determine the programme for the visit and access granted to visitors at the air base.

(31) The visitors will follow the instructions issued by the host State in accordance with the provisions set out in this document.

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* In this context, the term normal peacetime air base is understood to mean the normal peacetime location of the air combat unit indicated by the air base or military airfield on which the unit is based.

(32) The visitors will be provided with appropriate accommodation in a location suitable for carrying out the visit.

(33) The invited State will cover the travel expenses of its representatives to and from the place of assembly specified in the invitation.

(34) Participating States should, in due co-operation with the visitors, ensure that no action is taken which could be harmful to the safety of visitors.

MILITARY CONTACTS

(35) To improve further their mutual relations in the interest of strengthening the process of confidence and security building, the participating States will, as appropriate, promote and facilitate:

(35.1) — exchanges and visits between senior military/defence representatives;

(35.2) — contacts between relevant military institutions;

(35.3) — attendance by military representatives of other participating States at courses of instruction;

(35.4) — exchanges between military commanders and officers of commands down to brigade/regiment or equivalent level;

(35.5) — exchanges and contacts between academics and experts in military studies and related areas;

(35.6) — sporting and cultural events between members of their armed forces.

IV. PRIOR NOTIFICATION OF CERTAIN MILITARY ACTIVITIES

(36) The participating States will give notification in writing through diplomatic channels in an agreed form of content, to all other participating States 42 days or more in advance of the start of notifiable* military activities in the zone of application for confidence- and security-building measures (CSBMs).

(37) Notification will be given by the participating State on whose territory the activity in question is planned to take place even if the forces of that State are not engaged in the activity or their strength is below the notifiable level. This will not relieve other participating States of their obligation to give notification, if their involvement in the planned military activity reaches the notifiable level.

(38) Each of the following military activities in the field conducted as a single activity in the zone of application for CSBMs at or above the levels defined below, will be notified:

(38.1) The engagement of formations of land forces** of the participating States in the same exercise activity conducted under a single operational command independently or in combination with any possible air or naval components.

(38.1.1) This military activity will be subject to notification whenever it involves at any time during the activity:
— at least 13,000 troops, including support troops, or
— at least 300 battle tanks
if organized into a divisional structure or at least two brigades/regiments, not necessarily subordinate to the same division.

(38.1.2) The participation of air forces of the participating States will be included in the notification if it is foreseen that in the course of the activity 200 or more sorties by aircraft, excluding helicopters, will be flown.

(38.2) The engagement of military forces either in an amphibious landing or in a parachute assault by airborne forces in the zone of application for CSBMs.

(38.2.1) These military activities will be subject to notification whenever the amphibious landing involves at least 3,000 troops or whenever the parachute drop involves at least 3,000 troops.

(38.3) The engagement of formations of land forces of the participating States in a transfer from outside the zone of application for CSBMs to arrival points in the zone, or from inside the zone of application for CSBMs to points of concentration in the zone, to participate in a notifiable exercise activity or to be concentrated.

(38.3.1) The arrival or concentration of these forces will be subject to notification whenever it involves, at any time during the activity:
— at least 13,000 troops, including support troops, or
— at least 300 battle tanks
if organized into a divisional structure or at least two brigades/regiments, not necessarily subordinate to the same division.

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* In this document, the term notifiable means subject to notification.

** In this context, the term land forces includes amphibious, airmobile and airborne forces.

(38.3.2) Forces which have been transferred into the zone will be subject to all provisions of agreed CSBMs when they depart their arrival points to participate in a notifiable exercise activity or to be concentrated within the zone of application for CSBMs.

(39) Notifiable military activities carried out without advance notice to the troops involved, are exceptions to the requirement for prior notification to be made 42 days in advance.

(39.1) Notification of such activities, above the agreed thresholds, will be given at the time the troops involved commence such activities.

(40) Notification will be given in writing of each notifiable military activity in the following agreed form:

(41) **A — General Information**

(41.1) The designation of the military activity;

(41.2) The general purpose of the military activity;

(41.3) The names of the States involved in the military activity;

(41.4) The level of command, organizing and commanding the military activity;

(41.5) The start and end dates of the military activity.

(42) **B — Information on different types of notifiable military activities**

(42.1) The engagement of formations of land forces of the participating States in the same exercise activity conducted under a single operational command independently or in combination with any possible air or naval components:

(42.1.1) The total number of troops taking part in the military activity (i.e. ground troops, amphibious troops, airmobile and airborne troops) and the number of troops participating for each State involved, if applicable;

(42.1.2) The designation, subordination, number and type of formations and units participating for each State down to and including brigade/regiment or equivalent level;

(42.1.3) The total number of battle tanks for each State and the total number of anti-tank guided missile launchers mounted on armoured vehicles;

(42.1.4) The total number of artillery pieces and multiple rocket launchers (100 mm calibre or above);

(42.1.5) The total number of helicopters, by category;

(42.1.6) Envisaged number of sorties by aircraft, excluding helicopters;

(42.1.7) Purpose of air missions;

(42.1.8) Categories of aircraft involved;

(42.1.9) The level of command, organizing and commanding the air force participation;

(42.1.10) Naval ship-to-shore gunfire;

(42.1.11) Indication of other naval ship-to-shore support;

(42.1.12) The level of command, organizing and commanding the naval force participation.

(42.2) The engagement of military forces either in an amphibious landing or in a parachute assault by airborne forces in the zone of application for CSBMs:

(42.2.1) The total number of amphibious troops involved in notifiable amphibious landings, and/or the total number of airborne troops involved in notifiable parachute assaults;

(42.2.2) In the case of a notifiable amphibious landing, the point or points of embarkation, if in the zone of application for CSBMs.

(42.3) The engagement of formations of land forces of the participating States in a transfer from outside the zone of application for CSBMs to arrival points in the zone, or from inside the zone of application for CSBMs to points of concentration in the zone, to participate in a notifiable exercise activity or to be concentrated:

(42.3.1) The total number of troops transferred;

(42.3.2) Number and type of divisions participating in the transfer;

(42.3.3) The total number of battle tanks participating in a notifiable arrival or concentration;

(42.3.4) Geographical co-ordinates for the points of arrival and for the points of concentration.

(43) **C — The envisaged area and timeframe of the activity**

(43.1) The area of the military activity delimited by geographic features together with geographic co-ordinates, as appropriate;

(43.2) The start and end dates of each phase (transfers, deployment, concentration of forces, active exercise phase, recovery phase) of activities in the zone of application for CSBMs of participating formations, the tactical purpose and corresponding geographical areas (delimited by geographical co-ordinates) for each phase;

(43.3) Brief description of each phase.

(44) **D — Other information**

(44.1) Changes, if any, in relation to information provided in the annual calendar regarding the activity;

(44.2) Relationship of the activity to other notifiable activities.

V. OBSERVATION OF CERTAIN MILITARY ACTIVITIES

(45) The participating States will invite observers from all other participating States to the following notifiable military activities:

(45.1) — The engagement of formations of land forces* of the participating States in the same exercise activity conducted under a single operational command independently or in combination with any possible air or naval components.

(45.2) — The engagement of military forces either in an amphibious landing or in a parachute assault by airborne forces in the zone of application for CSBMs.

(45.3) — In the case of the engagement of formations of land forces of the participating States in a transfer from outside the zone of application for CSBMs to arrival points in the zone, or from inside the zone of application for CSBMs to points of concentration in the zone, to participate in a notifiable exercise activity or to be concentrated, the concentration of these forces. Forces which have been transferred into the zone will be subject to all provisions of agreed confidence- and security-building measures when they depart their arrival points to participate in a notifiable exercise activity or to be concentrated within the zone of application for CSBMs.

(45.4) The above-mentioned activities will be subject to observation whenever the number of troops engaged meets or exceeds 17,000 troops, except in the case of either an amphibious landing or a parachute assault by airborne forces, which will be subject to observation whenever the number of troops engaged meets or exceeds 5,000 troops.

(46) The host State will extend the invitations in writing through diplomatic channels to all other participating States at the time of notification. The host State will be the participating State on whose territory the notified activity will take place.

(47) The host State may delegate some of its responsibilities as host to another participating State engaged in the military activity on the territory of the host State. In such cases, the host State will specify the allocation of responsibilities in its invitation to observe the activity.

(48) Each participating State may send up to two observers to the military activity to be observed.

(49) The invited State may decide whether to send military and/or civilian observers, including members of its personnel accredited to the host State. Military observers will, normally, wear their uniforms and insignia while performing their tasks.

(50) Replies to the invitation will be given in writing not later than 21 days after the issue of the invitation.

(51) The participating States accepting an invitation will provide the names and ranks of their observers in their reply to the invitation. If the invitation is not accepted in time, it will be assumed that no observers will be sent.

(52) Together with the invitation the host State will provide a general observation programme, including the following information:

(52.1) — the date, time and place of assembly of observers;

(52.2) — planned duration of the observation programme;

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* In this context, the term land forces includes amphibious, airmobile and airborne forces.

(52.3) — languages to be used in interpretation and/or translation;

(52.4) — arrangements for board, lodging and transportation of the observers;

(52.5) — arrangements for observation equipment which will be issued to the observers by the host State;

(52.6) — possible authorization by the host State of the use of special equipment that the observers may bring with them;

(52.7) — arrangements for special clothing to be issued to the observers because of weather or environmental factors.

(53) The observers may make requests with regard to the observation programme. The host State will, if possible, accede to them.

(54) The host State will determine a duration of observation which permits the observers to observe a notifiable military activity from the time that agreed thresholds for observation are met or exceeded until, for the last time during the activity, the thresholds for observation are no longer met.

(55) The host State will provide the observers with transportation to the area of the notified activity and back. This transportation will be provided from either the capital or another suitable location to be announced in the invitation, so that the observers are in position before the start of the observation programme.

(56) The invited State will cover the travel expenses for its observers to the capital, or another suitable location specified in the invitation, of the host State, and back.

(57) The observers will be provided equal treatment and offered equal opportunities to carry out their functions.

(58) The observers will be granted, during their mission, the privileges and immunities accorded to diplomatic agents in the Vienna Convention on Diplomatic Relations.

(59) The participating States will ensure that official personnel and troops taking part in an observed military activity, as well as other armed personnel located in the area of the military activity, are adequately informed regarding the presence, status and functions of observers. Participating States should, in due co-operation with the observers, ensure that no action is taken which could be harmful to the safety of observers.

(60) The host State will not be required to permit observation of restricted locations, installations or defence sites.

(61) In order to allow the observers to confirm that the notified activity is non-threatening in character and that it is carried out in conformity with the appropriate provisions of the notification, the host State will:

(61.1) — at the commencement of the observation programme give a briefing on the purpose, the basic situation, the phases of the activity and possible changes as compared with the notification and provide the observers with an observation programme with a daily schedule;

(61.2) — provide the observers with a map with a scale of 1 to not more than 250,000 depicting the area of the notified military activity and the initial tactical situation in this area. To depict the entire area of the notified military activity, smaller-scale maps may be additionally provided;

(61.3) — provide the observers with appropriate observation equipment; in addition, the observers will be permitted to use their own binoculars, maps, photo and video cameras, dictaphones and hand-held passive night-vision devices. The above-mentioned equipment will be subject to examination and approval by the host State. It is understood that the host State may limit the use of certain equipment in restricted locations, installations or defence sites;

(61.4) — be encouraged, whenever feasible and with due consideration for the security of the observers, to provide an aerial survey, preferably by helicopter, of the area of the military activity. If carried out, such a survey should provide the observers with the opportunity to observe from the air the disposition of forces engaged in the activity in order to help them gain a general impression of its scope and scale. At least one observer from each participating State represented at the observation should be given the opportunity to participate in the survey. Helicopters and/or aircraft may be provided by the host State or by another participating State at the request of and in agreement with the host State;

(61.5) — in the course of the observation programme give the observers daily briefings with the help of maps on the various phases of the military activity and their development and inform the observers about their positions geographically; in the case of a land force activity conducted in combination with air or naval components, briefings will be given by representatives of these forces;

(61.6) — provide opportunities to observe directly forces of the State(s) engaged in the military activity so that the observers get an impression of the flow of the entire activity; to this end, the observers will be given the opportunity to observe combat and support units of all participating formations of a divisional or equivalent level and, whenever possible, to visit units below divisional or equivalent level and communicate with commanders and troops. Commanders and other senior personnel of the participating formations as well as of the visited units will inform the observers of the mission and disposition of their respective units;

(61.7) — guide the observers in the area of the military activity; the observers will follow the instructions issued by the host State in accordance with the provisions set out in this document;

(61.8) — provide the observers with appropriate means of transportation in the area of the military activity;

(61.9) — provide the observers with opportunities for timely communication with their embassies or other official missions and consular posts; the host State is not obligated to cover the communication expense of the observers;

(61.10) — provide the observers with appropriate board and lodging in a location suitable for carrying out the observation programme and, when necessary, medical care;

(61.11) — at the close of each observation, provide an opportunity for the observers to meet together and with host State officials to discuss the course of the observed activity. Where States other than the host State have been engaged in the activity, military representatives of those States will also be invited to take part in this discussion.

(62) The participating States need not invite observers to notifiable military activities which are carried out without advance notice to the troops involved unless these notifiable activities have a duration of more than 72 hours. The continuation of these activities beyond this time will be subject to observation while the agreed thresholds for observation are met or exceeded. The observation programme will follow as closely as practically possible all the provisions for observation set out in this document.

(63) The participating States are encouraged to permit media representatives from all participating States to attend observed military activities in accordance with accreditation procedures set down by the host State. In such instances, media representatives from all participating States will be treated without discrimination and given equal access to those facets of the activity open to media representatives.

(64) The presence of media representatives will not interfere with the observers carrying out their functions nor with the flow of the military activity.

VI. ANNUAL CALENDARS

(65) Each participating State will exchange, with all other participating States, an annual calendar of its military activities subject to prior notification*, within the zone of application for CSBMs, forecast for the subsequent calendar year. A participating State which is to host military activities subject to prior notification conducted by any other participating State(s) will include these activities in its annual calendar. It will be transmitted every year, in writing, through diplomatic channels, not later than 15 November for the following year.

(66) If a participating State does not forecast any military activity subject to prior notification it will so inform all other participating States in the same manner as prescribed for the exchange of annual calendars.

(67) Each participating State will list the above-mentioned activities chronologically and will provide information on each activity in accordance with the following model:

(67.1) — type of military activity and its designation;

(67.2) — general characteristics and purpose of the military activity;

(67.3) — States involved in the military activity;

(67.4) — area of the military activity, indicated by geographic features where appropriate and defined by geographic co-ordinates;

(67.5) — planned duration of the military activity, indicated by envisaged start and end dates;

(67.6) — the envisaged total number of troops* engaged in the military activity. For activities involving more than one State, the host State will provide such information for each State involved;

(67.7) — the types of armed forces involved in the military activity;

(67.8) — the envisaged level of the military activity and designation of direct operational command, under which this military activity will take place;

(67.9) — the number and type of divisions whose participation in the military activity is envisaged;

(67.10) — any additional information concerning, *inter alia,* components of armed forces, which the participating State planning the military activity considers relevant.

(68) Should changes regarding the military activities in the annual calendar prove necessary, they will be communicated to all other participating States no later than in the appropriate notification.

(69) Should a participating State cancel a military activity included in its annual calendar or reduce it to a level below notification thresholds, that State will inform the other participating States immediately.

(70) Information on military activities subject to prior notification not included in an annual calendar will be communicated to all participating States as soon as possible, in accordance with the model provided in the annual calendar.

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* as defined in the provisions on Prior Notification of Certain Military Activities.

VII. CONSTRAINING PROVISIONS

(71) Each participating State will communicate, in writing, to all other participating States, by 15 November each year, information concerning military activities subject to prior notification* involving more than 40,000 troops*, which it plans to carry out or host in the second subsequent calendar year. Such communication will include preliminary information on each activity, as to its general purpose, timeframe and duration, area, size and States involved.

(72) Participating States will not carry out military activities subject to prior notification involving more than 40,000 troops, unless they have been the object of communication as defined above.

(73) Participating States will not carry out military activities subject to prior notification involving more than 40,000 troops unless they have been included in the annual calendar, not later than 15 November each year.

(74) If military activities subject to prior notification are carried out in addition to those contained in the annual calendar, they should be as few as possible.

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* as defined in the provisions on Prior Notification of Certain Military Activities.

VIII. COMPLIANCE AND VERIFICATION

(75) According to the Madrid Mandate, the confidence- and security-building measures to be agreed upon "will be provided with adequate forms of verification which correspond to their content".

(76) The participating States recognize that national technical means can play a role in monitoring compliance with agreed confidence- and security-building measures.

INSPECTION

(77) In accordance with the provisions contained in this document each participating State has the right to conduct inspections on the territory of any other participating State within the zone of application for CSBMs.

(78) Any participating State will be allowed to address a request for inspection to another participating State on whose territory, within the zone of application for CSBMs, compliance with the agreed confidence- and security-building measures is in doubt.

(79) No participating State will be obliged to accept on its territory within the zone of application for CSBMs, more than three inspections per calendar year.

(80) No participating State will be obliged to accept more than one inspection per calendar year from the same participating State.

(81) An inspection will not be counted if, due to force majeure, it cannot be carried out.

(82) The participating State which requests an inspection will state the reasons for such a request.

(83) The participating State which has received such a request will reply in the affirmative to the request within the agreed period of time, subject to the provisions contained in paragraphs (79) and (80).

(84) Any possible dispute as to the validity of the reasons for a request will not prevent or delay the conduct of an inspection.

(85) The participating State which requests an inspection will be permitted to designate for inspection on the territory of another State within the zone of application for CSBMs, a specific area. Such an area will be referred to as the "specified area". The specified area will comprise terrain where notifiable military activities are conducted or where another participating State believes a notifiable military activity is taking place. The specified area will be defined and limited by the scope and scale of notifiable military activities but will not exceed that required for an army level military activity.

(86) In the specified area the representatives of the inspecting State accompanied by the representatives of the receiving State will be permitted access, entry and unobstructed survey, except for areas or sensitive points to which access is normally denied or restricted, military and other defence installations, as well as naval vessels, military vehicles and aircraft. The number and extent of the restricted areas should be as limited as possible. Areas where notifiable military activities can take place will not be declared restricted areas, except for certain permanent or temporary military installations which, in territorial terms, should be as small as possible, and consequently those areas will not be used to prevent inspection of notifiable military activities. Restricted areas will not be employed in a way inconsistent with the agreed provisions on inspection.

(87) Within the specified area, the forces of participating States other than the receiving State will also be subject to the inspection conducted by the inspecting State.

(88) Inspection will be permitted on the ground, from the air, or both.

(89) The representatives of the receiving State will accompany the inspection team, including when it is in land vehicles and an aircraft from the time of their first employment until the time they are no longer in use for the purposes of inspection.

(90) In its request, the inspecting State will notify the receiving State of:

(90.1) — the reasons for the request;

(90.2) — the location of the specified area defined by geographical co-ordinates;

(90.3) — the preferred point(s) of entry for the inspection team;

(90.4) — mode of transport to and from the point(s) of entry and, if applicable, to and from the specified area;

(90.5) — where in the specified area the inspection will begin;

(90.6) — whether the inspection will be conducted from the ground, from the air, or both simultaneously;

(90.7) — whether aerial inspection will be conducted using an airplane, a helicopter, or both;

(90.8) — whether the inspection team will use land vehicles provided by the receiving State or, if mutually agreed, its own vehicles;

(90.9) — information for the issuance of diplomatic visas to inspectors entering the receiving State.

(91) The reply to the request will be given in the shortest possible period of time, but within not more than twenty-four hours. Within thirty-six hours after the issuance of the request, the inspection team will be permitted to enter the territory of the receiving State.

(92) Any request for inspection as well as the reply thereto will be communicated to all participating States without delay.

(93) The receiving State should designate the point(s) of entry as close as possible to the specified area. The receiving State will ensure that the inspection team will be able to reach the specified area without delay from the point(s) of entry.

(94) All participating States will facilitate the passage of the inspection teams through their territory.

(95) Within 48 hours after the arrival of the inspection team at the specified area, the inspection will be terminated.

(96) There will be no more than four inspectors in an inspection team. While conducting the inspection the inspection team may divide into two parts.

(97) The inspectors and, if applicable, auxiliary personnel, will be granted during their mission the privileges and immunities in accordance with the Vienna Convention on Diplomatic Relations.

(98) The participating States will ensure that troops, other armed personnel and officials in the specified area are adequately informed regarding the presence, status and functions of inspectors and, if applicable, auxiliary personnel. The receiving State will ensure that no action is taken by its representatives which could endanger inspectors and, if applicable, auxiliary personnel. In carrying out their duties, inspectors and, if applicable, auxiliary personnel will take into account safety concerns expressed by representatives of the receiving State.

(99) The receiving State will provide the inspection team with appropriate board and lodging in a location suitable for carrying out the inspection, and, when necessary, medical care; however this does not exclude the use by the inspection team of its own tents and rations.

(100) The inspection team will have use of its own maps and charts, photo and video cameras, binoculars, hand-held passive night-vision devices and dictaphones. Upon arrival in the specified area the inspection team will show the equipment to the representatives of the receiving State.

(101) The inspection team will have access to appropriate telecommunications equipment of the receiving State for the purpose of communicating with its embassy or other official missions and consular posts accredited to the receiving State.

(102) The receiving State will provide the inspection team with access to appropriate telecommunications equipment for the purpose of continuous communication between the sub-teams.

(103) Inspectors will be entitled to request and to receive briefings at agreed times by military representatives of the receiving State. At the inspectors' request, such briefings will be given by commanders of formations or units in the specified area. Suggestions of the receiving State as to the briefings will be taken into consideration.

(104) The inspecting State will specify whether aerial inspection will be conducted using an airplane, a helicopter or both. Aircraft for inspection will be chosen by mutual agreement between the inspecting and receiving States. Aircraft will be chosen which provide the inspection team a continuous view of the ground during the inspection.

(105) After the flight plan, specifying, *inter alia,* the inspection team's choice of flight path, speed and altitude in the specified area, has been filed with the competent air traffic control authority the inspection aircraft will be permitted to enter the specified area without delay. Within the specified area, the inspection team will, at its request, be permitted to deviate from the approved flight plan to make specific observations provided such deviation is consistent with paragraph (86) as well as flight safety and air traffic requirements. Directions to the crew will be given through a representative of the receiving State on board the aircraft involved in the inspection.

(106) One member of the inspection team will be permitted, if such a request is made, at any time to observe data on navigational equipment of the aircraft and to have access to maps and charts used by the flight crew for the purpose of determining the exact location of the aircraft during the inspection flight.

(107) Aerial and ground inspectors may return to the specified area as often as desired within the 48-hour inspection period.

(108) The receiving State will provide for inspection purposes land vehicles with cross country capability. Whenever mutually agreed taking into account the specific geography relating to the area to be inspected, the inspecting State will be permitted to use its own vehicles.

(109) If land vehicles or aircraft are provided by the inspecting State, there will be one accompanying driver for each land vehicle, or accompanying aircraft crew.

(110) The inspecting State will prepare a report of its inspection and will provide a copy of that report to all participating States without delay.

(111) The inspection expenses will be incurred by the receiving State except when the inspecting State uses its own aircraft and/or land vehicles. The travel expenses to and from the point(s) of entry will be borne by the inspecting State.

EVALUATION

(112) Information provided under the provisions on Information on Military Forces and on Information on Plans for the Deployment of Major Weapon and Equipment Systems will be subject to evaluation.

(113) Subject to the provisions below each participating State will provide the opportunity to visit active formations and units in their normal peacetime locations as specified in point 2 and 3 of the provisions on Information on Military Forces to allow the other participating States to evaluate the information provided.

(114) Each participating State will be obliged to accept a quota of one evaluation visit per calendar year for every sixty units, or portion thereof, reported under paragraph (11). However, no participating State will be obliged to accept more than fifteen visits per calendar year. No participating State will be obliged to accept more than one fifth of its quota of visits from the same participating State; a participating State with a quota of less than five visits will not be obliged to accept more than one visit from the same participating State during a calendar year. No formation or unit may be visited more than twice during a calendar year and more than once by the same participating State during a calendar year.

(115) No participating State will be obliged to accept more than one visit at any given time on its territory.

(116) If a participating State has formations or units stationed on the territory of other participating States (host States) in the zone of application for CSBMs, the maximum number of evaluation visits permitted to its forces in each of the States concerned will be proportional to the number of its units in each State. The application of this provision will not alter the number of visits this participating State (stationing State) will have to accept under paragraph (114).

(117) Requests for such visits will be submitted giving 5 days notice.

(118) The request will specify:

(118.1) — the formation or unit to be visited;

(118.2) — the proposed date of the visit;

(118.3) — the preferred point(s) of entry as well as the date and estimated time of arrival for the evaluation team;

(118.4) — the mode of transport to and from the point(s) of entry and, if applicable, to and from the formation or unit to be visited;

(118.5) — the names and ranks of the members of the team and, if applicable, information for the issue of diplomatic visas.

(119) If a formation or unit of a participating State is stationed on the territory of another participating State, the request will be addressed to the host State and sent simultaneously to the stationing State.

(120) The reply to the request will be given within 48 hours after the receipt of the request.

(121) In the case of formations or units of a participating State stationed on the territory of another participating State, the reply will be given by the host State in consultation with the stationing State. After consultation between the host State and the stationing State, the host State will specify in its reply any of its responsibilities which it agrees to delegate to the stationing State.

(122) The reply will indicate whether the formation or unit will be available for evaluation at the proposed date at its normal peacetime location.

(123) Formations or units may be in their normal peacetime location but be unavailable for evaluation. Each participating State will be entitled in such cases not to accept a visit; the reasons for the non-acceptance and the number of days that the formation or unit will be unavailable for evaluation will be stated in the reply. Each participating State will be entitled to invoke this provision up to a total of five times for an aggregate of no more than 30 days per calendar year.

(124) If the formation or unit is absent from its normal peacetime location, the reply will indicate the reasons for and the duration of its absence. The requested State may offer the possibility of a visit to the formation or unit outside its normal peacetime location. If the requested State does not offer this possibility, the requesting State will be able to visit the normal peacetime location of the formation or unit. The requesting State may however refrain in either case from the visit.

(125) Visits will not be counted against the quotas of receiving States, if they are not carried out. Likewise, if visits are not carried out, due to force majeure, they will not be counted.

(126) The reply will designate the point(s) of entry and indicate, if applicable, the time and place of assembly of the team. The point(s) of entry and, if applicable, the place of assembly will be designated as close as possible to the formation or unit to be visited. The receiving State will ensure that the team will be able to reach the formation or unit without delay.

(127) The request and the reply will be communicated to all participating States without delay.

(128) Participating States will facilitate the passage of teams through their territory.

(129) The team will have no more than two members. It may be accompanied by an interpreter as auxiliary personnel.

(130) The members of the team and, if applicable, auxiliary personnel, will be granted during their mission the privileges and immunities in accordance with the Vienna Convention on Diplomatic Relations.

(131) The visit will take place in the course of a single working day and last up to 12 hours.

(132) The visit will begin with a briefing by the officer commanding the formation or unit, or his deputy, in the headquarters of the formation or unit, concerning the personnel as well as the major weapon and equipment systems reported under paragraph (11).

(132.1) In the case of a visit to a formation, the receiving State may provide the possibility to see personnel and major weapon and equipment systems reported under paragraph (11) for that formation, but not for any of its formations or units, in their normal locations.

(132.2) In the case of a visit to a unit, the receiving State will provide the possibility to see the personnel and the major weapon and equipment systems of the unit reported under paragraph (11) in their normal locations.

(133) Access will not have to be granted to sensitive points, facilities and equipment.

(134) The team will be accompanied at all times by representatives of the receiving State.

(135) The receiving State will provide the team with appropriate transportation during the visit to the formation or unit.

(136) Personal binoculars and dictaphones may be used by the team.

(137) The visit will not interfere with activities of the formation or unit.

(138) The participating States will ensure that troops, other armed personnel and officials in the formation or unit are adequately informed regarding the presence, status and functions of members of teams and, if applicable, auxiliary personnel. Participating States will also ensure that no action is taken by their representatives which could endanger the members of teams and, if applicable, auxiliary personnel. In carrying out their duties, members of teams and, if applicable, auxiliary personnel will take into account safety concerns expressed by representatives of the receiving State.

(139) The travel expenses to and from the point(s) of entry will be borne by the visiting State.

(140) The visiting State will prepare a report of its visit which will be communicated to all participating States expeditiously.

(141) Each participating State will be entitled to obtain timely clarification from any other participating State concerning the application of agreed confidence- and security-building measures. Communications in this context will, if appropriate, be transmitted to all other participating States.

(142) The communications concerning compliance and verification will be transmitted preferably through the CSBM communications network.

IX. COMMUNICATIONS

(143) The participating States will establish a network of direct communications between their capitals for the transmission of messages relating to agreed measures. The network will complement the existing use of diplomatic channels. Participating States undertake to use the network flexibly, efficiently and in a cost-effective way.

(144) Each participating State will designate a point of contact capable of transmitting and receiving such messages from other participating States on a 24-hour-a-day basis. Each participating State will notify this designation in writing to other participating States not later than 15 April 1991 and will notify in advance any change in this designation.

(145) The technical characteristics of the network are set out in Annex II.

(146) Communications may be in any one of the six working languages of the CSCE.

(147) Details on the use of these six languages are set out in Annex III. The provisions of this annex have been elaborated for the practical purposes of the communication system only. They are not intended to change the existing use of all six working languages of the CSCE according to established rules and practice as set out in the Final Recommendations of the Helsinki Consultations.

(148) Messages will be considered official communications of the sending State. If the content of a message is not related to an agreed measure, the receiving State has the right to reject it by so informing the other participating States.

(149) Participating States may agree among themselves to use the network for other purposes.

(150) All aspects of the implementation of the network may be discussed at the annual implementation assessment meeting.

X. ANNUAL IMPLEMENTATION ASSESSMENT MEETING

(151) The participating States will hold each year a meeting to discuss the present and future implementation of agreed CSBMs. Discussion may extend to:

(151.1) — clarification of questions arising from such implementation;

(151.2) — operation of agreed measures;

(151.3) — implications of all information originating from the implementation of any agreed measures for the process of confidence and security building in the framework of the CSCE.

(152) Before the conclusion of each year's meeting the participating States will normally agree upon the agenda and dates for the subsequent year's meeting. Lack of agreement will not constitute sufficient reason to extend a meeting, unless otherwise agreed. Agenda and dates may, if necessary, be agreed between meetings.

(153) The Conflict Prevention Centre will serve as the forum for such meetings.

(154) The first annual implementation assessment meeting will be held in 1991.

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(155) The participating States stress that this new set of mutually complementary confidence- and security-building measures builds upon and expands the results already achieved at the Stockholm Conference and is designed to reduce the risk of military confrontation in Europe and emphasize that its implementation will contribute to these objectives.

(156) Reaffirming the relevant objectives of the Final Act, the participating States are determined to continue building confidence, to lessen military confrontation and to enhance security for all.

(157) The measures adopted in this document are politically binding and will come into force on 1 January 1991.

(158) The Government of Austria is requested to transmit the present document to the Meeting of the Heads of State or Government of the CSCE participating States in Paris and to the Helsinki Follow-up Meeting of the CSCE. The Government of Austria is also requested to transmit the present document to the Secretary-General of the United Nations and to the Governments of the non-participating Mediterranean States.

(159) The text of this document will be published in each participating State, which will disseminate it and make it known as widely as possible.

(160) The representatives of the participating States express their profound gratitude to the Government and people of Austria for the excellent arrangements they are making for the Vienna CSBM Negotiations and the warm hospitality they are extending to the delegations which are participating in the Negotiations.

Vienna, 17 November 1990

Under the terms of the Madrid mandate, the zone of application for CSBMs is defined as follows:

"On the basis of equality of rights, balance and reciprocity, equal respect for the security interests of all CSCE participating States, and of their respective obligations concerning confidence- and security-building measures and disarmament in Europe, these confidence- and security-building measures will cover the whole of Europe as well as the adjoining sea area* and air space. They will be of military significance and politically binding and will be provided with adequate forms of verification which correspond to their content.

As far as the adjoining sea area* and air space is concerned, the measures will be applicable to the military activities of all the participating States taking place there whenever these activities affect security in Europe as well as constitute a part of activities taking place within the whole of Europe as referred to above, which they will agree to notify. Necessary specifications will be made through the negotiations on the confidence- and security-building measures at the Conference.

Nothing in the definition of the zone given above will diminish obligations already undertaken under the Final Act. The confidence- and security-building measures to be agreed upon at the Conference will also be applicable in all areas covered by any of the provisions in the Final Act relating to confidence-building measures and certain aspects of security and disarmament.

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* In this context, the notion of adjoining sea area is understood to refer also to ocean areas adjoining Europe."

Wherever the term "the zone of application for CSBMs" is used in this document, the above definition will apply.

Technical characteristics of the communications network

1. The communications network will be based on a Packet Switched Data Network (PSDN) set up according to the X.25 protocol.

2. It will use public PSDN services wherever possible.

3. The message handling switch will be centralized in one location.

4. The message transfer system will need only a capacity to store and forward in order to perform its traffic management role.

5. The communications software could be based on the X.400 recommendations.

6. The minimum hardware requirement for the end point systems in the capitals will be PC-compatible.

7. Address codes will be used in order to ensure the privacy of the communications.

8. No encryption is required.

9. The integrity of messages should be protected.

Use of the six CSCE working languages

Messages will, wherever possible, be transmitted in formats with headings in all six CSCE working languages.

Such formats will be elaborated and agreed among the participating States with a view to making transmitted messages immediately understandable by reducing the language element to a minimum. The participating States agree to co-operate in this respect. This would include repeating entries in the agreed formats in Latin letters.

Any narrative text, to the extent it is required in such formats, and messages that do not lend themselves to formatting will be transmitted in the CSCE working language chosen by the transmitting State.

Each participating State has the right to ask for clarification of messages in cases of doubt.

Chairman's Statement

The participating States, in order to facilitate an efficient use of the communications network, will give due consideration to practical needs of rapid transmission of their messages and of immediate understandability. A translation into another CSCE working language will be added where needed to meet that principle. The participating States have indicated at least two CSCE working languages in which they would prefer to receive the translation.

These provisions do not prejudice in any way the future continued use of all six working languages of the CSCE according to established rules and practice as set out in the Final Recommendations of the Helsinki Consultations.

This statement will be an annex to the Vienna Document 1990 and will be published with it.

Vienna, 17 November 1990

ANNEX V

Chairman's Statement

Bearing in mind that the Madrid mandate states that the CSBMs will be provided with adequate forms of verification it is understood that in the continuing negotiations an adequate solution will be found to evaluate non-active formations and units which are activated for routine training purposes.

This statement will be an annex to the Vienna Document 1990 and will be published with it.

Vienna, 17 November 1990

ANNEX VI

Chairman's Statement

It is understood that the question of costs during evaluation visits will be addressed in the course of further negotiations.

This statement will be an annex to the Vienna Document 1990 and will be published with it.

Vienna, 17 November 1990

Chairman's Statement

It is understood that, taking into account the agreed date of entry into force of the agreed confidence- and security-building measures and the provisions contained in them concerning constraining provisions, the annual exchange of military information and its evaluation, and expressing their interest in an early transition to the full implementation of the provisions of this document, the participating States agree to the following:

Communications, in accordance with agreed provisions, concerning military activities involving more than 40,000 troops planned for the calendar year 1992 will be exchanged by 15 December 1990.

The information on military forces will be exchanged not later than 15 April 1991 and valid as of 1 May 1991. The information on plans for the deployment of major weapon and equipment systems will be exchanged not later than 15 April 1991.

The provisions on evaluation will be effective as of 1 July 1991. Therefore, for 1991 no participating State will be obliged to receive more than half the number of the evaluation visits it would otherwise according to this document be obliged to receive.

This statement will be an annex to the Vienna Document 1990 and will be published with it.

Vienna, 17 November 1990

CONFERENCE ON DISARMAMENT

CD/1071
4 March 1991

Original: ENGLISH

LETTER DATED 4 MARCH 1991 FROM THE PERMANENT REPRESENTATIVE OF HUNGARY ADDRESSED TO THE SECRETARY-GENERAL OF THE CONFERENCE ON DISARMAMENT TRANSMITTING THE TEXT OF THE STATEMENT ADOPTED AT THE SPECIAL MEETING OF THE POLITICAL CONSULTATIVE COMMITTEE OF THE WARSAW TREATY, HELD IN BUDAPEST ON 25 FEBRUARY 1991

I have the honour to transmit to you herewith the text of the Statement adopted at the Special Meeting of the Political Consultative Committee of the Warsaw Treaty, held in Budapest on 25 February 1991.

I would be grateful if you could circulate this letter and the attached statement as an official document of the Conference on Disarmament.

(Tibor Tóth)
Ambassador

GE.91-60429/9424A

STATEMENT OF THE MEMBER STATES OF THE WARSAW TREATY

The countries of Europe are liberating themselves from the legacy of the past, of the era of confrontation and division of the continent. The Charter of Paris has opened an era of democracy, peace and unity in Europe. The participating States of the all-European process build friendly relations, in respect of the Ten Principles of the Helsinki Final Act and on the basis of their common commitment to democracy, the rule of law and human rights.

The 22 States, signatories of the Treaty on Conventional Armed Forces in Europe, have stated in their Joint Declaration that they no longer consider each other as adversaries and will build new relations of partnership and co-operation. It was confirmed that every State has the right to belong or not to belong to a treaty of alliance. The end of the division of Europe provides an historical opportunity to give a new quality to relations in the field of security, while fully respecting the freedom of choice of States.

Bearing in mind the fundamental changes in Europe, and implementing the decision of the PCC's session in Moscow on 7 June 1990, the member States of the Warsaw Treaty have decided, acting as sovereign and equal States, to dismantle the military organs and structures of the Treaty by 31 March 1991.

The participants of the session stated that the decision is destined to contribute to the further reduction of military potentials in Europe and to the transition from security structures based on blocs to all-European structures in the spirit of the CSCE Paris Summit accords. They expressed their resolve to ensure, through joint efforts, dynamic progress towards the objectives set at the Paris meeting.

In the new situation, the States represented at the session will actively shift the development of their relations onto a bilateral basis. This will correspond to their mutual interest in constructive and friendly relations, as well as to the new European realities.

The participants of the session stressed that the full implementation of the Treaty on Conventional Armed Forces in Europe and the Vienna document on confidence-building measures, constitutes an important pre-condition for strengthening stability and security on the continent and for the further development of the Helsinki process.

CONFERENCE ON DISARMAMENT

CD/1072
12 March 1991

Original: ENGLISH

LETTER DATED 1 FEBRUARY 1991 FROM THE DEPUTY PERMANENT REPRESENTATIVE OF CANADA ADDRESSED TO THE SECRETARY-GENERAL OF THE CONFERENCE ON DISARMAMENT TRANSMITTING COMPENDIA ON CHEMICAL WEAPONS COMPRISING PLENARY STATEMENTS AND WORKING PAPERS FROM THE 1990 SESSION OF THE CONFERENCE ON DISARMAMENT 1/

In his statement of 31 January 1991, before the Conference on Disarmament, Ambassador Shannon noted that the Canadian Delegation would be making available to delegations the latest in the Canadian series of compendia of the plenary statements (PVs) (in one volume) and the Plenary Working Papers (WPs) (in two volumes) concerning chemical weapons delivered during the 1990 session of the Conference. I have the honour to inform you that these compendia are now available for distribution to the members of the Conference, and I should be grateful if the necessary arrangements could be made to proceed with this distribution.

In due course we will also be sending to you for distribution the compilation of working papers from the Ad Hoc Committee on Chemical Weapons (CD/CW/WP) (one volume).

(Signed) A.W.J. Robertson,
Minister and Deputy Permanent
Representative to the
Conference on Disarmament

1/ A limited distribution of these compendia in English only has been made to the members of the Conference on Disarmament. Additional copies are available from the Permanent Mission of Canada at Geneva.

CONFERENCE ON DISARMAMENT

CD/1073
12 March 1991

Original: ENGLISH

LETTER DATED 8 MARCH 1991 FROM THE PERMANENT REPRESENTATIVE OF CANADA ADDRESSED TO THE SECRETARY-GENERAL OF THE CONFERENCE ON DISARMAMENT TRANSMITTING COMPENDIA ON OUTER SPACE COMPRISING PLENARY STATEMENTS AND WORKING PAPERS FROM THE 1990 SESSION OF THE CONFERENCE ON DISARMAMENT */

In a brief plenary statement on 14 March to the Conference on Disarmament, we will announce that we are once again making available the next in our series of compendia on outer space, comprising plenary statements and working papers from the 1990 session of the Conference. As you know, similar documents have been distributed every year since 1985 and, with recent additions, these compendia bring together documentation covering the period 1962-1990.

I should be grateful if the necessary arrangements could be made for the distribution of the compendia to the members of the Conference on Disarmament.

Yours sincerely,

(Signed) Gerald E. Shannon
Ambassador and
Permanent Representative

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*/ A limited distribution of this compendia in English only has been made to the members of the Conference on Disarmament. A few additional copies are available from the Permanent Mission of Canada at Geneva.

CONFERENCE ON DISARMAMENT

CD/1074
CD/CW/WP.336
20 March 1991

Original: ENGLISH

UNITED STATES OF AMERICA

A report on the destruction of
3-Quinuclidinyl benzilate (BZ)

1. Introduction

In June 1986, the United States presented to the Conference on Disarmament a document outlining the United States Chemical Stockpile Disposal Program (CD/711). That document described the United States intent to dispose of its agent BZ stocks at Pine Bluff Arsenal, Arkansas. In June 1990, the United States completed the destruction of BZ and BZ-related materials, ending a 13-year project that cost $US 162.9 million. The following describes the BZ destruction program.

2. General overview

Agent BZ (3-quinuclidinyl benzilate) is an odourless, white crystalline solid which, when ingested, disturbs the functions of memory, comprehension, deduction and attention. The Army purchased 100,000 pounds of BZ in the early 1960s and produced two air deliverable weapons at Pine Bluff Arsenal (PBA): the M43 Cluster Bomb and the M44 Generator Cluster. The BZ was blended into a smoke mix and loaded into small canisters which were clustered into the weapons.

In August 1976, the United States Army Toxic and Hazardous Materials Agency (now the Office of the Program Manager for Chemical Demilitarization) was directed to develop a program for the destruction of the approximately 1,500 BZ munitions and about 10,000 pounds of pure BZ left over from the manufacturing operations. In addition, about 637 tons of contaminated residue from the manufacturing operations, cleanup of a storage igloo fire, and the testing operations associated with the initial process development, were to be destroyed.

A four phase program for the demilitarization of the BZ inventory was initiated in August 1977. The first phase consisted of laboratory development and verification of a viable destruction process. This phase was concluded in June 1981 with the selection of the incineration process. Phase two involved the design of the equipment and facilities required for the support of the selected process. It was completed in June 1982. Phase three consisted of the construction of the plant, acquisition and installation of the plant equipment, as well as systemization of the plant process. Plant systemization was completed by March of 1988. In May of 1988, phase four, plant operations, began. By September of 1989 all of the BZ munitions and agent in the PBA inventory had been destroyed. All remaining BZ contaminated residue at PBA was detoxified/incinerated by January of 1990. Plant cleanup and closure was completed in June of 1990. A timeline at Figure 1 chronicles the major milestones of the BZ demilitarization.

3. Inventory description

The BZ inventory items that were demilitarized, decontaminated and/or destroyed at the BZ facility are shown in Table 1, "BZ Munition & Items Inventory". The major items include M43 Cluster Bombs, M44 Generator Clusters, neat BZ, and drums containing solids and liquids. The dimensions and configurations of each BZ munition, and related containers are shown in Figures 2 through 4. Descriptions of each of the munitions and items that were stored at PBA follow:

(a) The M43 Cluster Bomb contained 57 M138 bomblets, which were arranged in three stacks of 19 each, separated by fibreboard spacers. Each bomblet was a thin walled steel cylinder containing four canisters and equipped on one end with an impact fuse. Each canister was filled with a 50/50 agent-pyrotechnic mixture. After separation from the cluser, the bomblet would immediately arm. Upon impact the fuse actuated and after an 8 to 12 second delay the pyromix ignited. Each cluster bomb was packed in a shipping guard constructed of eight wood stringers and two wooden end pieces secured by 1-1/4" steel strapping. Two clusters were overpacked in a plywood box as a security cover.

(b) The M44 Generator Cluster consisted of three BZ smoke generators stacked end-to-end in the cluster. Each smoke generator contained three tiers of 14 canisters and was equipped with a parachute assembly and a time delay

fuse. Each M44 was packaged individually in a plywood box measuring 56-3/4" long by 17-1/8" wide by 18-1/2" high, equipped with a fibreboard cover. The box was anchored to three skids.

(c) The neat, or bulk, BZ inventory was packed in 16-gallon steel drums. Each drum was lined with a polyethylene bag and contained 15 to 70 pounds of BZ (average weight of 45 pounds). Each 16-gallon steel drum was overpacked in a 30-gallon polyethylene bag and sealed inside a 30-gallon steel drum.

(d) Most solid and liquid residues were contained in 55-gallon steel drums. Solid residues consisted of contaminated scrap metal, clothing, tools, metal parts, refrigerator equipment, wood crating materials, downloaded canisters and miscellaneous solid materials. The liquid residue consisted of contaminated ion-exchange resin, liquid from sumps, and liquid decontamination residue. A significant number of the drums containing liquid residue had developed leaks over the years, and these "leakers" were placed in commercial 85-gallon overpack drums.

(e) There were six open top bins, approximately 24 cm long by 84 cm wide by 94 cm high, containing cut-up metal parts, tools, PVC pipe, and other miscellaneous items from the cleanup of the BZ pilot plant.

(f) In addition to the original Pine Bluff inventory, 42 BLU-50/B23 bombs were also processed at the BZ facility. These bombs were small, 40 gram munitions with a BZ/pyromix cast in a resin inside a canister the size of a D-cell battery. These were experimental munitions that were never placed into production.

In all, this inventory represents approximately 721 tons of material that was thermally detoxified at the BZ facility. The munition inventory included approximately 157,000 submunitions and 95,000 pounds of BZ agent. This total does not include the plant generated wastes which were processed concurrently during operations.

4. Method selection

(a) Two alternative methods of destruction of the BZ munitions were identified and examined early in the BZ disposal program: chemical neutralization and incineration.

(b) The first method considered was sodium hydroxide-based neutralization. A study completed in July 1980 concluded that BZ could be destroyed by base hydrolysis and that operating parameters and destruction

rate data were sufficiently quantified to permit, with reasonable confidence, the preliminary design of a full-scale chemical destruction process. However, the following inherent drawbacks were identified in the neutralization process that would affect its application in a full-scale facility:

(1) The destruction efficiency of BZ is limited in the neutralization process, particularly at high initial BZ concentrations.

(2) The presence of high concentrations of organic compounds and salts in the residual liquid present a potential disposal problem.

(3) The solution generated during the process is unstable and tends to increase in viscosity with time.

(c) These problems necessitate that the aqueous mixture generated by the neutralization process be incinerated to ensure destruction of the BZ and effective disposal of the organic chemicals. This two-step destruction process was not regarded as cost-effective, particularly when initial laboratory results had already indicated that the BZ and BZ/pyromix could be destroyed by one step incineration.

(d) Subsequent testing of the incineration process for the destruction of BZ indicated the following results:

(1) Bench scale incineration of neat BZ, BZ/pyromix, or BZ-contaminated material at 1,000° C for two seconds in excess air achieved destruction efficiencies at or greater than the target level of 99.994 per cent destruction.

(2) Decontamination at 1,000° C for 30 minutes of BZ-contaminated metal, glass, chars and residues in bench scale units reduced the BZ content below detection limits.

(3) Pyrolysis of BZ or BZ/pyromix at 500° C for two seconds achieved destruction near the target level, although extensive formation of tar-like products occurred.

(e) Thus, the direct one-step incineration process was chosen over the chemical neutralization method for application to the full-scale facility.

5. Environmental concerns

In the process of selecting a method for the destruction of the BZ inventory, the Office of the United States Army Program Manager for Chemical Demilitarization prepared documentation of potential environmental impacts that could occur during the construction and operation of a demilitarization facility. This documentation is required by the Natural Environmental Policy Act, as well as other Federal, State and local regulating

and permitting agencies. The primary environmental document was the Environmental Assessment prepared in August of 1983. The environmental assessment discussed the construction and operation aspects of a proposed facility and evaluated the associated environmental impacts. Several environmental considerations are identified and examined. The following list outlines the major topics:

(a) Alternatives considered:
    (1) Process alternatives
    (2) Location alternatives

(b) Description of the affected environment:
    (1) Air quality and climatology
    (2) Water resources and water quality
    (3) Geological resources
    (4) Land use
    (5) Socio-economic resources
    (6) Existing acoustic environment
    (7) Transportation
    (8) Cultural/historical/archaeological resources
    (9) Ecological resources
    (10) Threatened and endangered species

(c) Environmental impacts of the proposed action:
    (1) Air quality
    (2) Water quality
    (3) Soil and hazardous waste disposal impacts
    (4) Geologic hazards
    (5) Land use impacts
    (6) Transportation
    (7) Socio-economic
    (8) Health impacts
    (9) Noise impacts
    (10) Cultural/historical/archaeological resources impacts
    (11) Ecological resources impacts
    (12) Threatened and endangered species impacts

The conclusion of the evaluation was that the proposed action was not expected to significantly affect the quality of the human environment, did not set a precedent for other United States Army actions, and therefore, did not necessitate the preparation of an Environmental Impact Statement.

6. Process selection/description

(a) Once incineration was selected for destruction of the BZ and BZ-related materials, the next step was to define a process by which we could implement the incineration method in full-scale plant operations. After considering several options, a process was accepted that consisted of unpacking and rendering inert (by water soaking under pressure) the munitions, disassembling the munitions to their component parts (submunitions) and destroying the agent-containing submunitions in a rotary Deactivation Furnace System (DFS). Metal parts, wood dunnage and contaminated residues would be processed through a metal parts furnaces. The discharged material from the metals parts furnaces would be land-filled at an approved site. A liquids incinerator would be used to destroy the neat BZ, which was dissolved in acetic acid. Agent contaminated liquids, wash down liquids and toxic area shower waters were also to be destroyed in the liquids incinerator.

(b) After the process was determined and the site selected, the facility design and construction was initiated. The resulting BZ facility at Pine Bluff covers nearly 10 acres and consists of several structures.

(c) The main processing area of the BZ facility is the Munitions Demilitarization Building (MDB). The MDB houses the materials handling, munitions disassembly and thermal processing equipment used to demilitarize the BZ inventory.

(1) The toxic change area within the MDB contains storage for various levels of protective clothing and equipment, change areas, personnel showers, suit removal areas, monitoring stations and decontamination showers.

(2) The Munitions Inerting Room (MIN) contained four free-standing steel inerting vessels and support equipment where munitions were inerted by soaking them in water under pressure. Evacuating the air from the munition and injecting water to ensure contact with the pyrotechnic mixture enabled safe handling of the munitions.

(3) A rotary DFS contained within a heat protective shroud in a steel reinforced concrete room was a key element of the BZ facility. Together, the furnaces of the DFS burned out and decontaminated the

submunitions from the BZ munitions. Scrap discharged from the DFS entered a heated discharge conveyor (HDC) which was located adjacent to the furnace room.

(4) The Metal Parts Furnace (MPF) System consisted of a total of four natural gas fired furnaces in a sealed, ventilated room. The MPFs were used to thermally decontaminate an assortment of inventory and plant-generated waste items. Two of the four MPFs had primary fume burners attached to their exhaust stacks to enable them to process certain Resource Conservation and Recovery Act (RCRA) hazardous waste.

(5) The liquid incinerator and several liquid collection holding tanks were housed in the liquid incinerator room (LIC). All plant liquid process waste from inerting the munitions, daily and weekly wash downs, and the acetic acid solution containing the neat BZ, were pumped to and destroyed in the LIC.

(6) A chemical distribution system was the central location for storage, preparation and distribution of acetic acid and decontamination solutions used throughout the BZ facility.

(7) The exhaust from each of the furnace systems was ducted to a common afterburner. The final effluent was processed through a bag house to catch any residual particulate and the clean gases were then monitored and exhausted through a 40 metre stack. An agent alarm during operations would cause feed to the furnaces to be suspended if agent was detected.

(8) Air monitors were placed in several locations in the MDB during operations to monitor the BZ levels and the levels of several compounds specified by the industrial hygiene regulations. In addition, several swab samples were taken each day to assure the absence of surface contaminants. If any of the monitors or samples exceeded specified levels, the area would be evacuated and the operations suspended until appropriate action could be taken.

7. Operations

(a) Toxic operations began at the BZ facility at Pine Bluff in May 1988. The original operations concept, based on safety considerations, directed that the neat BZ should be processed first, followed by the M43 munitions, the M44 munitions, any disassembled munitions and submunitions, and finally the solid and liquid waste inventory. In addition to the inventoried BZ items, it was recognized that the liquid and solid wastes generated during the demilitarization/disposal activities would also have to be processed by

the plant during operations. Toxic operations were conducted for slightly over 21 months. Destruction of all the BZ and BZ-related materials was completed as follows: 242 drums of neat BZ, September 1988; 519 M43 Cluster Bombs, December 1988; 973 M44 Generator Clusters, June 1989; 78 disassembled M43s and M44s, September 1989; and 2,667 drums of both solid and liquid contaminated waste and scrap resulting from earlier production, storage and testing of BZ, January 1990.

(b) In addition to the inventoried BZ items, the plant was also required to process 5,964 drums containing approximately 90 pounds each of plant-generated waste. This waste was comprised of lab waste, wood from the shipping containers and pallets, decontamination solutions, contaminated clothing, rinse water, miscellaneous metal waste and the munitions casings. This waste was processed concurrently with the inventoried BZ material.

(c) In support of the plant, the laboratory was required to analyse between 40 to 120 samples per day. Laboratory personnel were also required to maintain the laboratory equipment and the plant and stack monitors to within the operating and quality control specifications. Each day plant operations were not allowed to begin until the laboratory could demonstrate that two separate analytical detection methods were in control and operable in the lab.

(d) Over 200 people were required to operate the BZ facility over the duration of the toxic campaigns. The plant personnel were required to complete an intensive training and testing program. The program consisted of a seven-step series of classroom, practical and operational training. The first five steps in the series qualified operators to operate the plant during non-toxic procedures. The final two steps certified operators to operate the plant during toxic operations.

(e) A large quantity of thermally decontaminated material resulted from the disposal of the BZ inventory. Demilitarization of the M43 and M44 munitions resulted in decontaminated metal parts, wood ash, and submunition bodies. Because the Army classified the munitions as Class B explosives, the BZ-filled munitions were classified as hazardous materials under the RCRA. The facility therefore was classified as a hazardous waste incinerator and was issued permits as such.

(f) The Army conducted a toxicity test of the char produced during BZ munition test burns at PBA. The results indicated that the material tested did not exhibit toxicity characteristic of hazardous waste and was free of any detectable BZ. In addition Caustic Methyl Cellosolve (CMC), the main

hazardous constituent in the BZ inventory of liquid drums, was also incinerated at PBA. The waste residue from this incineration was subjected to RCRA solid waste tests by the United States Army Environmental Hygiene Agency (USAEHA). This char also did not exhibit any RCRA hazardous conditions. Despite these findings, all the operational furnace residues and approximately 500 pounds of particulate and bagged particular material from the bag house were sent to the PBA RCRA hazardous waste landfill during the operation of the BZ facility.

8. Plant clean-up/demobilization

(a) The BZ facility at Pine Bluff was originally planned to be converted and used as part of the Chemical Stockpile Disposal Program (CSDP) plant to be built to demilitarize the unitary chemical stockpile at Pine Bluff upon completion of the demilitarization of the BZ inventory. Instead the final BZ facility closure implementation plan was predicated upon the dismantling, deactivating and in-place decommissioning of structures, waste management units, systems components and ancillary equipment to satisfy the RCRA permit. Thermal treatment (incineration) of selected items was employed in order to limit potential residual BZ contamination, to reduce landfill waste disposal volumes and to minimize the post-closure maintenance expenses and inventory.

(b) The intent of the closure activities and procedures was to remove only those equipment, components, structures and accessories from toxic areas that could not be decontaminated in place. Such items were removed and processed through the MPFs. The remaining equipment, components, structures and accessories located in toxic areas, were decontaminated in place to the level at which no surface contamination was present and certified clean by swab sampling. All wastes that were generated during the decontamination process were processed by established procedures. The status of the BZ demilitarization facility upon closure permits the United States Government to implement whatever planned future use, if any, it might envision within specified limits.

9. Overall program cost and chronology

The entire BZ inventory and all related material were demilitarized or disposed of, and the plant was decontaminated and decommissioned in June of 1990. The total program duration, from inception to conclusion, was 13 years and 11 months. The total cost for the program, excluding the cost of the

Office of the United States Army Program Manager for Chemical Demilitarization support, was $US 162.9 million. The BZ Program was broken down into eight major programmatic and cost elements. Each element is defined below:

(a) Process design/development

This element includes the costs from the program concept plan, laboratory development studies, process development studies and the equipment design charges. This element started with the BZ program conception in August of 1976 and ended when construction on the facility began in September of 1983. The cost for this element was $US 20.4 million.

(b) Construction

This element includes United States Army military construction funds to build the BZ facility. Construction began in August 1984 and ended in October 1986. The cost for this element was $US 8.8 million.

(c) Equipment acquisition/installation

This element covers the cost to purchase and install all the equipment in the BZ facility. Equipment installation began in July 1983 and was completed in January 1987. The cost for this element was $US 31.0 dollars.

(d) Systemization

This element encompasses all costs associated with the period between acceptance of the plant with functioning equipment, and the point at which toxic operations began. It includes testing of equipment to prove proper co-ordination operation, personnel training and testing, system interlock verification, monitoring equipment verification, laboratory certification, a short period of simulated operations, and a pre-operational survey with associated correctional costs. Systemization began in January of 1987 and was completed in March of 1988 at a cost of $US 26.6 million.

(e) Operations

This element includes all costs associated with the operation of the BZ demilitarization facility during toxic operations. Toxic operations began in May 1988 with the first shipment of bulk BZ and were concluded in January 1990 when the last item of BZ-related material in the BZ inventory was processed through the plant. This element cost $US 51.6 million to complete.

(f) Closure

This element covers the cost to decontaminate and demobilize the BZ facility after toxic operations. It includes the cost of removing and destroying any contaminated equipment and process waste, as well as the cost

to decontaminate and secure the facility. Closure operations began in January 1990 and were completed in June 1990 at a cost of $US 5.2 million.

(g) Depot support

A related additional cost to each of the above elements is the depot support cost. The depot support costs are the charges incurred for the PBA services rendered in support of the BZ program. These costs include personnel support for security safety, munitions transport, contract administration, utilities, and laundry services. The depot support costs began in 1980 and ran to the completion of the BZ program. The total depot support cost was $US 19.3 million.

FIGURE 1

BZ Demilitarization Program

Key Milestone Summary

Program assigned by Department of the Army (DA)	August 1976
Concept Plan approved by DA	August 1977
Laboratory (Phase I) support contract awarded to Battelle Columbus Laboratories	August 1978
Laboratory investigations of incineration and chemical neutralization completed	July 1979
Publication of exposure limits (Ideals)	January 1980
Laboratory investigations at PBA (incineration/ Detection Tests)	July 1980
Laboratory (Phase I) completed and process development (Phase II) begins	June 1981
Process development support contract awarded to Battelle Columbus Laboratories	September 1981
Munitions demonstrated to be non-detonatable	November 1981
FY84 construction design authority received	January 1982
Construction designer selected	June 1982
All major process development tests at PBA completed	June 1982
Construction concept design approved	February 1983
Process equipment acquisition contract awarded to Burns and Roe Industrial Service Corporation	July 1983
Construction and equipment designs completed	September 1983
Construction (Phase III) started	September 1983
Resourse Conservation and Recovery Act (RCRA) permit filed with State of Arkansas	September 1983
Air permit filed with State of Arkansas	December 1983

FIGURE 1 (continued)

Key Milestone Summary (Continued)

Safety site emissions approved	April 1984
Air permit issued by State of Arkansas	May 1984
RCRA permit issued by State of Arkansas	June 1984
Construction contract awarded to CWR, Inc.	August 1984
Equipment installation started	October 1985
Structural construction completed	October 1986
Equipment installation completed	January 1987
Systemization completed	March 1988
Preoperational survey completed	April 1988
Operations (Phase IV) started	May 1988
Destruction of neat BZ completed	September 1988
Destruction of M43 Cluster Bombs completed	December 1988
Destruction of M44 Generators completed	June 1989
Destruction of Disassembled M43 and M44 munitions completed	September 1989
Destruction of drummed solid material completed	September 1989
Destruction of drummed liquid material completed	January 1989
Plant clean-up and demobilization completed	June 1990

TABLE 1. BZ MUNITION & ITEM INVENTORY

MUNITIONS	Crated	QUANTITY Defused & Disassembled	Total
M43 Bomb Cluster	519	11(a)	530
M44 Generator Cluster	973	37(a)	1010
NEAT BZ	**30-Gal Drums**	**QUANTITY**	**Total**
16-gal pails of neat BZ overpacked in 30-gal drums	242		242
ITEMS	**55-Gal Drums**	**QUANTITY 85-Gal Drums**	**Total**
Solid Residues(b)			
Ion-exchange resin	0	27	27
Sand	25	0	25
Filters	18	3	21
Insulation	31	0	31
Metal Parts from Refrigeration Equipment	111	0	111
Metal Parts from Disassembled Munitions	54	0	54
Wood	612	0	612
Miscellaneous Waste Materials (clothing, pipe, tools, etc)	109	20	129
	960	50	1010
Liquid Residues(b)			
CMC-water mixtures(c)	571	456	1027
Hydraulic oil	0	3	3
	571	459	1030

Other Residues

- 2 pallets plus 5 boxes of filters
- 5 storage pigs, boxed
- 1 box of reamed BZ-pyromix (545g)
- 1 wooden bulkhead
- 4 boxes of BZ lab samples
- 4 decon bath containers
- 1 roll packing material
- 8 smoke pot cans
- 6 metal bins with metal parts, tools, PVC pipe, etc. from building clean up.

(a) 25 M44s were dissassembled during previous test programs. An additional 12 M44s were disassembled following an igloo fire.

(b) PBA estimates that the cleanup of the BZ test igloo will generate an additional 200 drums of miscellaneous solids and 250 drums of CMC liquids.

(c) CMC is a mixture of 80 percent methyl cellosolve (see Appendix G), 10 percent NaOH and 10 percent water. The concentrations of CMC in the drums (i.e., the degree of dilution with water) is not known.

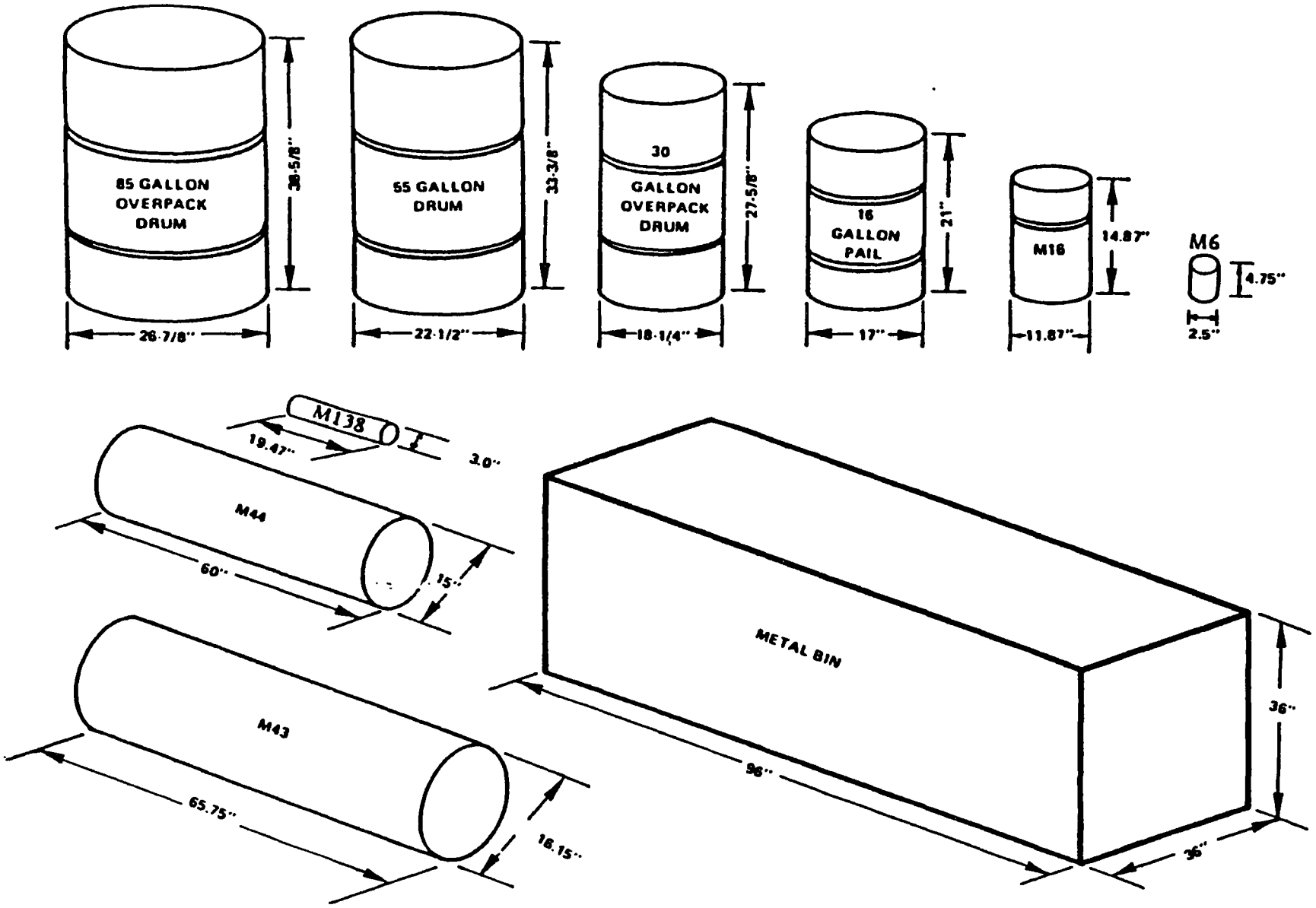
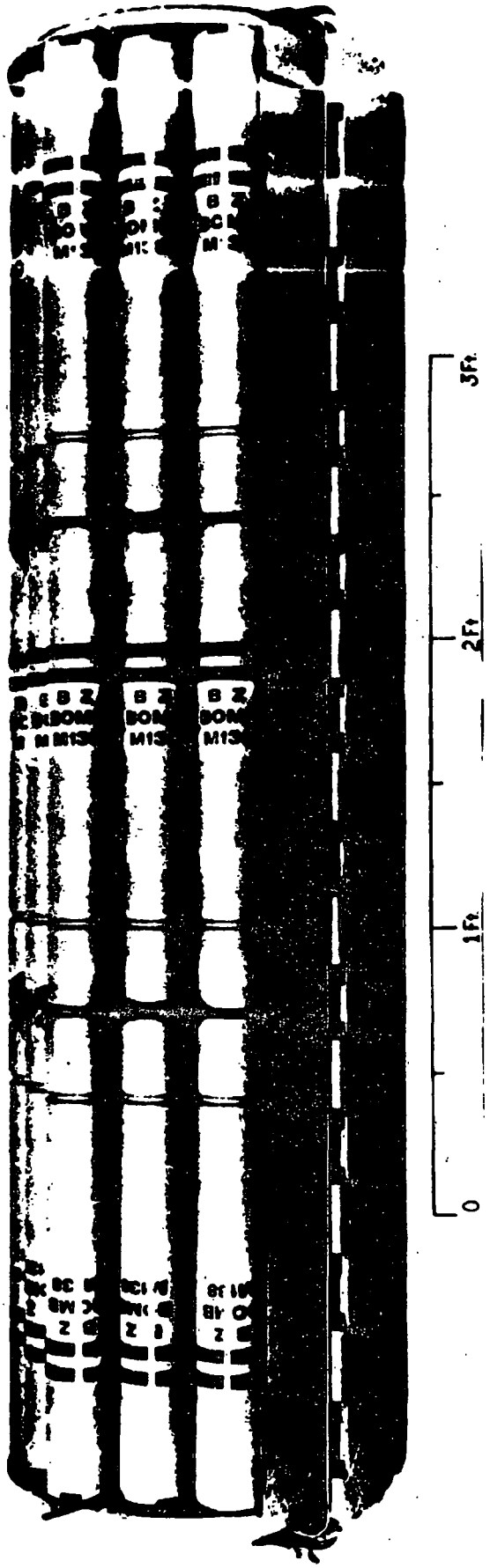


FIGURE 2 DIMENSIONS OF BZ-RELATED CONTAINERS



CLUSTER, BOMB, INCAPACITATING, BZ, 750-lb., M43

Figure 3

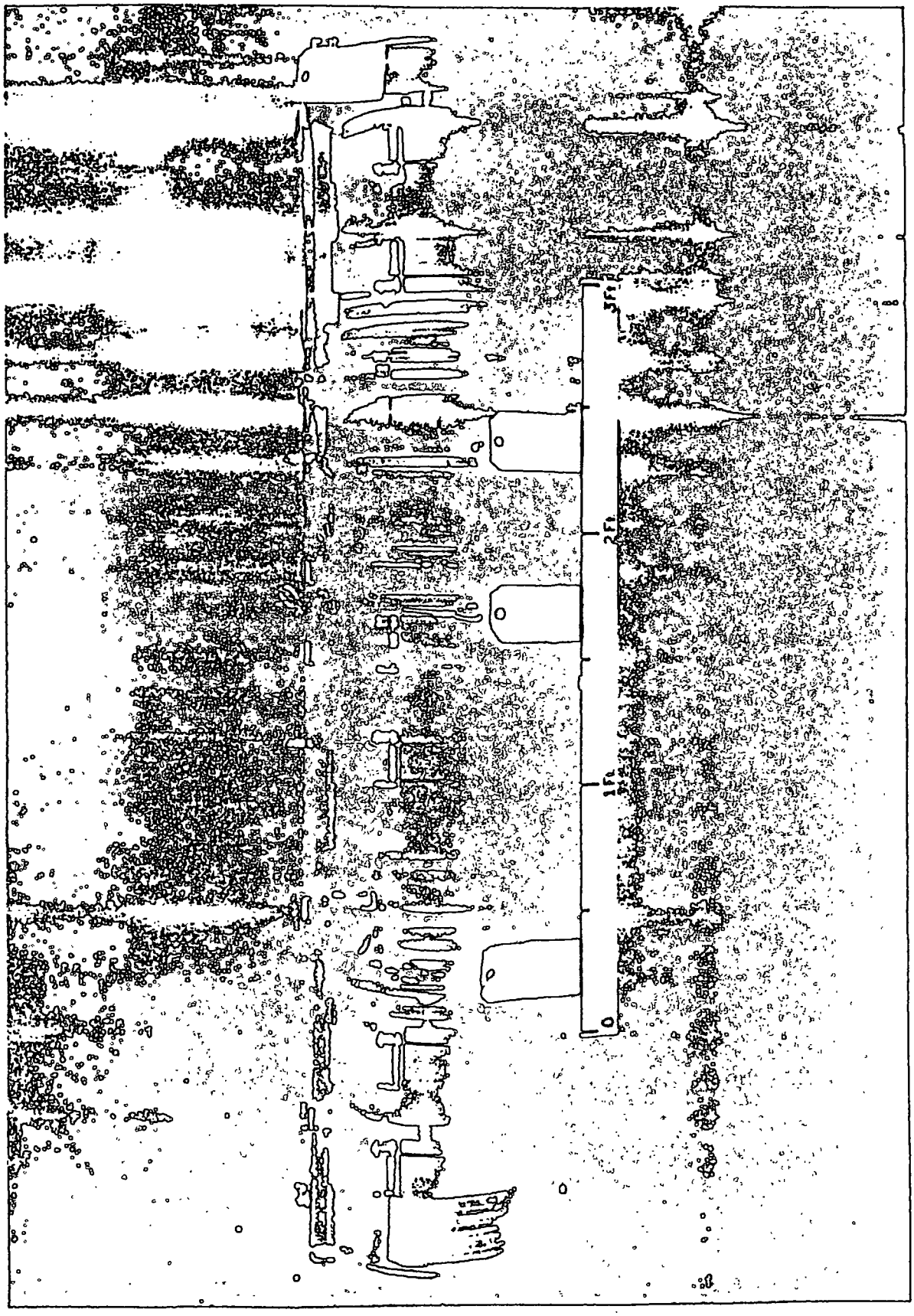


Figure 4

CONFERENCE ON DISARMAMENT

CD/1075
CD/CW/WP.337
14 May 1991

Original: ENGLISH

PERU

Working Paper on Challenge Inspections/Inspections on Request

I. Introduction

1. The verification system flowing from an arms limitation treaty encompasses a group of rules, methods, procedures and verification techniques aimed at guaranteeing that any Contracting Party comply with its obligations. In other terms: verification is a human activity for tangible purposes under given parameters, so that hidden intentions can never be detected.

2. As a human invention, verification is far from being 100 per cent accurate: absolute verification or a perfect verification system remain a utopian exercise. On the other hand, verification is not enough in itself to deter any Contracting Party from violating its obligations. A set of credible sanctions is needed to match the detection risk. Generally speaking, it seems easier to verify the complete elimination of something than its partial banning. However, the difficulties arise "au fur et à mesure" the ambiguities surrounding the main obligations or the complexities of the subject matter increase. In any event, the verification of the arms limitation treaties is a kind of confidence-building measure intended to allay the fears among the States involved and provide them with a reasonable degree of reciprocal security.

II. Objectives and Structure

3. The multilateral Covention on the complete and effective prohibition of chemical weapons and on their destruction aims at two main objectives: (i) chemical disarmament which implies, grosso modo, the elimination of all existing arsenals of chemical weapons as well as all chemical weapon production facilities of the States Parties; and (ii) peaceful uses of chemical industry, including the prevention of the development of chemical weapon capabilities.

4. To achieve these objectives the international verification system, as it appears in the "Rolling Text" (document CD/1046), currently under elaboration, has already a structure based on two main pillars: (i) the verification of compliance with the provisions pertaining to chemical disarmament (articles III, IV and V, in accordance with annexed texts); and (ii) the

verification of compliance with the provisions dealing with activities not prohibited under the Convention (article VI, paras. 1 and 2, in accordance also with annexed texts). In addition, both are strengthened by a complementary mechanism specially aimed at clarifying any doubt or concern about compliance with those obligations, the short-notice challenge inspection/inspection on request being its most outstanding component (article IX).

III. Challenge Inspections/Inspections on Request

5. This kind of inspection is one of the main features of the international verification system. Besides the fact already mentioned that absolute verification is beyond human possibilities, routine verification in all facilities relevant to the Convention implies an "unmanageable burden" on the Technical Secretariat with direct repercussion in its size and financing of the numerous verification activities.

6. Thus, the challenge inspection/inspection on request constitutes an indispensable device for complementing a set of reasonable and affordable verification measures related to articlves IV, V and VI. In this connection, challenge inspection/inspection on request, could be taken as a confidence-building measure or a "safety net" in order to safeguard confidence and prevent threats against the security of the States Parties to the Convention.

7. Bearing in mind the principle of non-discrimination as recognized by the 1988 session of the United Nations Disarmament Conference and endorsed by the United Nations General Assembly, the implementation of this complementary mechanism should not give place to any kind of discrimination between the requesting and the requested States Parties. On the other hand, every State Party should accept as a basic principle that all Contracting Parties intend to behave correctly and that they will comply faithfully with the provisions of the Convention. In this line of thought, the right of the requesting State must not override the right of the requested State. "Bonna fide" of the requesting and requested States Parties is of utmost importance so as to preclude abuse of this kind of inspection. Accordingly, the notion of suspicion should be excluded at the beginning.

8. Furthermore, the right to set-off a challenge inspection/inspection on request, is not unlimited or at least it should be restricted at the beginning precisely because its purpose is to demonstrate compliance with the obligations and not to prejudge suspected activities in the requested State. Additionally, the protection of confidential information also constitutes another barrier to free access any time to the declared facilities or areas for verification purposes. So, the notion that this kind of inspection is to be "conducted anywhere without delay" seems premature if it is mandatory from the very beginning and the obligatory presence of observers of the requesting State risks to question not only the reliability of the international verification system, but also the principle of non-discrimination among States involved.

9. One way to solve this problem, without placing in jeopardy the universal acceptance of obligatory challenge inspection/inspection on request, could be to conduct this kind of inspection in two stages. In the first one, technically oriented and strictly confidential, all the steps will remain

within the competence and powers of the Director-General. Upon receipt of a request coming from a State Party, he should inform, within the following 24 hours, the requested State as well as the Executive Council. Then, in the following 24 hours he should designate an inspection team which should immediately reach the territory of the requested State and have access to any facility or installation relevant to the request, but not yet "anywhere".

10. However, if the inspection team does not succeed in clarifying the existing doubts or concerns as they appear in the request, then the Executive Council should meet within the following 48 hours to consider the extension of the mandate to "anywhere" within the scope of the request in order to make a final assessment about the situation and whether or not the Convention is being violated. This second stage would be of a politial nature and utilized as a weapon of last resort in the field of inspections, before further action - including possible sanctions - is taken.

11. There is no doubt that a request has to be as precise as possible. Although access must never be refused as a matter of principle, there is no question in the first stage of conducting a challenge inspection/inspection on request beyond the parameters of the request itself (nature of the suspected non-compliance, the specific site to be inspected and matters on which reassurance is required). That is not the case for the second stage where further access without any restriction relevant to the request should be the main component, given its highly political implications.

12. The principles of non-discrimination and good faith among requesting and requested States Parties might also render it advisable to include in the Convention provisions to discourage any abuse of the right of States Parties to request challenge inspection/inspection on request. Sanctions could be envisaged in case a State Party reiterates requests which are groundless.

CONFERENCE ON DISARMAMENT

CD/1076
CD/CW/WP.338
21 May 1991

Original: ENGLISH

LETTER DATED 16 MAY 1991 FROM THE DEPUTY PERMANENT REPRESENTATIVE OF AUSTRIA TO THE SECRETARY-GENERAL OF THE CONFERENCE ON DISARMAMENT TRANSMITTING A STUDY ENTITLED "DETECTION OF INHIBITORS OF THE ENZYME ACETYLOCHOLINE ESTERASE OVER LONG DISTANCES USING OPTICAL FIBERS"

I have the honour to forward to you a copy of an Austrian study entitled "Detection of inhibitors of the enzyme acetylocholine esterase over long distances using optical fibers" and I would ask you to be kind enough to circulate it as an official document of the Ad Hoc Committee on Chemical Weapons as well as of the Conference on Disarmament.

(Signed) Christian Strohal
Deputy Permanent Representative
to the Conference on Disarmament

GE.91-60871

Project

Detection of inhibitors of the enzyme acetylcholine esterase over long distances using optical fibers

AUSTRIAN SCIENTIFIC COUNCIL FOR THE IMPLEMENTATION OF THE CHEMICAL WEAPONS CONVENTION

final report, April 1991

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Mag. Ernst Zinterl

Abstract

Many pesticides (such as organophosphates or carbamates) and most nerve agents used in chemical warfare (such as Tabun, Sarin or VX) are potent inhibitors of a group of enzymes present in humans and animals, called choline esterases. The activity of one of these esterases, the acetylcholine esterase (AChE), is essential for the function of the nerve system. An inhibition of the AChE in humans leads to sweating, headache and running nose in the case of a minor contamination. If the AChE is completely inhibited, cramps, paralyzation of the breath center and finally the death are the result.

Pesticides are commonly found in ground water and drinking water due to their extensive use in agriculture as crop protection agents. The production and the transport of these substances represents another area of possible contamination of humans and of the environment (i.e. Cordoba, Mexico, May 1991). As recent political developments have shown, the use of chemical weapons still threatens millions of people. The rapid and accurate detection of inhibitors of the acetylcholine esterase therefore represents an important preventive procedure for the protection of humans, animals and environment.

We have developed a new method for on-line detection of inhibitors of the AChE in a continuous flow system. The presence of inhibitors is detected optically through fibers. Therefore, the sensing part of the apparatus can be as far as 1000 meters and more away from the detecting part. The detection principle combines low detection limits (for example 10 nM of the potent reversible inhibitor BW 284 C51) with remote sensing, cheap and robust solid state technology (light emitting diodes as light sources and photodiodes as light detectors) and ease of operation. The detection limits for the presence of inhibitors of the AChE can be enhanced by one to two orders of magnitude. This can be achieved through an optimization of the electronical, chemical and optical components of the system without major increase of the costs of the system.

Otto S. Wolfbeis, Wolfgang Trettnak, Michael Hofer, Franz Reininger, Ernst Zinterl

THE DETECTION OF INHIBITORS OF THE ENZYME ACETYLCHOLINE ESTERASE OVER LONG DISTANCES USING OPTICAL FIBERS

1. The detection of inhibitors of the enzyme acetylcholine esterase: concern and pertinence [1-10]

Acetylcholine is the most important chemical transmitter in the nerve system of humans and animals (Fig.1). If a sense-organ is stimulated by an external event, the excitation is transformed into bioelectrical impulses which are transmitted through the nerve fibers to the central nerve system and/or the brain.The nerve fibers consist of many nerve cells which are connected to each other by a slit, called synapse. The electrical information is transmitted chemically across the synapse between two nerve cells. The transmitter substance in this chemical reaction is the acetylcholine. It is released at one side of the synapse through the excitation arising from the electrical impulse of one nerve cell. Acetylcholine then diffuses across the slit to the other side of the synapse and excites the next nerve cell. In fact, the transmission of the stimulation information of the sensing organ can be viewed as succeeding reaction of many electrical and chemical transmission steps.

Fig. 1

After excitation of the nerve cell, the acetylcholine molecule has to be destroyed in order not to excite continuously the nerve cell. This deactivation is performed by the enzyme acetylcholine esterase which hydrolyzes the acetylcholine into choline and acetic acid. An inhibition of the enzyme acetylcholine esterase results in an incomplete deactivation of the transmitter acetylcholine. The consequences in humans are sweating, headache and running nose in the case of a minor inhibition. If the acetylcholine esterase is completely inhibited, cramps, paralyzation of the breath center and finally the death are the result. The inhibition of the enzyme may be reversible or irreversible, depending on the desired area of application. Since many inhibitors of the acetylcholine esterase are commonly used in civil as well as military tasks, the importance of a detection method for these substances becomes obvious.

Several classes of substances are potent inhibitors of the enzyme acetylcholine esterase: Organophosphates, carbamates, quarternary ammonium ions and methanesulfonates. Organophosphorus inhibitors of the acetylcholine esterase have found application in two main areas: as pestizides in agriculture (i.e. E 605) and as chemical weapons (i.e. Sarin, Tabun). Chemical warfare agents and pesticides cannot be separated strictly since some organo-phosphorus compounds have served many years both purposes. The main difference between the pesticides and the chemical weapons is the choice of the substitutents at the phosphorus atom during syntheses. For example, fluoride has been used as a substituent in chemical weapons to enhance the speed of inhibition of acetylcholine esterase. Carbamates are used extensively in the crop protection. Quarternary ammonium ions and carbamates both have served in medicine as parasympathomimetic agents.

2. The determination of inhibitors of the enzyme acetylcholine esterase

The most widely-used methods for the determination of organophosphorus and carbamate pesticides are high-pressure liquid chromatographie (HPLC), gas chromatographie (GC) and mass spectroscopy (MS) [11]. All of these methods require a tedious sample pretreatment, sophisticated instrumentation and are expensive.

To detect inhibitors of the enzyme acetylcholine esterase (AChE) it is advantageous to use the enzyme itself. For this purpose the activity of the enzyme is measured in the presence of an inhibitor after an incubation time of typically 30 minutes. Many methods have been described which differ in the way in which the activity of the enzyme is determined [11,12].

The natural substrate of the enzyme is acetylcholine which is cleaved by acetylcholine esterase to give acetate and choline (Equ. 1). In a radiometric assay acetylcholine was labelled with tritium (H^3) or with carbon C^{14} at the acetyl group. After reaction with the enzyme, the acetic acid produced was separated and its radioactivity was measured [11,12]. The problems of this method are the radioactive labelling of the acetylcholine, the radioactive waste, which has to be dispose and the radioactivity itself.

$$\text{acetylcholine} + H_2O \xrightarrow{\text{AChE}} \text{acetate} + \text{choline} \qquad \text{(Equ. 1)}$$

In electrochemical methods the production of acetic acid (Equ. 1) was followed with a pH electrode [12] or with a pH sensitive field effect transistor (ISFET) [13]. Very often, the reaction of acetylcholine esterase is coupled to a second enzymatic reaction. The enzyme choline oxidase (ChOD, EC 1.1.3.17) oxidizes choline and as products betaine and hydrogen peroxide are formed (Equ. 2). The hydrogen peroxide can be detected amperometrically with a platinum electrode [14,15].

$$\text{choline} + 2\,O_2 + H_2O \xrightarrow{\text{ChOD}} \text{betaine} + H_2O_2 \qquad \text{(Equ. 2)}$$

In an other method, acetylthiocholine iodide has been used instead of acetylcholine and the formation of thiocholine was monitored potentiometrically [12].

Synthetic enzyme substrates are very often used in optical methods for the determination of inhibitors of acetylcholine esterase. The substrates and products usually show different colours and the colour changes occuring during the enzymatic reaction can be detected photometrically. A typical example is the yellow substrate indophenyl acetate, which is hydrolyzed by cholinesterases producing an intensely blue product [11].

Fluorescent dyes have also been used in detecting inhibitors of acetylcholine esterase. Indoxylacetate or resorufinacetate show a strong fluorescence after hydrolysis by the enzyme whereas the substrates do not show fluorescence. Unfortunately the excitation wavelengths of most of these compounds are in the ultraviolet region of the light [12].

Other colorimetric methods are based on complex reactions to produce a dye whose absorption is measured. The method from Ellman is well known [12]: Acetylthiocholine is hydrolyzed by acetylcholine esterase and the thiocholine formed reacts with 5,5′-dithiobis-(2-nitrobenzoate) to give a yellow dye.

Immunological reactions have also been used for the determination of pesticides. In an immunoassay for paraoxon, the high selectivity and sensitivity of an antigen/antibody reaction was coupled with the specificity of an enzymatic reaction [11]. Although this method was highly sensitive for paraoxon, it could be used for the detection of this single pesticide only. In addition it was very expensive and time consuming.

In this report we present a novel optical method for the determination of inhibitors of acetyl- and butyrylcholine esterases. We use synthetic enzyme substrates which are yellow in aqueous solution and are converted into blue products by choline esterases. In

absence of an inhibitor, all substrate is hydrolyzed by the enzyme to give the blue product. In presence of an enzyme inhibitor the amount of blue dye formed is reduced. This causes a change in colour, which may serve as an alarm for the presence of enzyme inhibitors for example in a drinking water reservoir. As the enzyme substrate is the indicator itself, no additional chemical reactions (and therefore no additional reagents) are required. The enzymes are immobilized covalently on glass or polymer particles and can be used over several days continuously in an enzyme reactor.

The blue colour of the products allows the detection with the help of a yellow light emitting diode (LED) as the light source. Cheep LED's with high light out-put are available for longer wavelengths of the visible spectrum only. The use of optical fibers makes tit possible to perform measurements over large distances and at inaccessible places. Additionally, in this work we use a complete new type of a photometer, which is equipped with inexpensive components like LED's as light sources, photodiodes as detectors and plastic fibers. With this instrument, a simple and cheap instrumentation is possible, in contrast to the expensive commercial photometers.

If lasers are used as light sources in connection with optical glass fibers, measurements can be performed over distances of at least several hundred meters. The procedure was designed as an on-line method for continuous measurement. As all substances which inhibit the enzymes acetylcholine esterase and butyrylcholine esterase can be detected, a kind of a sum of parameters is measured. We assumed that it is of interest to detect any substance which is harmful to the human nerve system and therefore to the whole organism. We were not looking for a method allowing the identification or quantification of pesticides or nerve gases in drinking or ground water. Of course the method shows different sensitivities towards the various inhibitors due to the different inhibiting properties of the substances.

3. Experimental

3.1. Materials

The enzymes acetylcholine esterase (EC 3.1.1.7; type VI-s, from electric eel) with a specific activity of 200 U/mg and butyrylcholine esterase (EC 3.1.1.8; from horse serum) with a specific activities of 360 or 308 U/mg were obtained from Sigma Chemie GmbH (Deisenhofen, FRG).

The synthetic enzyme substrates were Substrate A (with an acetoxy group) and Substrate B (with a butyroxy group). These compounds are proprietary substances.

The enzyme inhibitors paraoxon (diethyl-p-nitrophenylphosphate, E 600; 95 % liquid), pyridostigmine bromide and 1,5-bis(allyldimethyl-ammoniumphenyl)-pentane-3-one dibromide (BW 284 C51) as well as the reactivating reagent pyridine-2-aldoxime methoiodide (2-PAM) were purchased from Sigma Chemie GmbH (Deisenhofen, FRG).

Controlled pore glass Aminopropyl-CPG-170-A (120 - 200 mesh; with 0.2 mmol amino groups/g) was from Fluka Chemie AG (Buchs, Switzerland). Polymer beads with oxiran groups on the surface (300 µmol/g; particle size 50 - 200 µm) were obtained from Riedel-de Haen AG (Seelze, FRG). Nylon nets (with pore sizes of 30 and 60 µm) for sealing the enzyme reactors were purchased from Reichelt Chemietechnik GmbH + Co (Heidelberg, FRG).

All other chemicals used were of analytical-reagent grade.

3.2. Immobilization of the enzymes

The enzymes acetylcholine esterase from electric eel and butyrylcholine esterase from horse serum were used because they are available with high specific activities - a fact that is essential for the immobilizazion of the enzymes. We tried to immobilize both enzymes on different materials, such as controlled pore glass (modified with aminopropyl groups) or polymer particles (with oxiran groups on the surface). The glass or polymer beads

with the immobilized enzyme were filled in enzyme reactors with a reactor length of 1 cm and a volume of approximately 70 µl. The enzyme reactors were sealed on both ends with nylon nets and stored in buffer solution at 4 °C in a refrigerator untill they were used.

3.2.1. Immobilization on aminopropyl-CPG with carbodiimide

3.1 mg of acetylcholine esterase (620 units) or 2.2 mg of butyrylcholine esterase (677 units) was dissolved in 3.0 ml of 0.1 M phosphate buffer pH 7.0. After the addition of 0.2 g of aminopropyl-CPG and 50 mg of N-ethyl-N´(3-dimethylaminopropyl)-carbodiimide hydrochloride (EDC), the solution was stirred for one hour at room temperature and stored at 4 °C for 24 hours in a refrigerator. The CPG was washed with cold 0.1 M phosphate buffer pH 7.0 and stored in the same buffer at 4 °C.

3.2.2. Immobilization on aminopropyl-CPG with glutaraldehyde

This immobilization method was adapted from a published procedure [7]. One ml of a 2.5 % solution of glutaraldehyde in 0.1 M phosphate buffer pH 7.0 was added to 0.2 g of aminopropyl-CPG. Before and after addition of the CPG, nitrogen was bubbled through the glutaraldehyde solution. After standing for one hour, the CPG was washed with water. 3.47 mg of acetylcholine esterase (694 units) or 1.8 mg of butyrylcholine esterase (648 units) were dissolved in 3.0 ml of cold 0.1 M phosphate buffer pH 6.0. The preactivated CPG was added to the enzyme solution and left to stand in a refrigerator at 4 °C for 2.5 or for 24 hours, respectively. The CPG was washed with cold 0.1 M phosphate buffer pH 6.0 and stored in the same buffer at 4 °C.

3.2.3. Immobilization on polymer particles via oxiran groups

3.40 mg acetylcholine esterase (646 units) or 1.03 mg of butyrylcholine esterase (317 units) were dissolved in 3.0 ml of 1 M potassium phosphate buffer pH 7.5. Then 2.53 or 1.59 mg of VA-Epoxy Biosynth (polymer beads with oxiran groups on the surface) were added, respectively. After two days of storage in a refrigerator at 4 °C, the polymer beads were washed with 0.1 M phosphate buffer of pH 7.4 and stored in 0.1 M phosphate buffer pH 7.0 at 4 °C.

3.3. The enzyme substrates

The enzyme substrates (Substrate A and Substrate B) are both highly soluble in water and water/solvent mixtures. The substrate solutions show a yellow colour and the absorption maxima in destilled water are at about 390 nm, whereas the products of the enzymatic hydrolysis are blue with absorption maxima at about 580 nm (Fig. 2).

The substrates display a good stability in destilled water, whereas they are less stable in solvents like ethanol or dioxan. In addition, they are also not stable in aqueous buffered solutions. Only in mixtures of water and cellosolve (2-ethoxy-ethanol) the stability of the substrate was highly improved. Unfortunately cellosolve led to a rapid decrease in enzyme activity which may be due to inhibition or denaturation of the enzyme. Therefore only substrates dissolved in distilled water were used. Figs. 3 and 4 show the spontaneous hydrolysis of the substrates in distilled water as a function of time and temperature. The solid substrates, which are orange-red cristalls, were stored below 0 °C under exclusion of moisture. No changes were observed over a period of several weeks.

Figs. 2, 3 & 4

3.4. The inhibitors

Numerous inhibitors of the enzymes acetyl- and butyrylcholine esterase are known [8]. We chose three representative examples of the most important substance groups: an organophosporus compound (paraoxon), a carbamate (pyridostigmine bromide) and a quarternized ammonium ion (BW 284 C51).

From paraoxon (liquid, 95 %) a 0.16 M stock solution was prepared in acetone. Aqueous 160 µM stock solutions were obtained by diluting this solution with destilled water. Pyridostigmine bromide and BW 284 C51 were cristalline and were dissolved in distilled water directly. The aqueous carbamate and paraoxon solutions were prepared fresh every day. For decontamination, the pesticide solutions and the contaminated materials were treated with 0.1 M solution of potassium hydroxide to hydrolyze paraoxon and pyridostigmine. BW 284 C51 was destroyed with the help of an alkaline solution of potassium permanganate.

3.4.1. Paraoxon (Diethyl-p-nitrophenylphosphate; E 600)

Paraoxon (Fig. 5a) is a well known example of the organophosphorus pesticides. The oral lethal dose LD50 is 1.8 mg/kg for rats and 5 mg/kg for men. Paraoxon is also a metabolite of the less toxic parathion (E 605) which has found wide application as pesticide. It is transformed into the highly toxic paraoxon in the body and the lethal dose is 300 - 400 mg for an adult man [2,4,17].

Paraoxon inhibits both, acetyl- and butyrylcholine esterase irreversibly by phosphorylation of the active site of the enzyme. Although the spontaneous regeneration of the enzyme is very slow (with half-life times of the phosphorylated enzyme in the order of days), it is possible to reactivate the enzyme with substances like pyridine-2-aldoxime-methoiodide (2-PAM, Pralidoxim). This reactivation is possible before the diethylphosphate group is partially hydrolyzed ("aging" of the phosphorylated enzyme) [1,3]. Since aging is very slow in the case of paraoxon as the inhibitor, the reactivation with 2-PAM occurs fast [11,13,14].

Fig. 5

3.4.2. Pyridostigmine bromide (3-Dimethylaminocarbonyloxy-N-methyl-pyridinium bromide; Mestinon)

Pyridostigmine bromide (Fig. 5b) was chosen, because it also inhibits both, acetyl- and butyrylcholine esterases [18]. The inhibition occurs through carbamylation of the enzyme, but the hydrolysis of the ester formed is fast when compared with the phosphorylated enzyme. The half-life times of carbamylated enzymes are in the order of 1 to several hours (depending on the type of enzyme) [1]. Pyridostigmine has been used as a so called parasympathomimetikum in medicine [2,3].

3.4.3. BW 284 C51 (1,5-bis(4-Allyldimethyl-ammoniumphenyl)-pentane-3-one dibromide)

The compound BW 284 C51 (Fig. 5) is a typical representative of inhibitors of the type of substituted ammonium ions. It is a potent reversible inhibitor of acetylcholine esterase and has a LD50 of 2.1 mg/kg for mice. It can bind to the anionic binding site of the enzyme and it has been used as a selective inhibitor for acetylcholine esterase in medical research [18].

3.5. Buffer solutions

Buffering of the substrate solutions in the enzyme reactor is essential because the enzyme activity and the enzyme inhibition are both pH dependent [6,17]. The addition of sodium

chloride and magnesium chloride may enhance the lifetime of the immobilized enzyme considerably. It was reported, that in the presence of 12 µM $MgCl_2$ and 45 mM NaCl the lifetime was three times higher than in absence of these salts [17]. Therefore all experiments were performed with buffers containing similar salt additions. Depending on the mixing ratio of buffer:substrate:inhibitor solutions we used 0.2 M sodiumphosphate buffer containing 180 mM NaCl and 48 µM $MgSO_4$ for a ratio of 1:1:2 and 0.1 M sodiumphosphate buffers containing 90 mM NaCl and 24 µM $MgSO_4$ for a ratio of 1:1:1. Buffer and substrate solutions had to be separated because the substrate is not stable in buffered solutions especially at pH > 7.

4. Measurements with an UV/VIS-spectrophotometer

The experimental set-up is shown in Fig. 6. The enzyme substrate solutions are mixed with buffer and inhibitor solution via a peristaltic pump and are pumped through an enzyme reactor. Here, the yellow substrate is hydrolyzed by the enzyme and the blue product is formed. In presence of an inhibitor the formation of this blue product is reduced because the enzyme is inhibited. This causes a change in absorbance at 580 nm which can be monitored with an UV/VIS-spectrophotometer.

Fig. 6

The spectrophotometer was a Perkin-Elmer Lamda 5 UV/VIS Spectrophotometer (Perkin-Elmer & Co GmbH, Überlingen, FRG). A flow-through cell with a light path of 1.5 mm from Hellma GmbH & Co (Müllheim, Baden, FRG) was used for the continuous flow measurements. For investigating the substrate stabilities 1x1-cm quartz cuvettes were used. The spectrophotometer allowed to measure absorption spectra in the flow-through cell which was advantageous in the beginning of the studies.

The peristaltic pump was a Gilson Minipuls 3 (Gilson Medical Electronics, Villiers-le-Bel, France) or a MV-CA4 from ISMATEC GmbH (Wertheim, Mondfeld, FRG).

The inhibitor solution represents a drinking or ground water reservoir, from which a sample is drawn continuously. In absence of an inhibitor, destilled water was used instead of the inhibitor solution. The mixing ratio was 1:1:1 for substrate:buffer:inhibitor at the beginning and was changed to 1:1:2 to increase the sensitivity of the method later on.

All measurements were performed at room temperature, i.e. 25 ± 1 °C.

4.1. Measurements with acetylcholine esterase immobilized on aminopropyl-CPG

Immobilization of acetylcholine esterase on aminopropyl-CPG with carbodiimide or glutaraldehyde yielded a material with high enzyme activity and good stability. After storage in a refrigerator (5 °C) for four months, no considerable loss in enzyme activity was observed. An enzyme reactor with acetylcholine esterase immobilized on aminopropyl-CPG with carbodiimide could be used for more than 50 hours (over a period of two weeks) in continous flow and was exposed to numerous inhibition tests with paraoxon, pyridostigmine or BW 284 C51. Enzyme reactors which were not in use, were stored at 5 °C in a refrigerator.

Fig. 7 shows the pH-dependence of the hydrolysis of Substrate A with a fresh prepared enzyme reactor. A broad pH-optimum from approximately pH 5.5 to 9.0 can be observed, which is due to a high enzyme activity in the enzyme column. A change in the flow-rate did not affect the results in the range of 0.5 to 1 ml/min.

Fig. 7

4.1.1. Inhibition with paraoxon

The inhibition of acetylcholine esterase with paraoxon is shown in Fig. 8. The changes in absorbance were measured after a time of 21 minutes. Paraoxon is an irreversible inhibitor of the enzyme. Therefore the concentration of the blue product decreases continuously with time since more enzyme gets inhibited. After the inhibition reaction, the reactivation was performed with 0.1 mM solution of 2-PAM and the enzyme activity was restored (Fig. 9). The detection limit was about 0.2 µM of paraoxon using this method.

Figs. 8 & 9

Investigation of the pH-dependence of the inhibition reaction showed an optimal pH-range of approximately 7.5 to 8.5 (Fig. 10). The effect of the flow-rate on the inhibition is shown in Fig. 11. The signal changes increased in the range of 0.4 to 2.0 ml/min.

Figs. 10 & 11

4.1.2. Inhibition with pyridostigmine bromide

The inhibition of acetylcholine esterase immobilized on aminopropyl-CPG with pyridostigmine bromide is shown in Fig. 12. The changes in absorbance were measured after 21 minutes, although - in contrast to paraoxon inhibition - a steady-state response is established after some time. The limit of detection was about 1 µM of pyridostigmin. The regeneration times were 15 to 30 minutes and depended on the concentration of the inhibitor. Reactivation of the enzyme occured spontaneously and was not influenced by substances like 2-PAM.

Fig. 12

4.1.3. Inhibition with BW 284 C51

Fig. 13 depicts the inhibition of acetylcholine esterase immobilized on aminopropyl-CPG with the reversible inhibitor BW 284 C51. A steady-state was observed after a time of about 5 to 15 minutes (Fig. 14). The regeneration times varied from 8 to 25 minutes (depending on the concentration of the inhibitor). The detection limit was approximately 10 nM of BW 284 C51.

Figs. 13 & 14

An increase in the flow-rate caused an increasing sensitivity (Fig. 15). The reason may be the high affinity of the enzyme to the inhibitor. Because of the two positive charges BW 284 C51 is more readily bound to the anionic binding site of the enzyme than the enzyme substrate.

Fig. 15

4.2. Measurements with acetylcholine esterase immobilized on VA-Epoxy-Biosynth

VA-Epoxy-Biosynth polymer beads with immobilized acetylcholine esterase also showed high enzyme activity and were suitable for inhibition tests. The inhibition of acetylcholine esterase with paraoxon is shown in Fig. 16. The signal changes were again measured after 21 minutes. The limit of detection was approximately 0.5 µM paraoxon and the reactivating times ranged from 10 to 20 minutes.

Fig. 16

4.3. Measurements with immobilized butyrylcholine esterase

The immobilization of butyrylcholine esterase was less successful than the immobilization of acetylcholine esterase. Enzyme reactors which were filled with butyrylcholine esterase immobilized on aminopropyl-CPG with carbodiimide showed almost no enzyme activity. Substrate B and Substrate A were not hydrolyzed. Immobilization of butyrylcholine esterase on aminopropyl-CPG with glutaraldehyde yielded better results. Fig. 17 shows the pH-dependence of the hydrolysis of Substrate B. A distinct pH-optimum of pH 7 can be observed. The signal was dependent on the flow-rate (Fig. 18) which indicates a low enzyme activity on the carrier material. At pH 7.5 and at a flow-rate of 1.8 ml/min only 50 % of the substrate were converted into the blue product. Enzyme reactors with butyrylcholine esterase immobilized on VA-Epoxy-Biosynth also showed low enzyme activities. At pH 7.5 and at a flow-rate of 1.8 ml/min only 25 % of the substrate were hydrolyzed.

Immobilized butyrylcholine esterase was inhibited by paraoxon or pyridostigmine, but almost no reactivation of the inhibited enzyme was observed. After inhibition with paraoxon it was, for example, not possible to reactivate the enzyme with 2-PAM. Only a small part of the enzyme activity was restored. Even inhibition with pyridostigmine was irreversible. Therefore it was not possible to determine detection limits or calibration graphs because each enzym reactor could be used for one inhibition test only before it had to be replaced. For that reason enzyme reactors with immobilized butyrylcholine esterase were not suitable for investigation and test purposes. Nevertheless, they could be used in a pesticide alarm system, where a single response is sufficient.

Figs. 17 &18

5. Measurements performed with a fiber optic photometer and a laser

Fig. 19 shows the experimental set-up for the measurements with the fiber optic photometer. The arrangement was the same as described in Chapter 4. Instead of the UV/VIS spectrophotometer, the 3-Lambda-Photometer from the Institute for Optical Sensors (Joanneum Research, Graz, Austria) was used. This photometer is equipped with solid-state components, such as light-emitting diodes (LED´s) as light sources and photodiodes as detectors. The photometer was connected to the flow-through cell with plastic fiber light guides. The flow-through cell was made of stainless steel plates with a teflon spacer in the centre. The light path through the cell was 2.5 mm long. In addition, the photometer signal was recorded with a Gould BS-273 three-channel recorder (Gould Bryans Instruments Ltd., Mitcham, Surrey). For all measurements, a yellow LED was used as the light source.

For measurements with the laser as the light source, a Helium-Neon-Laser (PMS Electro-Optics, Boulder, Colorado, USA) with an emission wavelength of 612 nm was used. The detector was a lightwave multimeter 8153A equipped with an optical head 81520A from Hewlett-Packard (Vienna, Austria). Plastic fibers with a thickness of 1000 µm and glass fibers with a thickness of 125 µm, as well as optical fiber couplers, were obtained from Hirschmann (Vienna, Austria).

Fig. 19

5.1. Measurements with the 3-Lambda-Photometer

For testing the 3-Lambda-Photometer the sample flow passed first the flow-through cell of the UV/VIS spectrophotometer and second the flow-through cell of the fiber-optic photometer in order to perform simultaneous measurements with two detectors. For most of the experiments, an overall length of 10 meters of plastic fibers was used. It was shown, that almost no differences could be observed between the results obtained with both photometers, although the fiber-optic photometer did not use a reference beam.

The inhibition of acetylcholine esterase (immobilized on polymer beads) with paraoxon is shown in Fig. 20. The results are identical with that from Fig. 16, which were obtained with the spectrophotometer. Only minor differences can be observed between the two calibration graphs.

Fig. 20

The inhibition of acetylcholine esterase immobilized on aminopropyl-CPG with pyridostigmine is shown in Fig. 21. The calibration graph is almost identical with that from Fig. 12, which was measured simultaneously.

Fig. 21

A total of 90 meters of plastic fibers was used in the measurement shown in Fig. 22. The main difference between the measurements with 10 and 90 meters of plastic fibers was the smaller signal/noise ratio when 10 meters of plastic fibers were used. The limit of detection was approximately 30 nM for BW 284 C51. However, a length of 100 meters of plastic fibers appeared to be the upper limit when using the 3-Lambda-Photometer with a LED as the light source.

Fig. 22

5.2. Measurements with a laser

The inhibition of acetylcholine esterase immobilized on aminopropyl-CPG with BW 284 C51 (Fig. 22) was repeated with a He-Ne-laser as the light source. The result (Fig. 23) is comparable to that obtained with the 3-Lambda-Photometer despite some differences in the central part of the calibration graph. 90 meters of plastic fibers were used again, but the signal/noise ratio was not as high as with the 3-Lambda-Photometer. This may be due to problems with coupling the light of the laser into the fiber and to laser instabilities. Little changes in the connection of fiber coupler and laser resulted in high signal fluctuations. The detection limit was approximately 50 nM for BW 284 C51.

Fig. 23

Nevertheless, these measurements demonstrate the usefulness of a laser as a light source. With the high output of a laser combined with the use of glass fibers it is possible to measure the signal changes which occure during the inhibition of choline esterases over large distances. A detection of inhibitors over a distance of about 100 meters is possible with the orange He-Ne-laser and with 1000-µm plastic fibers. With the same laser and 125-µm glass fibers measurements can easily be performed over a distance of about 1 kilometer.

6. Discussion

The results demonstrate, that it is possible to detect inhibitors of the enzymes acetyl- and butyrylcholine esterase under the applied conditions on-line, i.e. continuously over a period of several days. The use of optical fibers allows measurements over large distances. With the novel and robust fiber-optic 3-Lambda-Photometer, which is equipped with light emitting diodes, photodiodes and optical plastic fibers, it is possible to measure over a distance of approximately 50 meters from the place where the samples are drawn. Distances of up to one kilometer can be acchieved if lasers and glass fibers are used.

The detection limits for paraoxon of 200 nM (= 55 µg/l) and for BW 284 C51 of 10 nM (= 5.7 µg/l) are acceptable, whereas the detection limit of 1 µM (= 0.26 mg/l) for pyridostigmine is not. However, the sensitivity of the method can be increased. It was shown that the optimal temperature for the inhibition of acetylcholine esterase with

paraoxon is about 30 °C [17]. All measurements presented here were performed at room temperature. Not only the temperature, but also the flow-rate could be increased to enhance the sensitivity of the method towards the inhibitors (Figs. 11 & 15). However, this would lead to an additional consumption of enzyme substrate and a shorter lifetime of the immobilized enzyme. The mixing ratio of substrate:buffer:inhibitor solutions could also be changed in favour of the inhibitor solution. It is also known, that choline esterase enzymes from different sources show differing sensitivities towards the various inhibitors [20]. For the detection of a certain pesticide it would be possible to choose another more appropriate enzyme. Finally the signal/noise ratio of the measuring system can be improved through optical and electronical refinements. With such an optimized system, very small signal changes can be recognized and the detection limits could be lowered by one or two orders of magnitude.

For the determination of BW 284 C51 and pyridostigmine, no data were available from the literature. The determination of paraoxon has been described several times. In a radiometric method with an incubation time of 60 minutes and a total time requirement of at least two hours the detection limit was as low as 4.29×10^{-10} M paraoxon [11]. In a colorimetric method the incubation time was two hours and the whole procedure lastet ca. 2.5 hours [11]. A very tedious procedure with an immunoassay coupled to an enzymatic reaction (total time consumption ca. 2.5 hours) resulted in a detection limit of 1 nM paraoxon [11].

The method presented here doese not require radioactivity or antigenes. A detection limit of 200 µM paraoxon after a measuring time of 21 minutes seems to be very acceptable especially in view of the possible enhancement through opto-electronics. It would be no problem to measure the signal changes caused by the inhibition process after one hour and to increase the sensitivity. For practical purposes, a method which gives a signal change after one hour is still more useful than a method which requires two hours, especially in a pesticide alarm system.

In a flow injection analysis system (FIA) a rapid and somewhat sensitive determination of paraoxon was possible [17]. Using this method, 60 samples per hour with a detection limit of 400 nM paraoxon or 30 samples per hour (in the stopped-flow mode) with a detection limit of 8 nM were measured. Both, the inhibitor and the substrate solutions, were injected into a buffer carrier stream. The synthetic substrate was hydrolyzed in an enzyme reactor and the product reacted with a second reagent to form a dye whose absorption was measured at 500 nm. According to the authors, the rapid determination of the pesticide was possibl because inhibitor and substrate reached the enzyme at the same time and a competition in binding to the active site occured. No long incubation times were necessary. This method seems to be applicable to our system and will be investigated in the near future. A rapid analysis of small sample volumes is advantageous in many cases, although a more complex and expensive instrumentation is required.

The method proposed in this work could be used for continuously monitoring a drinking or ground water reservoir. The signal change produced for example by an organophosporus or carbamate pesticide may serve as an alarm to switch of the water supply or to start more detailed investigations, such as qualitative and quantitative analysis or search for the origins of the pesticides. It would also be of interest to test the response of the system towards the so-called nerve gases, since these substances are closely related to the organophosphorus pesticides. It is known that these chemical warfare agents are very potent inhibitors of the enzymes acetyl- and butyrylcholine esterase. Therefore these compounds must be detectable with our system. The identification of nerve gases over large distances could provide a simple and sensitive alarm system, not only in cases of war but also in case of an accident in the production, transport or destruction of such substances.

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Figures

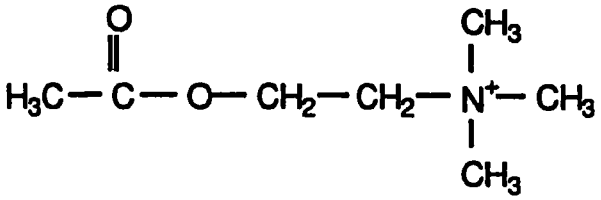

Fig. 1. Acetylcholine

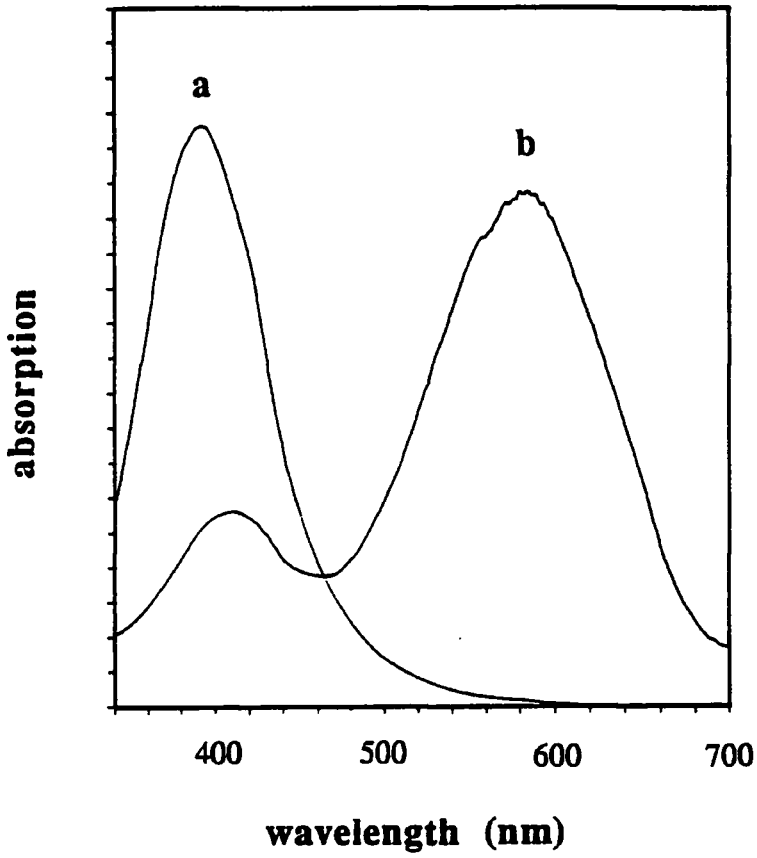

Fig. 2. Absorption spectra of Substrate A (a) and its product of hydrolysis (b) at pH 7.5

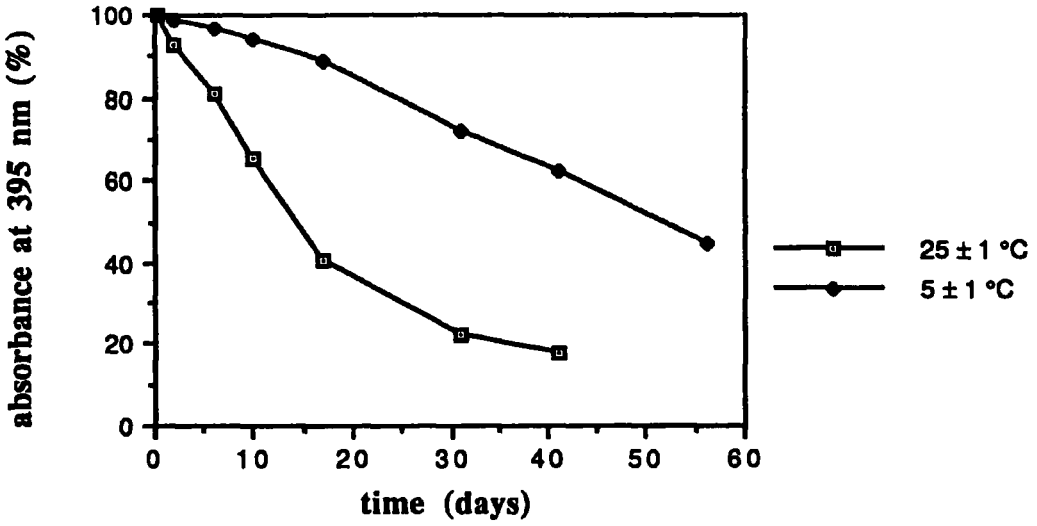

Fig. 3. Stability of Substrate A in destilled water at 25 ± 1 °C and at 5 ± 1 °C in the dark

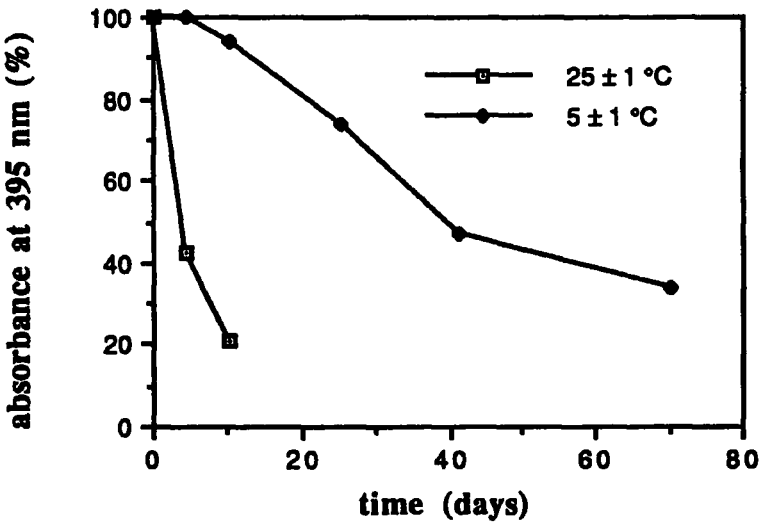

Fig. 4. Stability of Substrate B in destilled water at 25 ± 1 °C and at 5 ± 1 °C in the dark

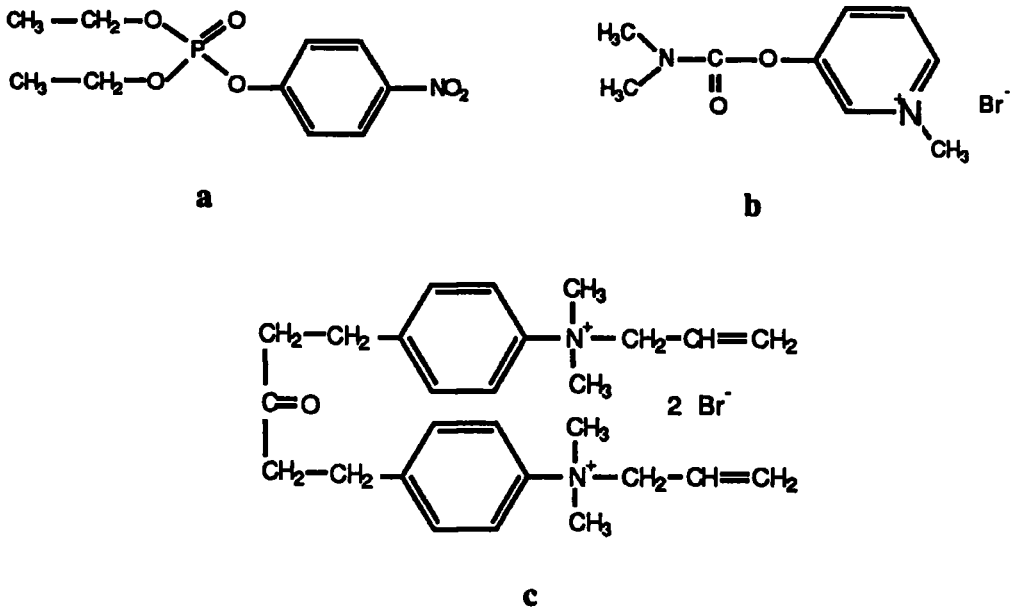

Fig. 5. (a) Paraoxon; (b) pyridostigmine bromide; (c) BW 284 C51

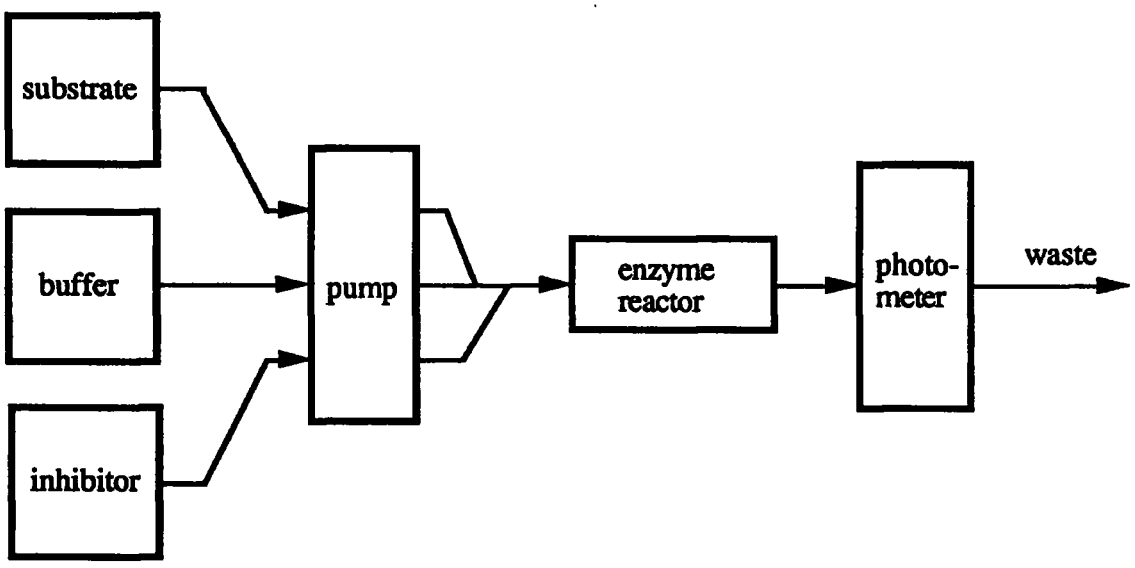

Fig. 6. Experimental set-up for measurements with an UV/VIS-spectrophotometer

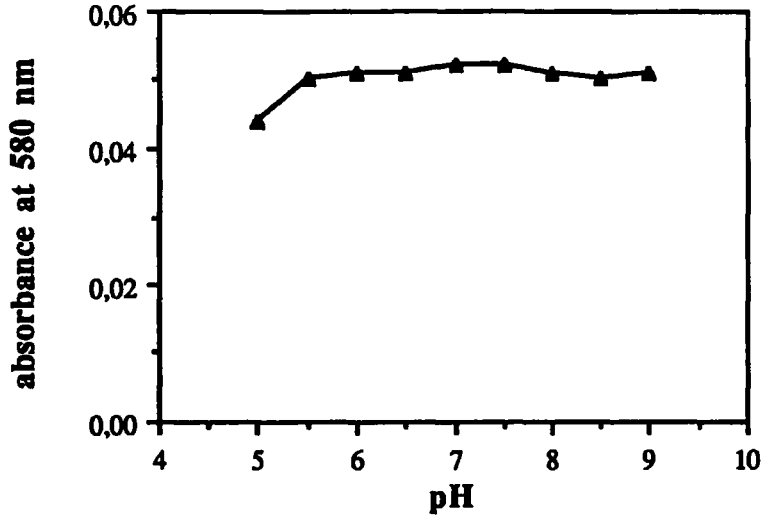

Fig. 7. pH-dependence of the enzymatic hydrolysis of Substrate A at a flow-rate of 0.58 ml/min.

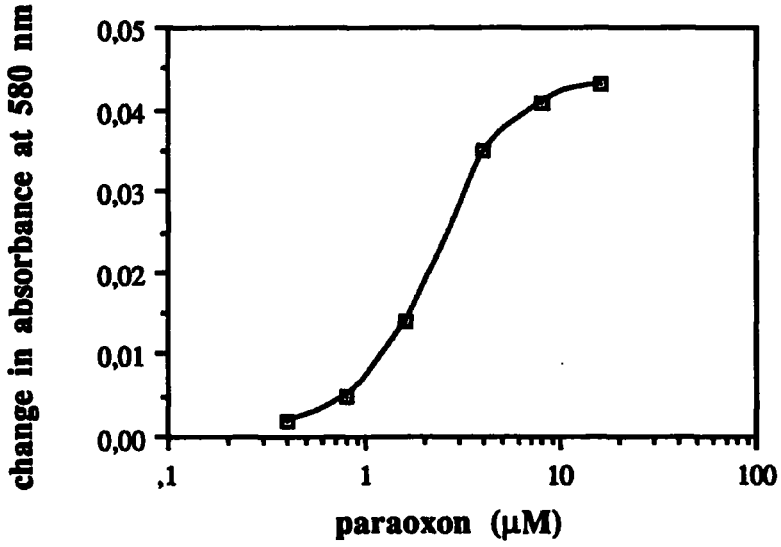

Fig. 8. Inhibition of acetylcholine esterase with paraoxon - calibration graph (signal changes after 21 min; pH 7.5; flow-rate: 1.8 ml/min)

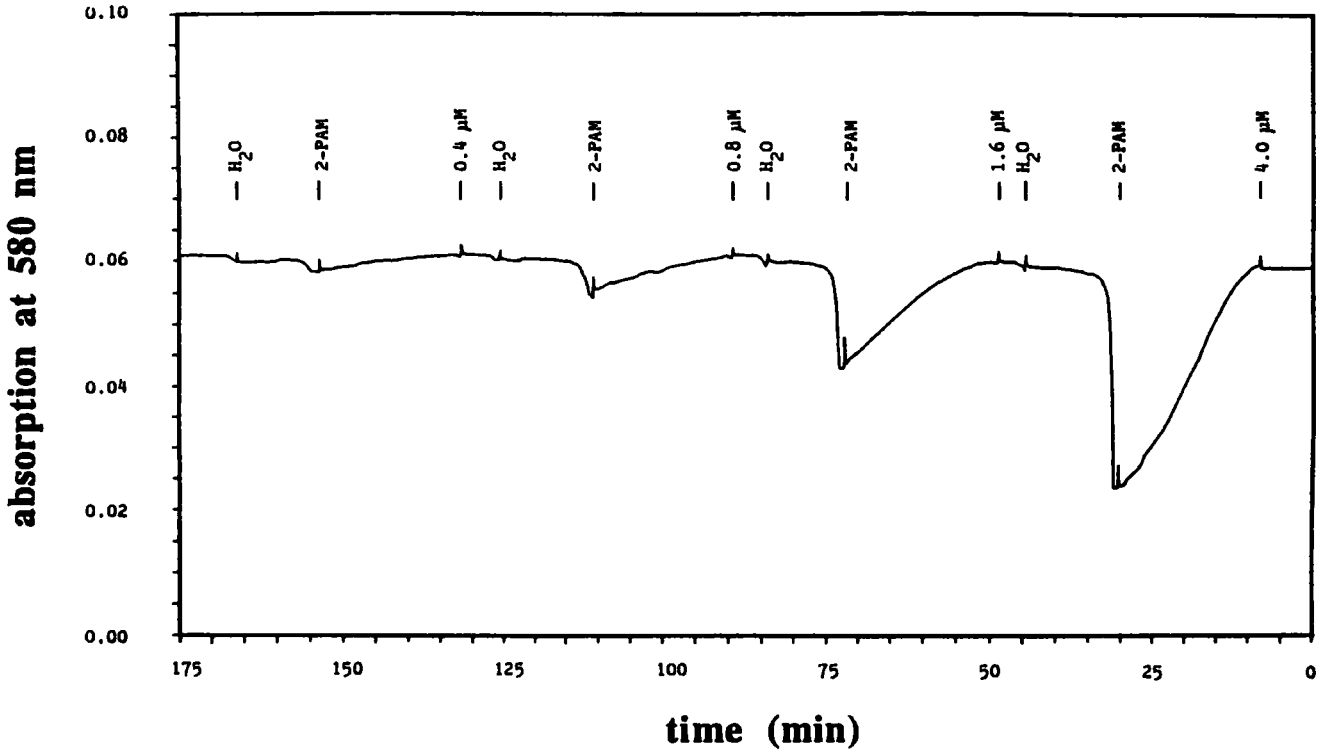

Fig. 9. Inhibition of acetylcholine esterase with paraoxon - time dependence (pH 7.5; flow-rate: 1.8 ml/min)

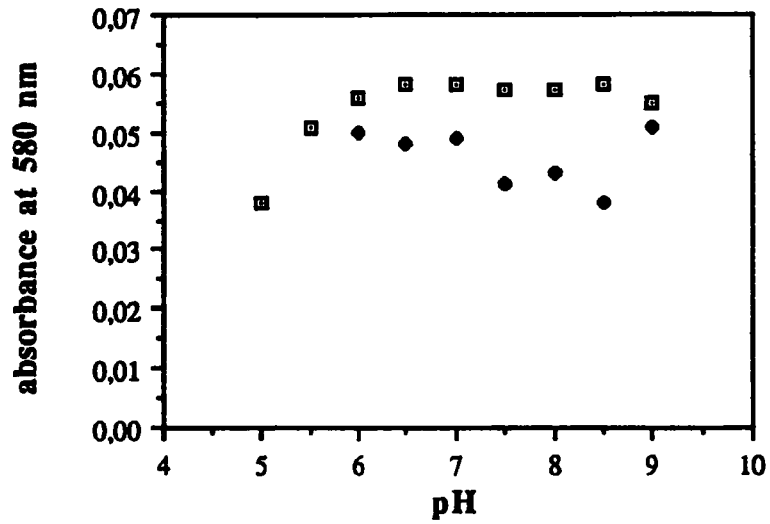

Fig. 10. Inhibition of acetylcholine esterase with paraoxon - pH-dependence (signal changes after 21 min; flow-rate: 1.46 ml/min)

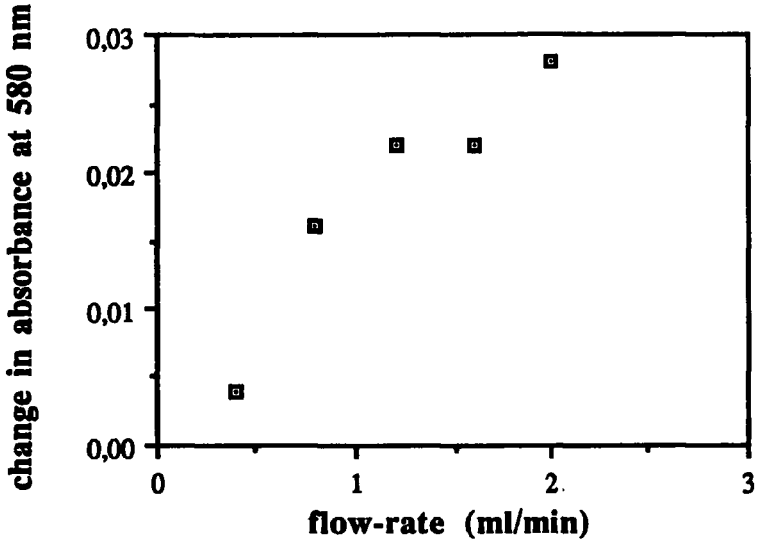

Fig. 11. Inhibition of acetylcholine esterase with paraoxon - flow-rate dependence (signal changes after 21 min; pH 7.5)

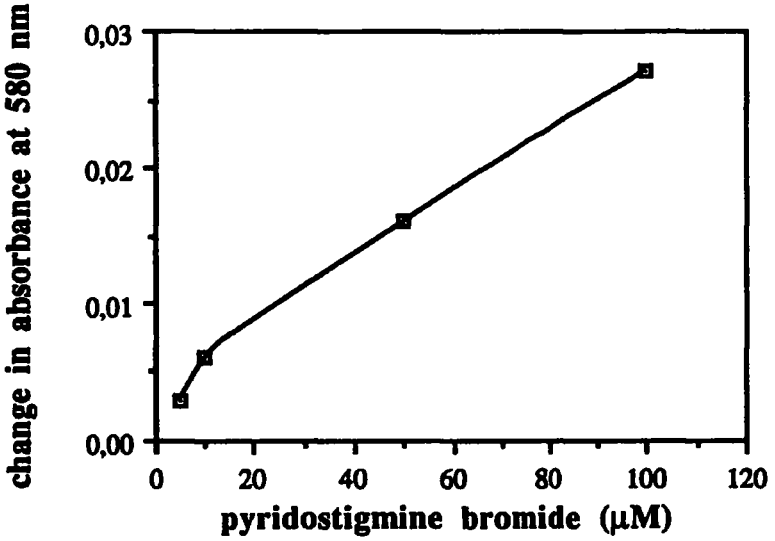

Fig. 12. Inhibition of acetylcholine esterase with pyridostigmine - calibration graph (signal changes after 21 min; pH 7.5; flow-rate: 1.8 ml/min)

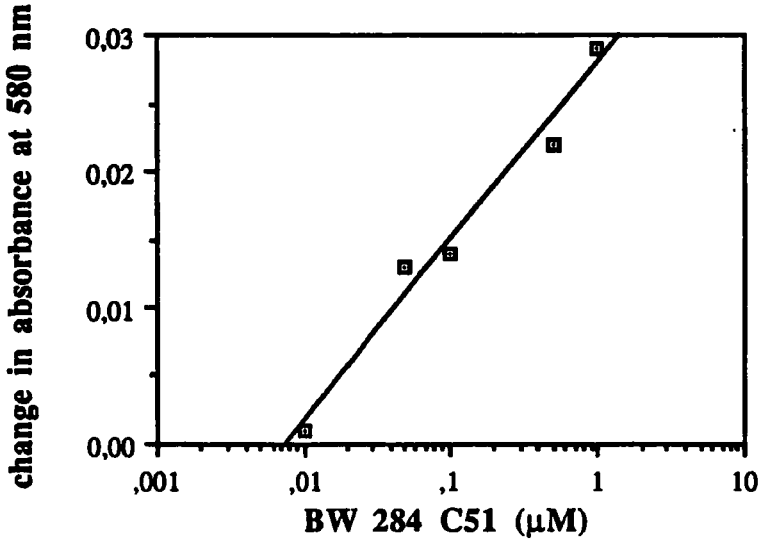

Fig. 13. Inhibition of acetylcholine esterase with BW 284 C51 - calibration graph (steady-state response; pH 8.0; flow-rate: 1.2 ml/min)

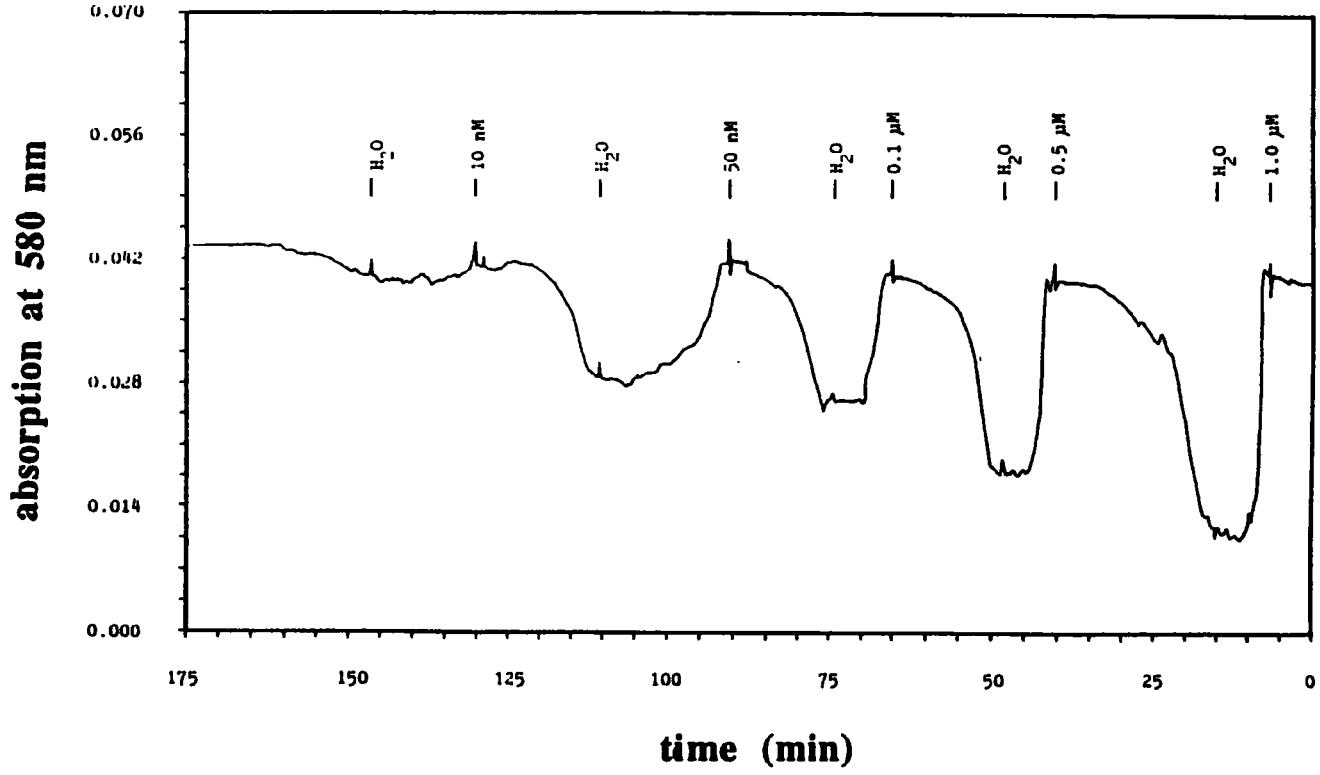

Fig. 14. Inhibition of acetylcholine esterase with BW 284 C51 - time dependence (pH 8.0; flow-rate: 1.2 ml/min)

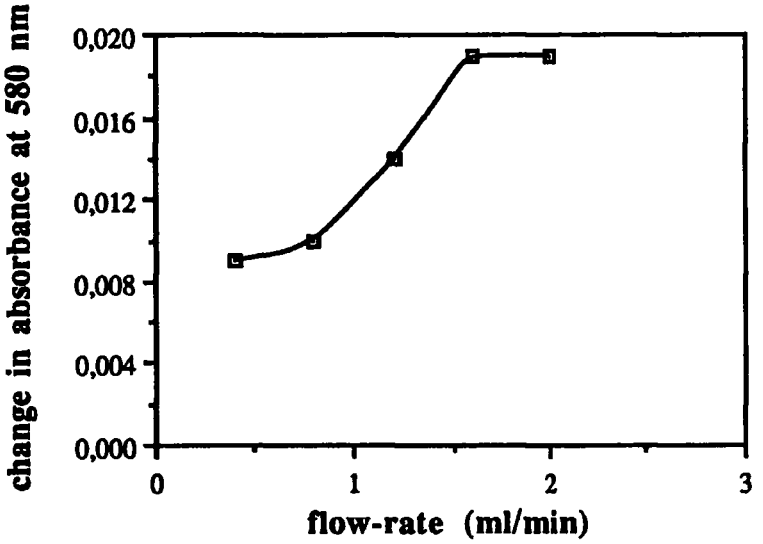

Fig. 15. Inhibition of acetylcholine esterase with 0.1 µM BW 284 C51 - flow-rate dependence (steady-state response; pH 8.0; flow-rate: 1.2 ml/min)

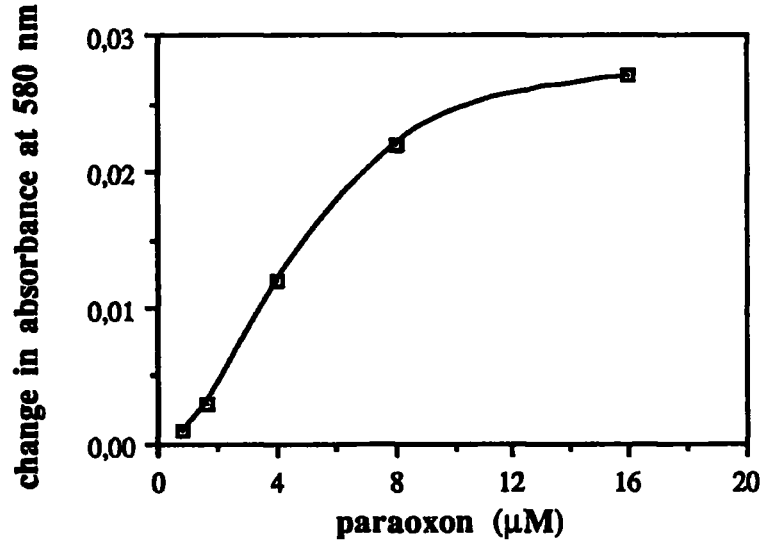

Fig. 16. Inhibition of acetylcholine esterase with paraoxon - calibration graph (signal changes after 21 min; pH 7.5; flow-rate: 1.8 ml/min)

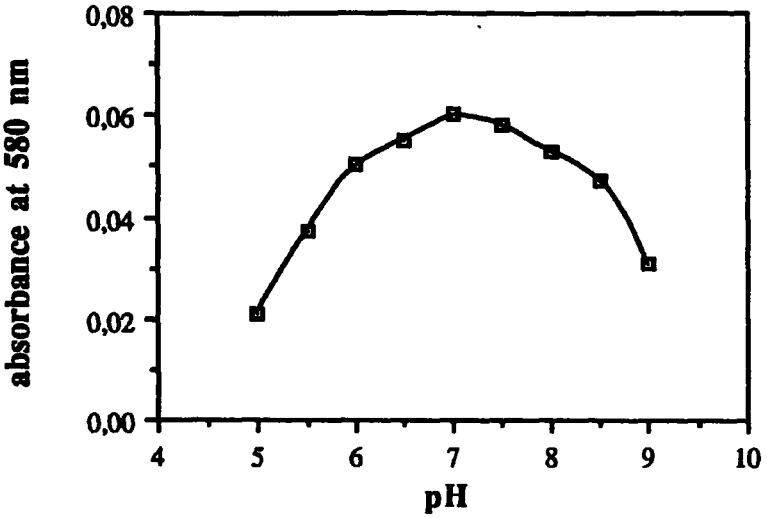

Fig. 17. pH-dependence of the hydrolysis of Substrate B by butyrylcholine esterase immobilized on aminopropyl-CPG with glutaraldehyde (flow-rate: 1.8 ml/min)

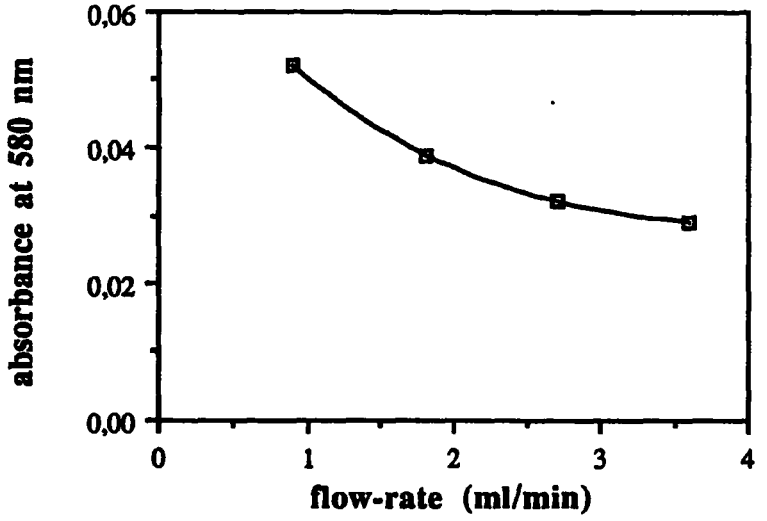

Fig. 18. Flow-rate dependence of the hydrolysis of Substrate B by butyrylcholine esterase immobilized on aminopropyl-CPG with glutaraldehyde (pH 7.5)

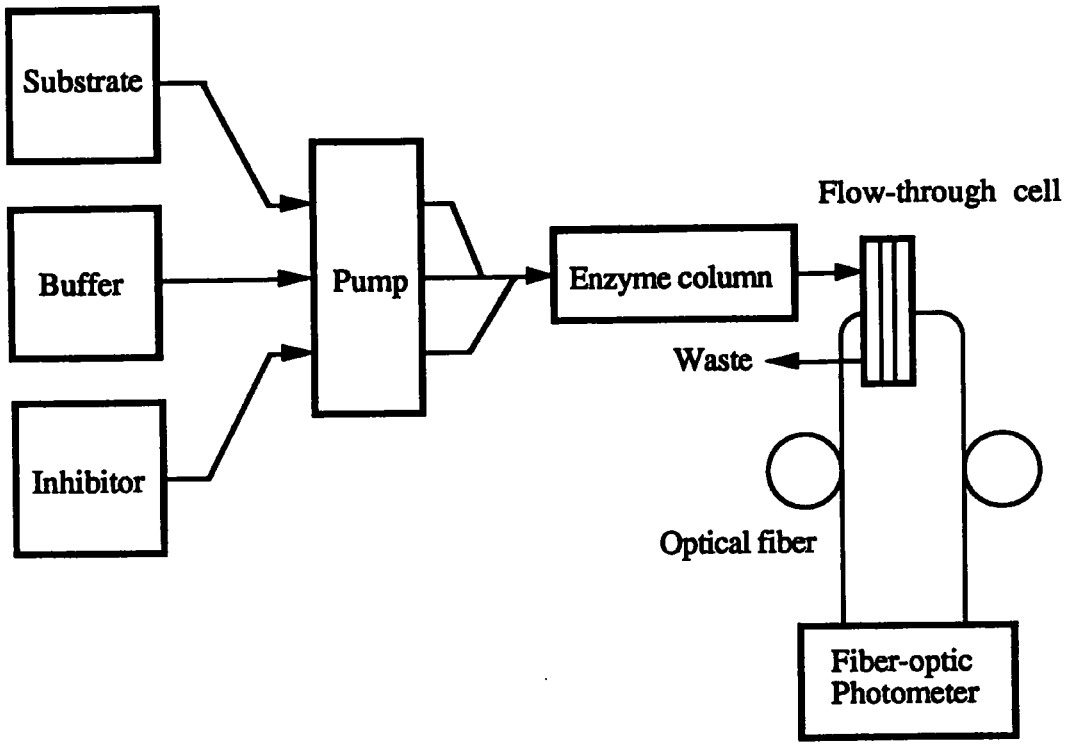

Fig. 19. Experimental set-up for measurements with a fiber-optic photometer

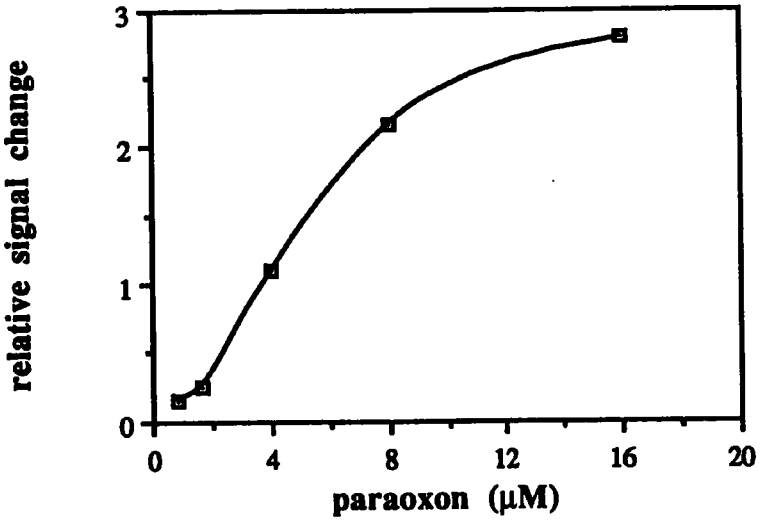

Fig. 20. Inhibition of acetylcholine esterase immobilized on VA-Epoxy-Biosynth with paraoxon (signal changes after 21 min; pH 7.5; flow-rate: 1.8 ml/min)

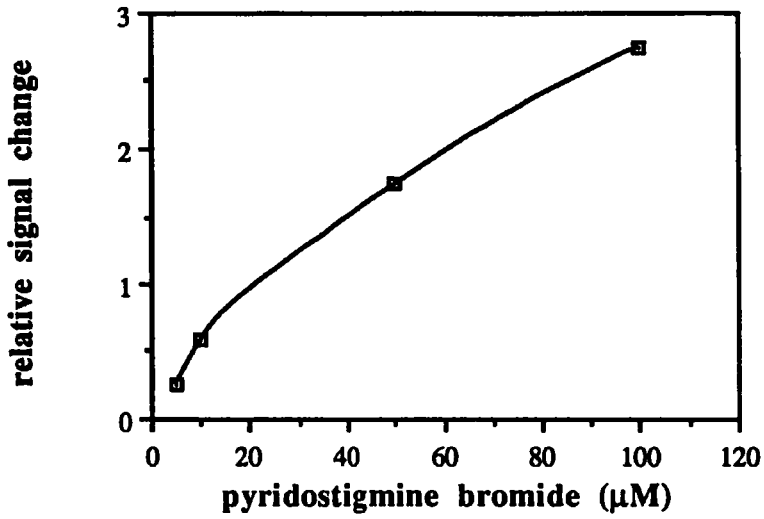

Fig. 21. Inhibition of acetylcholine esterase immobilized on aminopropyl-CPG with pyridostigmine (signal changes after 21 min; pH 7.5; flow-rate: 1.8 ml/min)

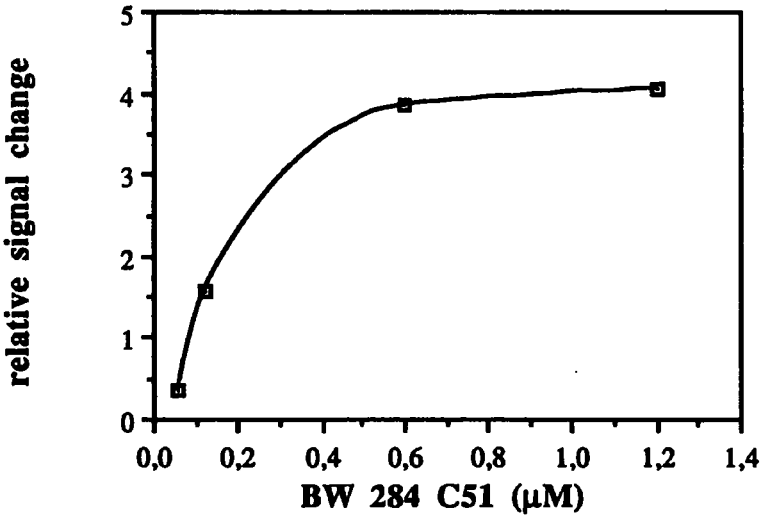

Fig. 22. Inhibition of acetylcholine esterase immobilized on aminopropyl-CPG with BW 284 C51 (steady-state response; pH 7.5; flow-rate: 1.8 ml/min)

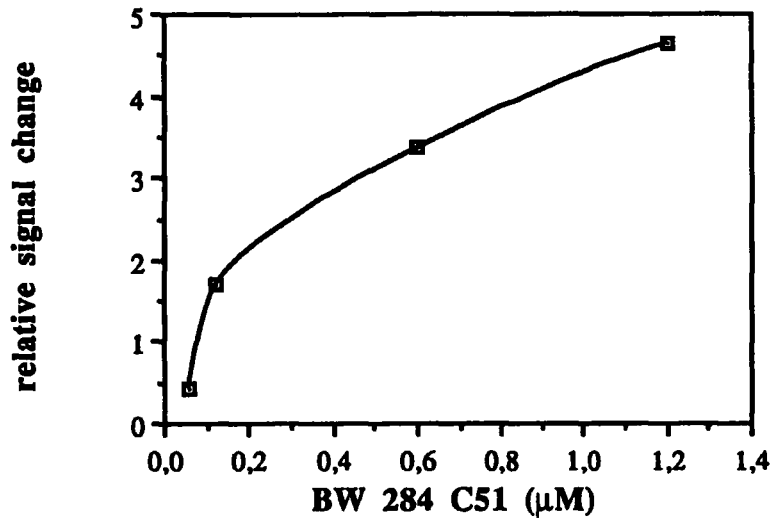

Fig. 23. Inhibition of acetylcholine esterase immobilized on aminopropyl-CPG with BW 284 C51 (steady-state response; pH 7.5; flow-rate: 1.8 ml/min)

CONFERENCE ON DISARMAMENT

CD/1077
23 May 1991

Original: ENGLISH

LETTER DATED 22 MAY 1991 FROM THE ACTING REPRESENTATIVE OF THE UNITED STATES OF AMERICA ADDRESSED TO THE PRESIDENT OF THE CONFERENCE ON DISARMAMENT TRANSMITTING A STATEMENT ISSUED BY THE PRESIDENT OF THE UNITED STATES OF AMERICA CONCERNING THE UNITED STATES INITIATIVE FOR COMPLETING THE NEGOTIATIONS ON A CHEMICAL WEAPONS CONVENTION, AND A WHITE HOUSE FACT SHEET ON THE INITIATIVE

I have the honour to forward to you the attached statement issued by the President of the United States, Mr. George Bush, concerning the United States initiative for completing the negotiations on a Chemical Weapons Convention, and a White House Fact Sheet on the initiative.

I ask that you take the appropriate steps to enter this statement and fact sheet as official documents of the Conference on Disarmament and to have them distributed to all member delegations and non-member States participating in the work of the Conference.

(Signed) M. LYALL BRECKON
Acting Representative of the
United States of America to
the Conference on Disarmament

GE.91-60919/6239a

THE WHITE HOUSE

Office of the Press Secretary

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13 May 1991

STATEMENT BY THE PRESIDENT ON CHEMICAL WEAPONS INITIATIVE

The Gulf war has once again raised the spectre of chemical weapons and demonstrated that unscrupulous régimes can and will threaten innocent populations with these weapons of terror so long as we permit them to exist. These stark events renew and reinforce my conviction, shared by responsible leaders around the world, that chemical weapons must be banned - everywhere in the world.

The world's best hope for this goal is the Chemical Weapons Convention now being negotiated by the Conference on Disarmament in Geneva. The United States is committed to the early, successful completion of this Convention and I am today announcing a number of steps we will take to accelerate the negotiations and achieve an effective chemical weapons ban as soon as possible. I hope this initiative also will spur other nations to commit themselves equally to this critical objective.

I have instructed the United States negotiating team in Geneva to implement my decisions at the next session which begins 14 May. To demonstrate the United States commitment to banning chemical weapons, we are formally foreswearing the use of chemical weapons for any reason, including retaliation, against any State, effective when the Convention enters into force, and will propose that all States follow suit. Further, the United States unconditionally commits itself to the destruction of all our stocks of chemical weapons within 10 years of entry into force and will propose that all other States do likewise. We will offer technical assistance to others to do this efficiently and safely.

In addition, we will call for setting a target date to conclude the Convention and recommend the Conference stay in continuous session if necessary to meet the target. The United States also will propose new and effective verification measures for inspecting sites suspected of producing or storing chemical weapons. To provide tangible benefits for those States that join the Convention and significant penalties for those that fail to support it, the United States will propose the Convention require parties to refuse to trade in chemical weapon-related materials with States that do not join in the Convention. The United States reaffirms that we will impose all appropriate sanctions in response to violations of the Convention, especially the use of chemical weapons.

These steps can move the world significantly closer to the goal of a world free of chemical weapons. I call upon all other nations to join us in the serious and cooperative pursuit of this important goal.

THE WHITE HOUSE

Office of the Press Secretary

FACT SHEET ON CHEMICAL WEAPONS INITIATIVE

Noting that the recent conflict in the Persian Gulf had brought into play once again the spectre of the use of chemical weapons against innocent populations, the President announced a new series of steps in his long-term goals of ridding the world of these weapons of terror. The President reiterated his belief that the best hope for achieving that goal is the Chemical Weapons Convention (CWC) - a multilateral treaty that would completely ban the production, possession, transfer and use of chemical weapons - under negotiation in the Conference on Disarmament (CD) in Geneva.

The primary purposes of this initiative are to strengthen the prospects of an early successful conclusion of the Convention, to demonstrate the commitment of the United States to achieving an effective ban on CW as soon as possible, and to provide incentives to other nations to commit themselves equally to this critical objective. To this end, the President declared that the United States delegation to the CD would take the following actions when the next session of the talks on the CWC resumes 14 May 1991:

1. The United States will call for the resolution of all major outstanding issues in the CD talks in Geneva on the CWC by the end of 1991 and the completion of the CWC within twelve (12) months.

2. To help reach these goals and to ensure that no time is lost and no opportunity is wasted to bring the negotiations to a successful conclusion soon, the United States will propose that the CW ad hoc negotiating committee of the CD stay in continuous session in Geneva, beginning with the May session. The United States is prepared to keep its ambassador at the table and to reinforce its delegation as necessary to support this schedule.

3. The United States will formally declare its intention to become an original party to the CWC and will call upon all States publicly to commit to becoming original parties to the treaty and to declare their CW stocks.

4. The United States will drop its position that States retain a right of retaliation with CW as long as they have CW stocks if CW are used against them first. The United States will formally foreswear the use of CW for any reason, including retaliation in kind with CW, against any State, effective when the CWC enters into force. The United States will also propose a provision for the CWC prohibiting the use of CW for any reason.

5. The United States will drop its position that we must be allowed to keep 2 per cent of our CW stockpile (500 tons) until all CW-capable States have joined the Convention. The United States will unconditionally commit itself to the destruction of all of its CW stocks and former production facilities within 10 years of entry into force of the CWC. We will call upon all States to follow our lead and to begin the destruction of their CW stocks and production facilities as soon as possible. We will propose provisions for the

CWC that require all parties to begin the unconditional destruction of their CW stocks and production facilities as soon as the CWC enters into force, and to complete their elimination within 10 years of that date.

6. The United States will provide practical and effective help to other States to assist in the speedy, safe and environmentally sound destruction of CW wherever they may be found. We will:

- Create a Task Force comprised of United States Government and private industry representatives to develop proposals on how the United States can advise and assist States in CW destruction.

- Provide technical destruction assistance (e.g., visits to United States destruction facilities, blueprints and technical advice) to States parties that have CW located on their territory.

- Propose the creation of a CD Working Group on CW destruction and offer to provide United States experts to it.

7. The United States will provide extensive information to other States on United States export controls on CW-related materials and technology and our domestic legislation to enforce them. We will call on all States to enact similar controls, thereby enhancing the control of CW proliferation as we work toward a complete and formal ban.

8. Aside from the significant intrinsic benefits that will flow to all parties from a total ban on CW, there should be tangible benefits for those States that join the Convention and enhance its strength, and specific penalties for those States that fail to support it in the most fundamental and important way by not joining it. Therefore, the United States will propose provisions for the CWC that require parties to refuse to trade in CW-related materials with States that do not become parties within a reasonable time after entry into force.

9. The United States will reaffirm our position that there should be sanctions against those States that violate the CWC and especially severe sanctions against any State that initiates the use of CW. The United States declares that it will consider violations of the CWC, especially the initiation of the use of CW, as extremely grave breaches of international law, and that the United States will impose all appropriate sanctions.

10. The United States will reaffirm our commitment to a strong and forthright verification régime. We will offer additional concrete proposals to address the central issue of inspecting suspect sites. We will call on the CD to adopt our position for challenge inspections of such sites.

CONFERENCE ON DISARMAMENT

CD/1078
CD/CW/WP.340
30 May 1991

Original: ENGLISH

LETTER DATED 30 MAY 1991 FROM THE DEPUTY PERMANENT REPRESENTATIVE OF NORWAY TO THE DEPUTY SECRETARY-GENERAL OF THE CONFERENCE ON DISARMAMENT TRANSMITTING A DOCUMENT ENTITLED, "VERIFICATION OF ALLEGED USE OF CHEMICAL WARFARE AGENTS: APPLICATION OF PROCEDURES AFTER A SIMULATED CHEMICAL ATTACK ON AN AIR BASE"

I have the honour to enclose a document entitled, "Verification of alleged use of chemical warfare agents: application of procedures after a simulated chemical attack on an air base".

I would be grateful if this document could be issued as an official document of the Conference on Disarmament as well as in the series of Working Papers for the Ad Hoc Committee on Chemical Weapons.

(Signed) Torbjørn Aalbu
Minister
Deputy Permanent Representative
to the Conference on Disarmament

GE.91-61020

VERIFICATION OF ALLEGED USE OF CHEMICAL WARFARE AGENTS

APPLICATION OF PROCEDURES AFTER A SIMULATED CHEMICAL ATTACK ON AN AIR BASE

Introduction

An extensive study of the possibility of verifying alleged use of chemical weapons was initiated by the Norwegian Ministry of Foreign Affairs in 1981. The research has been carried out by the Division for Environmental Toxicology of the Norwegian Defence Research Establishment at Kjeller near Oslo. The annual reports and working papers submitted to the Conference on Disarmament have been compiled in the publication Contributions by Norway to the conference on Disarmament 1982-1987 (document CD/813 dated 7 March 1988).

The 1988 report was mainly concerned with the development of complete procedures for verification of alleged use of chemical weapons, (CD/857 of 12 August 1988 and CD/861 of 22 August 1988), while the research in 1989 focussed on the development and testing of headspace gas chromatography, a new supplementary technique (CD/936 of 21 July 1989 and CD/940 of 31 July 1989).

The sample preparation method developed by the Norwegian research programme is based on the adsorption of chemical warfare agents from aqueous solutions onto a polymer sorbent and their subsequent removal by an organic solvent. This technique, referred to as sorbent extraction, was optimized in the 1989-1990 programme in order to isolate as efficiently as possible chemical warfare agents and related compounds from different sample materials. The procedure has been made as general as possible for use in screening samples suspected of being contaminated with chemical warfare agents. These results and conclusions were summarized in document CD/1008 dated 26 June 1990, and the research report was presented to the Conference with document CD/1019 dated 23 July 1990.

Based on the work carried out during the Norwegian research programme, a complete procedure for the verification of alleged use of chemical weapons has been developed, including the construction of a mobile field laboratory. This laboratory, contained in a wooden case, holds all the equipment and chemicals needed to carry out sampling, sample preparation and preliminary analyses in the field. The most important parts of this verification procedure are location of the contaminated area, sample collection, field analysis, sample transportation, sample preparation and sample analysis.

When the Chemical Weapons Convention enters into force, the Technical Secretariat will receive the results from the laboratories which analyze samples taken during the inspection of an area where use of chemical weapons is alleged to have taken place. To allow correct conclusions to be drawn from the results provided, it is important that the history of the

samples has been properly recorded. All available information from the inspection of the contaminated area, sampling, sample preparation and transport should be recorded and passed on to the Secretariat. Most of this information should also be passed on to the analytical laboratories, to make it easier to select the best suited analytical method and to evaluate the reliability of the results. It is also important that the samples are sealed and secured to prevent tampering during transport.

During this research programme, the evaluation of verification procedures by field exercises has been emphasized, in order to reveal problems that would not occur during laboratory testing.

This year's report is divided into two parts. The main part is an application of the complete procedures for verification of alleged use of chemical weapons, developed during the Norwegian research programme. It deals with handling of samples from a simulated attack with chemical weapons on an air base. Samples were collected in the area in question and treated in accordance with the procedures. In addition to the samples collected after the simulated attack, some samples of soil, sand, water and protective clothing were spiked with chemical warfare agents in the laboratory, transported to the air base, where they were exposed to the prevailing weather, and then treated in the same manner as the samples collected.

A form has been drawn up on which the sampling team should enter all information acquired during the localization of the contaminated area, sample collection, sample preparation, field analyses and sample transport. A transport log has also been drawn up which would be filled in by the personnel in charge of each section of the transport chain in order to keep a complete record of the history of the samples.

The second part of the report describes further improvement of the procedures for handling samples. This includes testing methods for homogenization of samples, and a comprehensive testing of solvents for extraction of different chemical warfare agents from various sample materials.

The report confirms earlier results on the advantages of the sorbent extraction technique for the detection of chemical warfare agents, and describes further improvements of the sample preparation and handling procedures. The report is a concrete contribution by experts at the Norwegian Defence Research Establishment to the negotiations on a Chemical Weapons Convention closely related to the Protocol on Inspection Procedures (CD/1046, Appendix I, Addendum, Part IV: Procedures in cases of alleged use of Chemical Weapons) and the relevant General Assembly resolutions on measures to uphold the authorities of the 1925 Geneva Protocol, in particular resolution 45/57 C endorsing the proposals of the group of qualified experts concerning technical guidelines and procedures to guide the Secretary-General in the conduct of

timely and efficient investigation of the reports of use of chemical and bacteriological (biological) or toxin weapons (document A/44/561 dated 4 October 1989).

Field exercise

An attack on an air base with chemical warfare agents was simulated by exploding a bottle filled with 200 g of the nerve agent simulant dipropyleneglycol monomethyl ether (DPM) 1.5 m above the ground. After the explosion, all visual evidence was removed before a team from the Norwegian Defence Research Establishment was called upon to verify the alleged use of chemical warfare agents on the air base. This team was unaware of the exact site of the explosion, and was required to identify the contaminated area, carry out field analyses, collect samples and treat them according to the Norwegian procedure, and transport them to the laboratory.

Five hours after the explosion of the simulant the inspection team arrived at the air base, and was transported to the area where eyewitnesses had seen a suspicious explosion of an artillery shell. The inspection was carried out as it would have been after a real incident, and the inspectors used respirators and complete protective clothing throughout the localization and sample collection phases. An area of 100 m x 100 m pointed out by the eyewitnesses was first inspected visually by two members of the team in order to find any remnants from the explosion. This inspection took about 7 minutes, but gave no indication of where the explosion had taken place. The inspection team then used a chemical agent monitor (CAM) and detection paper to localize the possible contaminated area. After 20-25 minutes total search time, an area contaminated with a nerve agent simulant was located; another 10 minutes were used to define the extent of this area. Detection paper was used to confirm the observations made with the CAM. The contaminated area was found to be 15m x 10m.

Twenty samples were collected throughout this contaminated area. Most of the samples were, however, collected near the point which on the CAM showed the highest concentration of the DPM simulant. Samples of about 50 g of soil, sand or water were collected. Reference samples from outside the contaminated area were also collected. The samples were placed in glass bottles with airtight screw caps, coded by sample number and sealed with wax, and then transported back to the laboratory. No further analyses were carried out on these samples.

It is extremely important to record information on the samples collected, the sampling methods and sampling site to allow correct conclusions to be drawn from the results obtained by sample analysis. A three-page form has therefore been drawn up

for use by the sampling team during the inspection. This form is included as an annex to this paper. On the first page, information on the sampling should be entered, including the reason for sampling, an indication of the priority or importance of the samples, description of samples and sampling site, sampling methods and results of field analyses. On the second page, a sketch of the sampling site should be drawn, indicating topography, any bomb craters observed and wind direction. The positions of the sampling sites should also be indicated on this sketch. The third page should be filled in if information on the attack is available. Reports from eyewitnesses, casualties, the effect on vegetation and the weather conditions since the attack should be entered here.

In addition to samples from this simulated attack, samples of 50 g of soil, sand and water, and 0.05 g (20 cm^2) of protective clothing were spiked in the laboratory with 1 mg of each of the nerve agents GA, GB, VX, and the vesicants Lewisite (L) and mustard (H). These samples were placed in closed vessels and transported to the air base where the vessels were opened and the samples exposed to the prevailing weather for 20 hours. Some of these samples were then treated in the field according to the standard Norwegian procedure and the others transported back to the laboratory and used for evaluation of different sample preparation methods.

In order to have a first indication of which chemical was present, some of the samples spiked with real chemical warfare agents were analyzed in the field using thin layer chromatography (TLC). The agents GA, GB, VX and H were detected in all sample materials (soil, sand, water and protective clothing). As Lewisite is rapidly hydrolyzed in water, it could not be detected in the aqueous samples.

After exposure to the prevailing weather for 20 hours, three replicates of each of the spiked samples were washed with 50 ml water and passed through a combination of C_{18} cartridges (top) and NH_2 cartridges (bottom) using a hand operated vacuum system. The cartridges were pre-wetted with 1 ml methanol and 10 ml water before application of the samples. The cartridges were labelled, put in a sealed plastic bag and placed in a thermos flask of dry ice for transport to the laboratory. The rest of the spiked samples were transported untreated in closed containers back to the laboratory for further analyses; a military aircraft was used for the transport, and military regulations were followed. All relevant information on the samples and sample preparation was entered on the form previously described. One copy of the form was transported together with the samples, and one copy was retained by the sampling team. A transport log has further been drawn up to follow the samples during transportation. One log followed each parcel, and the date and time were entered by the personnel in charge of each stage of transportation from the sampling site to the destination. The maximum permissible temperature during transport was filled in by the sampling team for the benefit of the personnel in charge of transport.

A transport log is shown as an annex to this paper.

At the laboratory, the chemical compounds were eluted from the C_{18} and NH_2 cartridges and the eluates analyzed by gas chromatography. One portion of each of the untreated samples was also analyzed by headspace gas chromatography without pretreatment.

The results of the analyses of the spiked and weathered samples show that GA, GB, VX and H were found in all sample materials using the C_{18} sorbent extraction technique. The headspace method is not useful for low-volatile compounds like VX, but detected all the compounds except sarin (GB) in sand and tabun (GA) and mustard (H) in soil samples. Because lewisite (L) decomposes very rapidly in contact with water, this compound was not detected in any of the samples analyzed.

Laboratory experiments

When the samples are received at the laboratory after transport from the field, they are generally split into several sub-samples for analysis by several different methods. To be sure that the sub-samples contain equal amounts of the chemical compounds to be determined, it is important that the main samples are homogenized and split properly. A method of homogenization of solid samples before splitting into sub-samples has been developed using a shaking machine for dry samples and a mortar for wet samples. In these experiments, the sarin impurity diisopropyl methylphosphonate (DIPMP) was used as a model substance and added to sand, soil and glass spheres at several different concentrations. When the homogenized samples were split into ten equal sub-samples and analyzed, DIPMP was found in all samples with satisfactory standard deviations.

In addition, the organic solvents methanol, acetone, dichloromethane, tetrachloromethane, chloroform, isopropanol, diethyl ether, ethylacetate, hexane and the mixtures methanol:chloroform (1:1) and chloroform:diethyl ether (1:1) were tested to evaluate which one most efficiently extracts selected chemical warfare agents and related compounds from different sample materials. The chemical compounds tabun (GA), sarin (GB), soman (GD), VX, mustard gas (H), and methyl 1,2,2-trimethylpropyl methylphosphonate (MTMP) were tested on the materials sand, soil, paper and butyl rubber. This experiment showed that the highest recovery rates were obtained with the methanol/chloroform mixture. This mixture also showed the smallest variations (SD) among the sample materials. There were only small differences between the results obtained with other extraction solvents, except for hexane, which consistently gave the lowest extraction yields. One problem observed with the methanol/chloroform mixture was that phase separation occurred with some types of samples.

Conclusions from field experiment

To evaluate the complete verification procedure, including the usefulness of the sampling forms and transport log, an attack with chemical weapons on an air base was simulated. The sampling team used the chemical agent monitor (CAM) and detection paper to localize and define the contaminated area in about 30 minutes. The CAM proved especially useful for this purpose.

To allow correct conclusions to be drawn from the results of the sample analysis, it is extremely important to record information during location of a contaminated area, sample collection, sample preparation, field analysis and sample transport . A form has therefore been drawn up for use by the sampling team during the inspection. This should be completed with information about the reason for taking samples, a description of the sample site, sampling methods, weather conditions and results of the field analysis. If eyewitness accounts or other information on the chemical attack is available, this should be included, together with reports on the inspection of any casualties. One copy of the form should be sent to the laboratory together with the samples and one copy retained by the sampling team. A transport log has also been drawn up, and this should follow each parcel during transportation. The date and time should be entered in this log by personnel in charge of each section of the transport.

The field exercise showed that thin layer chromatography (TLC) can be used as a rapid method for screening samples of chemical warfare agents in the field close to the contaminated area. This method gives an initial indication of which chemical agent is present in the samples, and could make it easier to select the methods of sample preparation and analysis which give the most reliable results in the laboratory.

The analysis of the samples spiked with real chemical warfare agents showed that the sorbent extraction (C_{18}) method could detect all spiked agents in all sample materials. The greatest advantage of this method is that chemical warfare agents can be isolated from the sample materials in the field immediately after sample collection. This minimizes the loss of information due to decomposition and evaporation of the agents during transport to the laboratory. In addition, the sorbent extraction technique is easy to carry out and does not require large amounts of equipment and chemicals.

Conclusions from Laboratory experiments

It is important that the samples are properly homogenized before they are split into several sub-samples for analysis with different techniques. A method has been developed whereby dry samples such as sand are homogenized in a shaking machine for one minute before they are split into several sub-samples. Wet solid samples such as soil are homogenized in a mortar for three minutes. Using these methods, satisfactory standard deviations were obtained for the content of DIPMP in the sub-samples.

An evaluation of different solvents for extracting selected chemical warfare agents from the sample materials sand, soil, butyl rubber, and paper showed that a mixture of methanol (50%) and chloroform (50%) gave the highest extraction yields. A number of other solvents also gave high recovery rates.

SAMPLE DOCUMENTATION. SAMPLING.	Page 1 of 3
Items 1-11 refer to the sampling procedure.	
1. Name : Date : Time : Position:	
2. Reason for sampling :	
3. Sample priority : First	Second Third
4. Sample code number :	d
a	e
b	f
c	g
5. Description of sample :	d
a	e
b	f
c	g
6. Method of obtaining the sample(s) :	d
a	e
b	f
c	g
7. Results from field analysis (CAM, TLC) :	
8. Weather conditions :	
9. Description of sample site (topography, vegetation etc) :	
10. Location of sample site (map reference UTM) :	

SAMPLE DOCUMENTATION. SAMPLING. Page 2 of 3

11. Sketch of site , topography, bomb craters etc.
Use cross and sample code number to give sample site.
Please indicate North-South and wind direction.

SAMPLE DOCUMENTATION. ATTACK.	Page 3 of 3

Items 12-17 refer to observations concerning the attack.

12. Date : Time :

13. Weather conditions since the attack :

14. Symptoms of casualties (humans/animals) :

15. Effect on vegetation :

16. Description of the attack method of delivery, smell, sound etc)

17. Description of munitions found at the site :

18. Remarks :

TRANSPORT LOG.

1. Sampling carried out by : _____ _____

   Confirmed by : _____ _____

   Date : _____ Time : _____ Parcel number : _____

   Total number of parcels in shipment : _____

   Temp should not exceed : _____°C Description of parcel :

2. Transport and storage information.

Date and time received	Place received	Means of transport	Temperature during transport	Name and position

3. Received by _____

   Institution _____ Date : _____ Time : _____

CONFERENCE ON DISARMAMENT

CD/1079/Corr.1
11 November 1991

ENGLISH only

LETTER DATED 3 JUNE 1991 FROM THE REPRESENTATIVE OF FRANCE ADDRESSED TO THE PRESIDENT OF THE CONFERENCE ON DISARMAMENT TRANSMITTING THE TEXT OF THE ARMS CONTROL AND DISARMAMENT PLAN SUBMITTED BY FRANCE ON 3 JUNE 1991

Corrigendum

On page 3, the subtitle should read:

"II. REGIONAL OBJECTIVES"

GE.91-62735

CONFERENCE ON DISARMAMENT

CD/1079
3 June 1991

ENGLISH
Original: FRENCH

LETTER DATED 3 JUNE 1991 FROM THE REPRESENTATIVE OF FRANCE ADDRESSED TO THE PRESIDENT OF THE CONFERENCE ON DISARMAMENT TRANSMITTING THE TEXT OF THE ARMS CONTROL AND DISARMAMENT PLAN SUBMITTED BY FRANCE ON 3 JUNE 1991

I have the honour to send you herewith the text of the arms control and disarmament plan submitted by France on 3 June 1991.

I would be grateful if you would make the necessary arrangements to publish this text as an official document of the Conference on Disarmament and to ensure that it is circulated to all Member States and non-Member States participating in the work of the Conference.

(Signed) Gérard Errera

Ambassador
Representative of France
to the Conference on Disarmament

GE.91-61058/0356H

ARMS CONTROL AND DISARMAMENT PLAN

The spread of increasingly costly and destructive weapons systems is exposing the world to growing dangers. Inequalities, injustices and the imbalance of forces are conducive to threats, the arms race, and conflicts of all kinds. The proliferation of weapons of mass destruction gives a global dimension to these dangers. The whole world, South and North alike, has a vital interest in halting this race and in checking this dangerous and ruinous proliferation. This concerns us all.

Our aims are clear. Chemical weapons must be eliminated. Bacteriological weapons must not be produced. Existing nuclear arsenals must be reduced to the lowest level consistent with the maintenance of deterrence. The non-dissemination of nuclear weapons remains an imperative, whereas the use of nuclear energy for peaceful purposes is justified. The dissemination of ballistic technologies must be strictly controlled in so far as they may be used for aggressive aims. On the other hand, there is no reason to prevent cooperation in space for civilian and scientific purposes.

As regards the so-called conventional weapons, a balance of forces should be maintained, or introduced, everywhere, region by region, while respecting the right of all States to security. Arms exports are consequently to be strictly controlled and so conducted as not to contradict this action. France has already made these goals its own, and is prepared to subscribe to any improvement in existing arrangements, to any new international or multilateral commitment based on them. It has already started thinking about this issue with its partners in the European Community.

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Global arms control and disarmament presupposes action at three levels: the weapons category level, and the regional and worldwide levels.

I. CATEGORY OBJECTIVES

Each weapons category requires specific treatment, proceeding in stages if necessary. In order to achieve clearly-defined goals binding on all, France, which is constantly concerned to adapt its own regulation, proposes that concrete measures, sector by sector, should soon be taken.

1. **Prohibition and elimination of chemical weapons.** The entire international community, meeting in Paris in January 1989, acknowledged the need to complete the convention banning chemical weapons, as soon as possible. France proposed convening the Ad Hoc Committee on Chemical Weapons in Geneva at ministerial level to conclude the negotiations before the end of the year. It calls on all States to become parties to the Convention from the outset.

2. **Prohibition of bacteriological weapons.** At the Review Conference of the 1972 BW Convention in September of this year, France will propose the addition of a protocol on verification.

3. **Nuclear disarmament** remains an essential goal. France supports the efforts to reduce the nuclear arsenals of the two major Powers. It confirms that it will participate in the process as soon as the conditions it specified in 1983 have been fulfilled.

At the same time, it is important to prevent the proliferation of nuclear weapons beyond the present five nuclear Powers.

France, which is already applying all of the terms of the Non-Proliferation Treaty, has in principle taken the decision to sign it and hopes that all States will accede to it.

4. **The Missile Technology Control Régime** (MTCR), which allows those now in possession of missile know-how to limit the risks of ballistic proliferation, should only be a stage towards a more general agreement, one that is geographically more extensive, better controlled and applicable to all. The agreement would lay down rules promoting civilian cooperation in space, while removing the dangers of the diversion of technology for developing a military ballistic capability. Here again, the aim would be to arrive at a situation where all States wishing to gain access to space for development purposes would cooperate in a framework guaranteeing security.

France further recommends the development of outer-space confidence-building measures in the form of a "code of conduct" for civilian and military satellites.

5. **Conventional weapons.** Conventional weapons exports must not counteract the search, region by region, for a balance of forces at the lowest possible level consistent with the right of each State to security.

The five permanent members of the Security Council - which happen to be the principal producers of conventional weapons - are to start a round of concertation in the coming weeks aimed at determining rules of restraint. The process could then be broadened on the occasion of the next session of the General Assembly, with a view to establishing an international register of arms sales to be kept by the Secretary-General of the United Nations. Particular attention will be given, in the course of these discussions, to sales of conventional weapons in parallel markets.

The members of the European Community have already begun a process of concertation aimed at making proposals on this subject.

II. OBJECTIVES

The example of Europe is encouraging. The Europeans have moved on from the cold war to peaceful coexistence, and now to cooperation within the framework of the Conference on Security and Cooperation in Europe (CSCE). They have adopted and applied security and confidence-building measures. They have signed the first disarmament agreement concerning conventional weapons. This experience cannot be transposed as such. But it does show that the arms race is not inevitable. This approach could serve as an inspiration for other initiatives in other regions.

We call for **regional security arrangements** based on the following rules:

(a) Only when the solution of conflicts is started, can this process get underway and confidence be created.

(b) Adoption by the parties concerned of **regional confidence-building and security measures.** Information is the prime condition of confidence. Transparency and confidence-building measures, i.e. mutual information on force capabilities and strengths, and on the movements of armed forces, reduce the sense of threat and paves the way for disarmament proper. For that, a framework is needed, which may be a regional organization, and means of inspection in situ and by satellite. France would be willing to disclose information available to it to **regional agencies responsible for transparency.** It would favour the transmission to such regional agencies of the means of observation, in particular those in outer space that as may be available to Europe and the United Nations.

(c) Efforts must be made, through national decisions and through negotiations, to move towards **a balance of regional forces.** Arms export policies must not run counter to this goal. Once this equilibrium has been attained, its level should progressively be lowered through negotiations providing for means of control.

(d) **Strict regional application of the category régimes laid down for nuclear, bacteriological and chemical (NBC) weapons and ballistic missiles.** That is why, at the initiative of France, United Nations Security Council resolution 687 on the cease-fire in the Gulf conflict noted that the specific constraints imposed on Iraq as regards nuclear, chemical and biological weapons, as well as ballistic missiles, represented steps towards the goal of establishing in the Middle East a zone free from weapons of mass destruction and all missiles, along with a global ban on chemical weapons. That goal should be pursued in other regions of the world.

III. The United Nations is now in a position to fully play the role it was assigned by its Charter. France considers that it is therefore for the **Security Council** to guarantee and, if necessary, to harmonize these disarmament and non-proliferation policies. The Council must encourage the signature of agreements on particular arms categories, as well as regional and multilateral disarmament and non-proliferation agreements. From the agreements reached, it would derive general rules and thus exercise a function of worldwide vigilance.

This presupposes that the members of the Security Council and in the first place its permanent members will set the example.

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CONFERENCE ON DISARMAMENT

CD/1080
CD/CW/WP.341
5 June 1991

Original: ENGLISH

UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND

VERIFICATION OF THE CHEMICAL WEAPONS CONVENTION: PRACTICE CHALLENGE INSPECTIONS AT CIVIL CHEMICAL PLANTS

Introduction

1. In CD921 and CD1012 the United Kingdom presented the results of its practice challenge inspection programme at government facilities. Our key conclusion was that there was no site so sensitive that we could not allow some form of access within the site, albeit rigorously managed. We subsequently decided to examine whether the lessons learned during the government programme were also relevant to inspections at civil chemical plants. One of the key issues we wished to examine was how to protect commercial confidentiality whilst still providing sufficient access for the inspectors. Accordingly one full practice challenge inspection at a large multi-purpose batch plant and a follow-up visit to a separate smaller dedicated plant were held in January and April this year. The follow-up visit was used to explore in detail some of the key lessons identified during the practice inspection. This visit reinforced many of the principal conclusions drawn in the full inspection.

Aims and Objectives

2. The inspection and follow-up visit had two major objectives:

(i) to test the effectiveness of challenge inspection at chemical plants, especially at large multi-purpose facilities.

(ii) to see whether sufficient access within the plant and to documentation could be given to demonstrate compliance without seriously compromising commercial confidentiality.

Conduct of the Exercise and Major Lessons

3. The first inspection involved an inspection team of 5 inspectors; a sampling team of 3; a receiving team of 9, including both government and company personnel; 2 control staff and one observer. For the purposes of the trial, it was agreed in advance to limit the inspection to one production area only within the large multi-purpose facility. This still provided a representative indication of the problems likely to be encountered in a real inspection, and contained sufficient interest to sustain two days of inspection. The follow-up visit focussed in greater depth on the scope for using a dedicated plant to make alternative products, the scope for diverting production, and examination of production, health, and safety records.

4. The civil inspection exercise reinforced many of the organisational and practical lessons learned during the government practice challenge inspection programme: for example, the importance of relevant expertise in both inspection and receiving teams; the requirement for well worked out sampling procedures and the need for clear rules for the challenging state observer (CSO). In the course of the inspection several valuable lessons were learned about the handling of challenge inspections at civil chemical plants. These can be summarised under the following headings: compliance assessment; records; commercial confidentiality; sampling practicalities; government expertise; and financial aspects. These issues are discussed in fuller detail below.

Compliance Assessment

5. From the inspectors' point of view, a challenge inspection at a chemical plant can present a more difficult task than at a military facility for the simple reason that the inspectors are "surrounded by chemistry". Inspectors therefore need to ensure particular precision in gathering information on chemicals present at the site, and this may require a more detailed analysis of the plant's activities to provide sufficient confidence in compliance.

6. If the request for an inspection does not give precise details of the compliance concern, the inspection team would have to rely on their own judgement in testing for particular Schedule 1 chemicals or other potential or known CW agents. In general an inspector's tasks might include the following:

- check for evidence of the presence of Schedule 1 chemicals on site shortly before the inspection;

- check that there are no chemicals on the site at the time of the inspection which are in contravention of the CWC, or inconsistent with declarations;

- check that any chemicals with CW potential are in fact being used for legitimate purposes and are not being diverted;

- look for evidence of possible violations in the recent past.

7. If a plant was designed with nerve agent production in mind, and was readily adaptable, this would probably be picked up quite easily by the inspectors, particularly if key precursors were present on site. Other CW agent production might be harder to detect. The inspection team would need to include at least one chemical process engineer familiar with requirements for classical CW agent production. Inspectors would also need to be aware of possible requirements for production of "novel agents". The inspectors could then target their efforts accordingly. A precise specification of the compliance concern in the inspection request eg "believe production of GB or GF occurring in..." would considerably facilitate inspection and analytical tasks, particularly at large complex chemical plants. It would also reduce the risks to commercial confidentiality since a less intrusive inspection may be required to satisfy the particular compliance concern in such circumstances.

8. The inspectors would have required a full 7 days to undertake an effective inspection of the whole of the large and complex chemical site which was the subject of the first UK trial. Despite potential practical and evidential difficulties we concluded that an inspection would have an important deterrent value. The inspected State would not know exactly which plant, and in what sort of detail, the inspectors would chose to examine over the 7 day period. Nor, moreover, could the challenged State be confident that all traces of potentially incriminating evidence could be completely removed.

Records

9. At the UK exercises, the inspectors did not, overall, find commercial confidentiality requirements a major obstacle to their assessment of the site's activities. The only problem of note they encountered concerned the analysis of records for a particular Schedule 3 chemical where the receiving team were initially prepared to offer only documentation from computer records to show inspectors that all materials were used as stated. This was regarded by the inspectors as of limited value in building confidence. Computer printouts, especially when produced in a location physically separate from the actual production line, do not have sufficient verisimilitude to provide convincing evidence. Sight of original hand-written records and invoices for the delivery of relevant chemicals would add considerably to the credibility of computer records. In the case mentioned above it proved possible to demonstrate a plausible internal consistency for randomly selected month, week and batch numbers, having been given some information on the raw materials for the product in question.

10. The effort involved in maintaining a second, false, set of records consistent with the scale of operations on site and internally consistent throughout would be considerable. Diversion of small percentages of chemicals could, however, be hidden within apparently legitimate mass balances. This suggests that using record analysis to verify such consistency, rather than for determining mass balances, may be a more effective use of inspection time and play a valuable role in verifying compliance at a chemical plant. To this end, the inspectors should consider examining laboratory quality control, maintenance, health and safety records, as well as production records. Some familiarity with industrial record keeping systems among the inspection team would obviously be helpful here. Access to sections of the overall records for periods in time selected by the inspection team would limit the amount of commercially sensitive information that needed to be divulged. But the ability to authenticate particular records by cross-checking throughout can provide greater confidence to the inspection team. The more transparent individual companies can be, the easier it is to demonstrate that all activities are indeed legitimate.

Commercial Confidentiality

11. Some attention has already been given in the negotiations to the question of protecting legitimate commercial secrets in the development of the Annex on the Protection of Confidential Information. In practice, as was evident in the UK exercises, private companies will naturally remain concerned not to reveal, even to the inspection team, any more confidential information than is necessary for the purposes of the inspection. They may be particularly concerned at the steady accumulation of information during the course of an inspection. Uncertainty on

the part of individuals at a plant as to how much information to reveal could lead to over-caution in responding to inspectors' questions. One way to address this problem might be for one or possibly a small core team of senior plant representatives to accompany the inspection team so that all questions and answers can be channelled through them. Individual companies might also consider preparing a general guidance note for all their manufacturing sites so that they can prepare, if necessary, relevant outline plans for receiving an inspection. Where there are particular concerns, companies could identify beforehand, as far as practicable, the most sensitive information and processes which they would prefer to protect, and consider how they would provide reassurance to inspectors if pressed on these points. Such plans might need to be updated from time to time to take account of any changes that may occur at the site. In practice general guidance may be all that is feasible or indeed necessary.

Sampling

12. Not surprisingly, sampling at the chemical plants proved to be a more complex activity than at our previous inspections at non-chemical sites. Industrial safety procedures for sampling hazardous materials were extremely stringent and required proper certification and the use of trained site personnel. In addition modern chemical plants may have long complicated pipe runs and not be readily susceptible to sampling at multiple points. In the first UK exercise the inspection team used process flow charts to follow through the production line of one product in order to identify the optimum sampling locations to verify that production was as claimed and that no controlled

chemicals were present. The company was particularly concerned about two of the chosen locations, fearing that detailed analysis would reveal sensitive data eg knowledge of reaction components which, if leaked, could provide competitors with details of reaction mechanisms. The inspection team overcame this problem by allowing the company to perform analysis in its own laboratories under their close supervision.

13. Since many classical CW agents contain phosphorus and sulphur, gas cromatography with flame photometric detection could be used. Alternatively, the use of Neutron Activation Analysis could be employed by the inspectors themselves. Both techniques could probably provide sufficient information to satisfy the inspectors without having to divulge commercial secrets. The method of element specific analysis, although widely applicable, may not work in every case, but the principle of negotiating restricted analytical methods can provide a valid approach to dealing with confidentiality concerns and might in some cases avoid the need for off-site analysis. In the UK exercise the company was able to find a way of satisfying the inspectors while keeping commercially sensitive information secret.

14. Six main conclusions were drawn on the practical aspects of sampling at chemical plants. These were:

- internationally acceptable safety certificates determining the intrinsic safety of electrical equipment would simplify and expedite home team clearance of approved items;

- inclusion in inspection teams and sampling teams of personnel fully conversant with the safety equipment (eg CCBA suits) necessary to enter particular plants would reduce or even preclude the need for in situ training and avoid opportunities for obstruction and delay on the part of the home team. This might require international agreement on universal standards;

- availability of process flow diagrams would allow sampling to be more specific and so reduce the numbers of samples that need to be taken;

- instruments, such as gravity meters, to assist in detecting underground systems would be useful;

- additional aids to sampling such as long handled dippers, extending vapour samplers etc (for vent sampling) would make the process easier at many locations within a chemical plant;

- sampling can be time-consuming and requires a team of at least 3 members for the task to be performed effectively and efficiently.

Financial Aspects

15. The direct costs of the inspection in terms of the provision of facilities were relatively minor, although there were additional resource implications in the involvement of company personnel. The key financial concern from the company's point of view is to ensure that their production and delivery schedule is not adversely affected since this can have potentially damaging economic consequences. As in the case of

IAEA safeguards, it needs to be stressed that inspection activities should not unduly interfere with legitimate production at civil chemical plants. At the same time it will be in the company's interests to be ready to propose ways of addressing the inspectors' concerns which minimise the impact on their legitimate activities eg sampling from adjacent areas, process flow diagrams, access to plant control instrumentation, waste outflows or treatment plants, feed stocks and filling points. Similarly, to enable the challenged site to be secured during the inspection whilst allowing legitimate activities to continue, the inspection team could allow traffic to move in and out of the site but subject it to random checking. This would give confidence that no CW-related material is being removed whilst not disrupting manufacturing and delivery schedules.

Government Expertise

16. Our practice challenge inspection programme at government facilities demonstrated the importance of government providing technical and policy advice and guidance for each challenged facility. Our recent trials showed this to be true also for civil chemical plants. We would envisage having a senior policy or military official to lead the home team and be the main point of contact with the inspectors rather than placing this burden on a site superintendant or plant manager. A national implementation committee might also be necessary to provide extra personnel and administrative support for escort duties and transport to reduce the burden placed on individual companies. Government expertise and advice on handling challenge inspections would need to be made generally available to the civil chemical industry. Chemical firms might wish to consider training designated personnel in the management and conduct of inspections. Practical experience gained from trial inspections should prove very valuable in preparing implementation procedures, particularly at sensitive sites.

Conclusions

17. Although the civil inspection programme was not as extensive as the trials at government facilities, the combination of a full practice challenge inspection at a large complex chemical plant and a follow-up visit to a smaller dedicated facility provided a useful insight into some specific aspects of handling challenge inspections at civil chemical sites and enabled some valuable lessons to be drawn. Our main conclusions were as follows:

(i) Concerns Over Commercial Confidentiality

The need to protect legitimate commercial confidentiality can be reconciled with an inspection team's requirements for extensive access. The duty of an inspection team not to interfere unreasonably with the legitimate work of a company should be spelt out in greater detail in the Inspection Protocol. If a stoppage of production is requested, companies should be ready to explain their difficulties and suggest how these might be overcome.

The chemical complexity of some sites and the size of some companies may make it difficult for companies to prepare thoroughly in advance for a possible inspection, but companies may find it useful to provide general guidance to their staff and to select local staff to receive and accompany any inspection team. Help in preparing for and receiving an inspection should be available from a government team of experts.

(ii) Sampling

The inspectors will need to be accompanied by a full team of properly trained and well equipped experts to carry out sampling. A system of international safety clearances, which the samplers would need to satisfy, would avoid repetition of safety training at each site. Element specific analysis and giving companies the opportunity to carry out analysis of samples themselves where possible, under the guidance of the inspectors, would help to protect confidentiality.

(iii) Detection of Non-Compliance

Although breach of the Convention might be more difficult to detect at a chemical site than at a military site, a wide ranging inspection based on examination of plant equipment and checking of records would present a significant risk of discovery to an evader.

CONFERENCE ON DISARMAMENT

CD/1081
CD/NTB/WP.13
11 June 1991

Original: ENGLISH

AUSTRALIA AND NEW ZEALAND

VERIFICATION OF A COMPREHENSIVE TEST BAN

Summary

New Zealand and Australia share a common commitment to the achievement of a comprehensive ban on nuclear testing. The resolution submitted jointly by Australia and New Zealand to last year's General Assembly emphasises that:

> "An end to nuclear testing by all states in all environments for all time is an essential step in order to prevent the qualitative improvement and development of nuclear weapons and their further proliferation, and to contribute, along with other concurrent efforts to reduce nuclear arms, to the eventual elimination of nuclear weapons".

2 Despite overwhelming endorsement in the United Nations of the call for the early achievement of a CTB, there has been little substantive progress towards this goal. New Zealand and Australia share the sense of frustration felt by many countries that the major achievements of recent years in disarmament and arms control have not been matched by comparable progress on a nuclear test ban. The two countries saw the Partial Test Ban Treaty Amendment Conference as a good opportunity to discuss in depth ways of furthering the objective of a CTBT, particularly on the important issue of verification. This paper was originally submitted jointly to the Conference as a positive and constructive contribution to its discussions.

3 The achievement of an effective CTBT is of course a global concern, and the need for verification clearly is not confined to the existing nuclear weapons states. New Zealand and Australia firmly believe that a CTBT has an essential role in preventing the horizontal and vertical proliferation of nuclear weapons. The achievement of a verifiable nuclear test ban would considerably strengthen the non-proliferation regime based on the NPT, IAEA safeguards and nuclear free zones.

Verification Requirements

4 One fundamental argument that has been put forward against a CTBT is that a nuclear test ban would not be verifiable. The Governments of Australia and New Zealand do not accept this view. Substantial scientific evidence is now available establishing the feasibility of verifying a nuclear test ban, particularly through seismic monitoring. It is technically possible to detect underground nuclear tests with a high degree of confidence down to very low levels.

5 In the view of New Zealand and Australia the development of an effective verification mechanism is an important part of the process of creating an effective, widely supported, and verifiable CTBT. Effective verification is however only part of the whole process which will need to involve a political will on the part of a number of key players before it can be achieved. In the meantime we see great value in taking as far as we can the development of an effective verification mechanism.

Seismic Verification Techniques

6 The two countries consider that the work carried out within the Conference on Disarmament by the ad hoc Group of Scientific Experts (GSE) is of fundamental importance in demonstrating that technical means exist for the verification of a CTBT.

7 The first report of the ad hoc group in 1978 (CCD/558) presented the results of a study of the detection ability of a hypothetical global network (Network III (SRO)) of digital broad-band seismographs located at then existing seismograph stations. It was estimated that this network (of at least two sections) would have a 90 per cent chance of detecting an event of magnitude 3.8 to 4.2 (or greater) in the northern hemisphere and magnitude 4.0 to 4.6 (or greater) in the southern hemisphere. Magnitude 4.0 corresponds to an explosion of less than ten kilotons in most geological environments and much less than this level in some environments.

8 The third report of the group (CD/448) in 1984 pointed to significant developments in seismic instrumentation, including the installation of more seismic arrays. Since that date, there have been still greater improvements, particularly in response to the initiatives of the ad hoc group. While further study is needed to evaluate accurately the capability of the present global network, it is clearly very close to that projected in 1978, and may well be significantly better.

GSETT-2

9 New Zealand and Australia both strongly support, and are participating in, the second technical test on the global exchange and analysis of seismic data being conducted by the group (GSETT-2). Phase 3 of this test involving world wide data exchanges for a period of 42 consecutive days has just concluded. The two countries have contributed data from monitoring stations in Australia and New Zealand, and also from stations as far apart as the Cook Islands and Antarctica. All together, this seismic monitoring system covers a major part of the southern hemisphere, and represents an essential component in the global scope of the experiment.

10 Detailed evaluation of the test, which will take place in Phase 4 and be presented in the group's report, will be needed to assess the extent to which global seismicity has been monitored. However, it is already clear that from an operational point of view the test has been very successful. Modern communications systems have provided efficient means of data transmission from stations to international centres. At these centres, large computing facilities accomplished the huge task of assembling the mass of data pouring in from the network, and daily bulletins incorporating such data have generally been available within seven days. Requests from individual states for data to assist their national verification studies were responded to promptly by the centres. It is clear that the global system established for GSETT could well provide the basis for an effective system under a comprehensive test ban treaty.

11 Both New Zealand and Australia have recently upgraded their seismic monitoring and data transmission equipment as a further part of their contribution to GSETT-2. Australia acted as one of the four international data centres for this experiment. The seismic arrays operated by Australia have the facility for enhancing weak signals by data processing techniques, which makes a major contribution to the global network's detection ability, particularly in the southern hemisphere.

12 The two countries were well placed to contribute to the experiment because of their extensive experience in using seismic detection to monitor nuclear tests. Both New Zealand and Australia have for many years been closely monitoring France's nuclear testing programme at Mururoa Atoll in the South Pacific. Scientists in New Zealand and Australia have accordingly developed considerable practical expertise in the seismic monitoring of underground nuclear tests of varying magnitude.

13 New Zealand's monitoring of explosions in French Polynesia, using a seismograph station in the Cook Islands, has demonstrated the particular sensitivity of such stations to tests in oceanic areas. This would be an important factor in a global monitoring network.

14 Based on this collective experience, it is the considered view of the Australian and New Zealand Governments that seismic monitoring offers a reliable means of verifying a CTBT. The successful conclusion of GSETT-2 will further strengthen confidence in the effectiveness of a global seismic monitoring and data transmission system down to a very low level.

Evasion

15 The possibility of evasion has been put forward as a reason to doubt that a CTBT could be adequately monitored. Various technical scenarios have been put forward for ways in which countries might evade detection, primarily through 'decoupled' explosions in underground cavities. However, the technology to attempt such evasion is unlikely to be available outside the existing nuclear weapons states, and the risk of detection would be extremely high and would increase with each test.

16 With in-country networks of seismographs to enhance the detection capability of the global network, it is likely that even the most elaborate precautions would not prevent the detection of explosions at levels as low as 1 kiloton. Attempts to evade a nuclear test ban would therefore be confined to a level at which the military advantages to be gained from clandestine explosions would be minimal and the chances of escaping detection would be extremely low.

Other Verification Techniques

17 While seismic detection would be a vital factor in the monitoring of a CTBT, verification need not depend on this alone. A network for monitoring airborne radiation, as proposed by Sweden, would provide valuable collateral support to a global seismic monitoring network. Satellite surveillance data would also help confirm international adherence to a CTBT.

18 A recent development has been the increased acceptance of on-site verification in other areas of arms control, following the precedent first established by the

INF Treaty. This could also be extended to verification of a nuclear test ban. The ratification of the protocols to the Threshold Test Ban Treaty and the Peaceful Nuclear Explosions Treaty has now set a further example for cooperation on verification procedures.

19 On-site verification, which is already widely accepted as an important component of arms control agreements, might also provide further assurance of compliance with a CTBT. The international disarmament process has advanced dramatically since the seismic monitoring network was first proposed, when national technical means were considered the only effective means of verifying compliance. Cooperation on measures for on-site verification, such as the placement of seismometers at possible test sites, would strongly reinforce a teleseismic verification system.

Wider Participation in Seismic Cooperation

20 In order to develop a global seismic monitoring capability down to a very low level it will be necessary to improve the coverage of seismic stations in Africa, South America and Antarctica. The involvement is therefore necessary of a wider group than is currently involved in the group of scientific experts (GSE) in the Conference on Disarmament.

Conclusions

21 In summary, New Zealand and Australia consider that there already exists compelling scientific evidence that a nuclear test ban is verifiable using technology currently available. The ongoing work of the Group of Scientific Experts is providing substantial technical corroboration for that view. The argument advanced by some nuclear testing states, that a nuclear test ban is not possible because it could not be verified, has consequently become increasingly difficult to sustain.

22 New Zealand and Australia consider that considerable progress has already been made towards the development of an adequate mechanism to verify a nuclear test ban. The ongoing work of the Group of Scientific Experts is important in this respect and it needs to continue its work with the benefit of a wider membership.

23 New Zealand and Australia welcomed the constructive discussion of verification issues at the Partial Test Ban Treaty Amendment Conference. The two countries had suggested that a significant achievement for the conference would be to:

- recognise the progress made towards a fully effective international verification system;

- endorse the efforts of the Group of Scientific Experts to demonstrate the technical feasibility of such a regime;

- call on more states to participate in the GSE to improve in particular coverage of seismic stations in Africa, South America, and Antarctica.

The widespread support for these general principles was encouraging. New Zealand and Australia believe that as a result of the discussions in New York there is greater international commitment to the important work on verification being carried out by the Group of Scientific Experts under the auspices of the Conference on Disarmament.

CONFERENCE ON DISARMAMENT

CD/1082
CD/CW/WP.344
12 June 1991

ENGLISH
Original: SPANISH

SPAIN

REPORT ON A NATIONAL TRIAL INSPECTION IN THE CIVIL CHEMICAL INDUSTRY

INTRODUCTION

The Spanish Government has repeatedly emphasized its resolve to give firm support to a convention banning chemical weapons which will be effective and consequently verifiable.

In that context, and with the aim of bringing its own experience to bear on the negotiations and the objectives of the convention, Spain carried out an inspection of a plant producing a range of products, in which a schedule 3 chemical is produced by industrial chemical processes.

The inspection procedures applied were those stipulated in the text of the draft convention for schedule 2 chemicals.

The data obtained from the national trial inspection are presented in accordance with the now standard model set out in document CD/CW/WP.213.

A. GENERAL APPROACH

1. Objectives of the national trial inspection

The national trial inspection had the following objectives:

To assess the difficulties arising in practical application of the procedures laid down for verification of chemical industry producing schedule 2 chemicals;

To assess the relations between inspection of the chemical and industrial aspects of the plant and inspection of the accounts (auditing), using documents supplied by the management.

The trial inspection also had the following indirect objectives:

To provide direct information and experience to one of the seven major chemical plants in Spain, which, like all the others, will be affected by the provisions of the chemical weapons convention;

To provide direct information and experience to agencies in the Spanish administration which in the future will also be involved in tasks related to the application of the chemical weapons convention, both from the viewpoint of internal policy (new laws and regulations) and from the viewpoint of relations with the bodies to be set up under the convention (national authority, experts working for the organization, and so on).

The experience acquired proved particularly useful for a country like Spain, which has a large chemical industry with a medium-to-high level of technological development and a substantial export capacity.

2. Provisions in the draft convention under which the trial inspection took place

The inspection was conducted in accordance with the rules laid down for verification and monitoring of schedule 2 chemicals appearing in annex 2 of article VI. Despite the fact that the inspected plant does not produce schedule 2 chemicals, it was selected because its major features are very similar to those which would have to be declared under annex 2 of article VI.

3. Type of on-site inspection

The national trial inspection involved an initial, general inspection of the plant for familiarization purposes, followed by a routine on-site inspection.

4. Advance information

(a) Declarations

The plant management provided the inspectors with a detailed declaration in accordance with the format set out in annex 2 of article VI.

(b) Agreement on inspection procedures

The inspection programme was drawn up at a meeting held by the inspectors with representatives of the company one week before the inspection took place.

5. Type of facility inspected

The inspected plant corresponded to a declared multipurpose facility whose principal product is basic monomers for plastics production.

6. Type of declared activity at the facility

The plant produces no chemicals listed in schedule 2 of the draft convention text. However, it does produce a chemical on schedule 3, which, for the purposes of the inspection, was considered to be one of those included in schedule 2.

The plant consists of three clearly separate parts:

In the first, two conventional feedstocks A and B react over a catalyst in a fluidized bed to produce chemical C, the principal product of the reaction, and as a by-product chemical D, which was the principal subject of the inspection.

As is normal with organic chemistry reactions, a number of waste products are also produced which are not commercially usable and which are subsequently sent with others for destruction by incineration in a purpose-built unit within the plant itself.

The reaction liquid is subject to a process of separation by distillation as a result of which chemical C, following purification, is ready for sale.

Chemical D is used primarily to produce a further chemical E, an intermediate product normally traded in the chemical industry.

Another portion of chemical D, which was the subject of the inspection, is made into an aqueous solution which is transported by rail to an organic chemical plant elsewhere in Spain.

This is the real crux of the inspection, since at this point chemical D has not been processed by the producer. However, the inspection team noted that for security and environmental reasons, the competent authorities at the time had not authorized the installation of intermediate tanks, so that there is no more chemical in the plant than that found in the container in which the solution is prepared, and that, once it is full, this container is pumped out into a tank wagon for transport to its destination.

Subsequent visual inspection confirmed that the facility contains no equipment for the compression, liquefaction, packaging or transport of this chemical in another form.

7. Actual activity at the facility

Throughout the inspection it was found that the actual activities at the facility were as declared.

B. DETAILED APPROACH

1. The inspection agreement

The management of the company and the inspection team negotiated a very broad inspection agreement under which there were no restrictions on access to any part of the plant. The agreement was drawn up on the basis of the document set out in CD/1033.

2. The inspection team was made up of the following:

Team leader: A chemical industry manager with extensive experience in industrial processes;

A chemical plant manager who is an expert in processes, with special reference to security and environmental factors;

A weapons specialist representing the Ministry of Defence;

A chemical warfare specialist representing the Ministry of Defence;

An expert in commercial and balance-sheet auditing;

Two representatives of the Ministry of Foreign Affairs, performing functions which will in future be allocated to the national authority.

The inspectors were accompanied by a representative of the company that owns the facility visited.

3. Inspection equipment

During the inspection, in compliance with applicable regulations, use was made of protective security equipment supplied by the company itself. Equipment for sample-taking and analysis was also supplied by the company and used on the spot.

4. Activities prior to the arrival of the inspection team

The plant management was given one week's notice of the exact date of the inspection.

5. Advance preparation on-site

The only preparations carried out on-site were those immediately connected with the work of the inspection team. Consequently, the plant made no changes in its normal procedures in advance of the inspectors' visit.

6. Preparations relating to escort and points of contact

The inspectors were accompanied by staff of the company which owned the facility, starting from a point of contact decided upon by the company itself.

7. Other participants

There were no other participants.

8. Duration of inspection

The inspection took three days in all. On the first day the first contact was made with plant representatives and the confidentiality agreement was signed. On the second day the inspection team split into two groups; the scientific/chemical group began the detailed inspection of the plant after receiving precise information from the technical department.

The accounting expert visited the accounting department and began his study of the documentation supplied by the company.

The inspection team devoted the third day to drafting its report on the basis of the information obtained by the two groups of inspectors in their fields of competence.

9. Measures to protect confidential information

Prior to any activities related to the inspection, the plant management required all the members of the team to sign a confidentiality agreement in which they undertook not to use the information obtained as a result of the exercise for purposes unrelated to the inspection.

This undertaking is binding unless waived by the company itself.

10. Opening conference

During the opening conference, company representatives elaborated in detail on the preliminary information provided one week before and explained the safety regulations that would have to be complied with in the course of the inspection.

The company's Processes Department presented production data for the previous two years, the flow chart and the manufacturing process for the product under investigation.

11. Types of records needed and/or audited

One member of the inspection team devoted himself to the authoritative verification, on the basis of the commercial documentation on inputs and outputs, of the data and flow charts supplied. It should be noted that this company's operations are audited by firms of recognized international competence.

The firm's balance sheets at the beginning and end of the past few years were examined with respect to stocks of those products used in the production processes of the units examined.

By means of the relevant company documents, production for these years was studied and checked, together with other inputs from units other than those involved in the process in question.

The records of intermediate products dispatched to other units, internal consumption and commercial sales were then examined.

On completion, these balances for the whole production process were compared with the figures obtained by applying efficiency factors to each unit in the light of the relevant levels of use; it was found that the recorded and calculated product balances matched perfectly.

After these products had been matched, the team used random sampling methods to analyse invoices and records of purchases of raw materials, transfers of intermediate products and sales of commercial products.

Lastly, the team checked all the supporting documents relating to sales of the product with which the inspection was directly and specifically concerned, and found that they were in complete conformity with the sales data provided by the company in its product balance.

Full monitoring of product D could, if necessary, be achieved by comparing shipping documentation with the acceptance documentation of the receiving company, and comparing both sets of documentation with that of the Spanish National Railways, since products of this type are carried exclusively by rail.

12. Plant orientation tour

After the analysis of the plant's characteristics and flows, and of all the information made available by the management after the opening conference, the team made a visual inspection of the plant which from the outset confirmed the data it had already received.

13. Inspection of areas and facility equipment

The following areas and facility equipment were inspected in detail:

Reaction area;

Repairs area;

Purification area;

Distillation area;

Storage area;

Laboratories, sample-taking processes and analytical equipment.

14. Inspection of operation procedures

In the course of the inspection, special attention was paid to those procedures used in the production of the chemical under inspection in which diversion to the manufacture of schedule 1 substances might occur.

15. Sampling and sample-taking procedures

Sampling at the various stages of the production process and sampling from waste were undertaken by company personnel using company equipment whenever and wherever the inspectors so requested.

16. Handling of samples

The samples were always taken under the direct supervision of the inspectors, and the sample containers were identified by the inspectors, in order to safeguard subsequent handling.

17. Analysis of samples

The samples obtained throughout the production process under the supervision of the inspectors were immediately analysed in the plant laboratory, again under direct supervision by the inspectors. The laboratory log-books recording the systematic analyses of the aqueous solution of substance D were also examined and were found to conform to the analyses made by the company's clients who had received the substance.

18. Types of analyses

The analyses were carried out in conformity with ASTM standards.

19. Documentation of the inspection

The inspectors kept records of the samples taken throughout the production process and of the results of the analyses carried out immediately afterwards in the plant's own laboratory.

It was not considered necessary to remove any documentation from the plant.

20. Evaluation by inspectors

The evaluation undertaken by the inspectors took into account:

The complete documentation provided by the company as regards technical accounting data;

The possibilities of detecting anomalies in the course of the production process;

Consistency between inspection of the production plant and the accounting data supplied;

The firm's willingness to cooperate with the inspectors.

21. Closing conference

No conference was necessary on completion of the inspection team's activities.

22. Anomalies, disputes and complications

None.

23. Report of the inspection team

The report on the inspection was prepared in the course of a meeting held immediately after the inspection and was drafted by one of the team members during the days following that meeting. It comprises the following sections:

Preparations for the inspection: prior contacts and conversations;

Analysis of the confidentiality agreement;

List of inspection activities undertaken at the plant;

Analysis of accounting and commercial documents provided by the company;

Results and verification of analyses and analytical systems;

General evaluation and conclusions by the inspectors.

24. Impact of the inspection on facility operations

The chemical industrial and accounting aspects of the trial inspection caused no disruption of the plant's production process.

Nevertheless, the inspection did directly entail expenditure for the company in the form of loss of working hours by staff and travel by some of its executive staff both during the preparatory period and during the inspection itself.

C. CONCLUSIONS

1. The inspection mandate

The inspection mandate was sufficiently broad to enable the inspection team to do its work effectively. The work was effective in that it enabled reasonable certainty to be achieved concerning the plant's activities. The company denied the team access only to the computerized data bank in which the plant's production processes are stored. Apart from this type of information, which lies at the heart of the company's legitimate right to confidentiality concerning its technological and commercial research, the inspectors had free access to all departments.

2. Composition of the inspection team

Inspection of a multi-purpose plant of the kind with which we are concerned requires a large inspection team, as experience has shown. The inspection team must comprise experts in chemical engineering, chemical analysis and commercial and balance-sheet auditing. This obviously entails costs which will probably in some way devolve upon the chemical industry

inspection systems that are eventually adopted under the chemical weapons convention. Moreover, and in contrast to the experience of other countries, after trial inspections such as this it does not seem that a smaller plant can be inspected by a smaller team of inspectors. Because of the complexity of current industrial processes, for the purposes of in-depth analysis a high and specialized degree of technical expertise is required, whether the plant be large or small.

It was also found that the work of the accountants as team members was fundamental. As in the case of other countries, the Spanish experience has shown that the modern industrial chemical process generates a large quantity of records, the analysis of which is of great benefit to the inspectors in their work. Moreover, in the majority of cases, this analysis does not involve serious interference in the company's privacy (raw material inputs, movements of substances within the plant, etc.).

3. Analysis and taking of samples

The systems used for the taking of samples and immediate analysis of the samples obtained whenever and wherever the inspectors so requested enabled them to ascertain to their full satisfaction the legitimacy of the plant's activities. It is, however, more than likely that on many occasions, for purely technical reasons, it will be necessary to take more samples and to subject them to comparative analysis within and outside the plant, using procedures that are much more stringent and are clearly separate from the channels, procedures, facilities and even personnel of the plant.

4. Duration of the inspection

In the opinion of the team of inspectors, the time taken up by the inspection (three days on-site, plus a preliminary meeting one week before) represents a realistic estimate of the possible duration of an actual inspection in the future.

5. Measures to protect confidential information

From the outset of its contacts with the inspection team, the company expressed its concern about confidentiality. Consequently, all members of the team were required to sign a document in which they undertook not to divulge any of the data obtained in connection with their activities. It was not considered feasible to draw a distinction between confidential and non-confidential data.

6. General assessment

The inspectors realized the importance of good cooperation on the part of the company, both in the preparation and in the conduct of the inspection. They also concluded that no firm whose activities are legitimate would be likely to have a serious objection to supplying the inspectors with exhaustive documentation on technical data relating to the facility, production charts, efficiency levels and analytical methods.

The inspection team also realized the enormous importance of visual inspection - both prior overall inspection and subsequent detailed inspection. Through careful visual inspection unrestricted by the company, an expert can already obtain important information.

Lastly, it was found that commercial auditing, especially in those companies in which the documentation used conforms to examinations by internationally recognized external auditing firms, is vital and ensures reliable checking of figures and activities. The use of this instrument for this type of verification is accordingly considered highly advisable.

CONFERENCE ON DISARMAMENT

CD/1083
13 June 1991

Original: ENGLISH

RECOMMENDATION

by the Ad Hoc Committee on Chemical Weapons

(Adopted by the Conference on Disarmament at the 595th plenary meeting on 13 June 1991)

Taking into account the present stage of its work and with the view, as a matter of high priority, to intensifying ongoing negotiations the Ad Hoc Committee on Chemical Weapons recommends to the Conference on Disarmament that, without prejudice to any further decision on the organization and programme of the work of the Committee during the period up until the start of the 1992 session of the Conference on Disarmament, the Ad Hoc Committee hold an additional regular session of limited duration during the period 8 to 19 July 1991.

GE.91-61289/0085A

CONFERENCE ON DISARMAMENT

CD/1084
14 June 1991

Original: ENGLISH

LETTER DATED 7 JUNE 1991 FROM THE PERMANENT REPRESENTATIVE OF NORWAY ADDRESSED TO THE PRESIDENT OF THE CONFERENCE ON DISARMAMENT TRANSMITTING A RESEARCH REPORT ON VERIFICATION OF A CHEMICAL WEAPONS CONVENTION ENTITLED "DEVELOPMENT OF PROCEDURES FOR VERIFICATION OF ALLEGED USE OF CHEMICAL WARFARE AGENTS. APPLICATION OF PROCEDURES AFTER A SIMULATED CHEMICAL ATTACK ON AN AIR BASE. PART X" *

I have the honour to transmit to you a research report entitled Development of procedures for verification of alleged use of chemical warfare agents. Application of procedures after a simulated chemical attack on an air base. Part X, published by the Royal Norwegian Ministry of Foreign Affairs.

I would appreciate if the report would be circulated as an official CD document.

(Signed) Oscar Voernø
Ambassador
Permanent Representative

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* A limited distribution of the document in English only has been made to the members of the Conference on Disarmament. Additional copies are available from the Permanent Mission of Norway in Geneva.

GE.91-61301/0459H

CONFERENCE ON DISARMAMENT

CD/1085
20 June 1991

Original: ENGLISH

Decision on the Mandate of the Ad Hoc Committee on Chemical Weapons

(Adopted by the Conference at its 596th plenary meeting on 20 June 1991)

The Conference on Disarmament, referring to its decision of 14 February 1991 on the re-establishment of the Ad Hoc Committee on Chemical Weapons (CD/1058), decides to further mandate this Committee to intensify, as a priority task, the negotiations on a multilateral convention on the complete and effective prohibition of the development, production, stockpiling and use of chemical weapons and on their destruction with the view to striving to achieve a final agreement on the Convention by 1992. A report on the progress of the negotiations, should be recorded in the report which this Ad Hoc Committee will submit to the Conference at the end of the third part of its 1991 session.

GE.91-61427/6436a

CONFERENCE ON DISARMAMENT

CD/1086
28 June 1991

Original: ENGLISH

LETTER DATED 25 JUNE 1991 FROM THE DEPUTY REPRESENTATIVE OF THE UNITED STATES OF AMERICA ADDRESSED TO THE PRESIDENT OF THE CONFERENCE ON DISARMAMENT TRANSMITTING INFORMATION REGARDING UNITED STATES EXPORT CONTROLS ON CHEMICAL WEAPONS-RELATED MATERIALS AND TECHNOLOGY AND UNITED STATES DOMESTIC LEGISLATION TO ENFORCE THEM

I have the honour to forward to you the attached package of information regarding United States export controls on chemical weapons-related materials and technology and our domestic legislation to enforce them.

I request that you take the appropriate steps to register this package of information as an official document of the Conference on Disarmament and to have it distributed to all member delegations and non-member States participating in the work of the Conference.

(Signed) M. LYALL BRECKON
Deputy Representative of the
United States of America to
the Conference on Disarmament

GE.91-61542/6482a

Information Package on U.S. Export Controls

In his May 13, 1991 Chemical Weapons Convention initiative, President Bush announced that the United States would provide extensive information to other states regarding U.S. export controls on chemical weapons-related materials and technology and U.S. domestic legislation to enforce them. The U.S. CD delegation is pleased to make this information available to all interested states. We hope that it will be useful to other states engaged in the process of enacting similar non-proliferation controls.

The following materials are included in this package:

- Executive Order 12735. Issued by the White House on November 16, 1990, Executive Order 12735 instructed all heads of departments or agencies of the United States government to take appropriate actions to halt CW/BW proliferation, including controls on any exports that would assist a country in acquiring the capability to develop, produce, stockpile, deliver or use chemical or biological weapons.

- White House Fact Sheet on Enhanced Proliferation Control Initiative. This December 13, 1990 statement launches the Enhanced Proliferation Control Initiative (EPCI) as a response to the President's call for increased U.S. government efforts to combat the spread of weapons of mass destruction.

- White House Press Statement and Fact Sheet on New Nonproliferation Initiatives. This March 7, 1991 statement announces the publication of regulations intended to implement both Executive Order 12735 and the Enhanced Proliferation Control Initiative.

- Federal Register Regulations. On March 13, 1991, the Department of Commerce issued implementing regulations which, inter alia, established worldwide export controls on fifty chemical weapons precursors identified by the Australia Group list.

THE WHITE HOUSE

Office of the Press Secretary

November 16, 1990

EXECUTIVE ORDER

12735

CHEMICAL AND BIOLOGICAL WEAPONS
PROLIFERATION

By the authority vested in me as President by the Constitution and the laws of the United States of America, including the International Emergency Economic Powers Act (50 U.S.C. 1701 et seq.), the National Emergencies Act (50 U.S.C. 1601 et seq.), and section 301 of title 3 of the United States Code,

I, GEORGE BUSH, President of the United States of America, find that proliferation of chemical and biological weapons constitutes an unusual and extraordinary threat to the national security and foreign policy of the United States and hereby declare a national emergency to deal with that threat.

Accordingly, I hereby order:

Section 1. International Negotiations. It is the policy of the United States to lead and seek multilaterally coordinated efforts with other countries to control the proliferation of chemical and biological weapons. The Secretary of State shall accordingly ensure that the early achievement of a comprehensive global convention to prohibit the production and stockpiling of chemical weapons, with adequate provisions for verification, shall be a top priority of the foreign policy of the United States, and the Secretary of State shall cooperate in and lead multilateral efforts to stop the proliferation of chemical weapons.

Sec. 2. Imposition of Controls. As provided herein, the Secretary of State and the Secretary of Commerce shall use their authorities, including the Arms Export Control Act and Executive Order No. 12730, respectively, to control any exports that either Secretary determines would assist a country in acquiring the capability to develop, produce, stockpile, deliver, or use chemical or biological weapons. The Secretary of State shall pursue early negotiations with foreign governments to adopt effective measures comparable to those imposed under this order.

Sec. 3. Department of Commerce Controls. (a) The Secretary of Commerce shall prohibit the export of any goods, technology, or services subject to his export jurisdiction that the Secretary of Commerce and the Secretary of State determine, in accordance with regulations issued pursuant to this order, would assist a foreign country in acquiring the capability to develop, produce, stockpile, deliver, or use chemical or

biological weapons. The Secretary of Commerce and the Secretary of State shall develop an initial list of such goods, technology, and services within 90 days of this order. The Secretary of State shall pursue early negotiations with foreign governments to adopt effective measures comparable to those imposed under this section.

(b) Subsection (a) will not apply to exports if their destination is a country with whose government the United States has entered into a bilateral or multilateral arrangement for the control of chemical or biological weapons-related goods (including delivery systems) and technology, or maintains domestic export controls comparable to controls that are imposed by the United States with respect to such goods and technology or that are otherwise deemed adequate by the Secretary of State.

(c) The Secretary of Commerce shall require validated licenses to implement this order and shall coordinate any license applications with the Secretary of State and the Secretary of Defense.

Sec. 4. Sanctions Against Foreign Persons. (a) Sanctions shall be imposed on foreign persons with respect to chemical and biological weapons proliferation, as specified in subsections (b)(1) through (b)(5).

(b)(1) Sanctions shall be imposed on a foreign person if the Secretary of State determines that the foreign person on or after the effective date of this order knowingly and materially contributed to the efforts of a foreign country referred to in subsection (2) to use, develop, produce, stockpile, or otherwise acquire chemical or biological weapons.

(2) The countries referred to in subsection (1) are those that the Secretary of State determines have either used chemical or biological weapons in violation of international law or have made substantial preparations to do so on or after the effective date of this order.

(3) No department or agency of the United States Government may procure, or enter into any contract for the procurement of, any goods or services from any foreign person referred to in subsection (1). The Secretary of the Treasury shall prohibit the importation into the United States of products produced by that foreign person.

(4) Sanctions imposed pursuant to this section may be terminated or not imposed against foreign persons if the Secretary of State determines that there is reliable evidence that the foreign person concerned has ceased all activities referred to in subsection (1).

(5) The Secretary of State and the Secretary of the Treasury may provide appropriate exemptions for procurement contracts necessary to meet U.S. operational military requirements or requirements under defense production agreements, sole source suppliers, spare parts, components, routine servicing and maintenance of products, and medical and humanitarian items. They may provide exemptions for contracts in existence on the date of this order under appropriate circumstances.

Sec. 5. Sanctions Against Foreign Countries. (a) Sanctions shall be imposed on foreign countries with respect to chemical and biological weapons proliferation, as specified in subsections (b) and (c).

(b) The Secretary of State shall determine whether any foreign country has, on or after the effective date of this order, (1) used chemical or biological weapons in violation of international law; or (2) made substantial preparations to use chemical or biological weapons in violation of international law; or (3) developed, produced, or stockpiled chemical or biological weapons in violation of international law.

(c) The following sanctions shall be imposed on any foreign country identified in subsection (b)(1) unless the Secretary of State determines that any individual sanction should not be applied due to significant foreign policy or national security reasons. The sanctions specified in this section may be made applicable to the countries identified in subsections (b)(2) or (b)(3) when the Secretary of State determines that such action will further the objectives of this order pertaining to proliferation. The sanctions specified in subsection (c)(2) below shall be imposed with the concurrence of the Secretary of the Treasury.

(1) Foreign Assistance. No assistance shall be provided to that country under the Foreign Assistance Act of 1961 or the Arms Export Control Act other than assistance that is intended to benefit the people of that country directly and that is not channeled through governmental agencies or entities of that country.

(2) Multilateral Development Bank Assistance. The United States shall oppose any loan or financial or technical assistance to that country by international financial institutions in accordance with section 701 of the International Financial Institutions Act (22 U.S.C. 262d).

(3) Denial of Credit or Other Financial Assistance. The United States shall deny to that country any credit or financial assistance by any department, agency, or instrumentality of the United States Government.

(4) Prohibition on Arms Sales. The United States Government shall not, under the Arms Export Control Act, sell to that country any defense articles or defense services or issue any license for the export of items on the United States Munitions List.

(5) Exports of National Security-Sensitive Goods and Technology. No exports shall be permitted of any goods or technologies controlled for national security reasons under Export Administration Regulations.

(6) Further Export Restrictions. The Secretary of Commerce shall prohibit or otherwise substantially restrict exports to that country of goods, technology, and services (excluding agricultural commodities and products otherwise subject to control).

(7) Import Restrictions. Restrictions shall be imposed on the importation into the United States of articles (which may include petroleum or any petroleum product) that are the growth, product, or manufacture of that country.

(8) Landing Rights. At the earliest practicable date, the Secretary of State shall terminate, in a manner consistent with international law, the authority of any air carrier that is controlled in fact by the government of that country to engage in air transportation (as defined in section 101(10) of the Federal Aviation Act of 1958 (49 U.S.C. App. 1301(10)).

Sec. 6. Duration. Any sanctions imposed pursuant to sections 4 or 5 shall remain in force until the Secretary of State determines that lifting any sanction is in the foreign policy or national security interests of the United States or, as to sanctions under section 4, until the Secretary has made the determination under section 4(b)(4).

Sec. 7. Implementation. The Secretary of State, the Secretary of the Treasury, and the Secretary of Commerce are hereby authorized and directed to take such actions, including the promulgation of rules and regulations, as may be necessary to carry out the purposes of this order. These actions, and in particular those in sections 4 and 5, shall be made in consultation with the Secretary of Defense and, as appropriate, other agency heads. The Secretary concerned may redelegate any of these functions to other officers in agencies of the Federal Government. All heads of departments and agencies of the United States Government are directed to take all appropriate measures within their authority to carry out the provisions of this order, including the suspension or termination of licenses or other authorizations.

Sec. 8. Judicial Review. This order is not intended to create, nor does it create, any right or benefit, substantive or procedural, enforceable at law by a party against the United States, its agencies, officers, or any other person.

Sec. 9. Effective Date. This order is effective immediately.

This order shall be transmitted to the Congress and published in the Federal Register.

GEORGE BUSH

THE WHITE HOUSE,
November 16, 1990.

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THE WHITE HOUSE

Office of the Press Secretary

December 13, 1990

FACT SHEET ON ENHANCED PROLIFERATION CONTROL INITIATIVE

Responding to the President's call in his speech before the UN General Assembly to "redouble our efforts to stem the spread" of missile technology as well as nuclear, chemical, and biological weapons, an interagency study proposed a series of measures designed to ensure that these weapons and the technology to make them do not fall into the wrong hands. The "Enhanced Proliferation Control Initiative" includes the following elements:

1. The United States shall adopt worldwide export controls on 50 precursors for chemical weapons and shall urge all nations that manufacture these chemicals to adopt equivalent controls.

2. Export licenses shall be required for proposed exports of potentially chemical-weapon-related industrial facilities, and related designs and technology.

3. Export licenses shall be required for any export destined for a publicly-listed company, ministry, project, or other entity that is engaged in activities of proliferation concern.

4. Export licenses shall be required when an exporter knows or is informed by the U.S. Government that a proposed export may be destined for a project of proliferation concern. (A similar regulation already applies to exports of possible nuclear-weapon concerns.)

5. Current regulations shall be supplemented by control lists of (i) dual-use equipment and technology related to chemical weapons, biological weapons, and missiles, and (ii) countries to which such equipment and technology shall be controlled.

6. Civil and criminal penalties shall be imposed upon U.S. citizens who knowingly participate in activities that promote the spread of missile technology and chemical weapons. (Similar penalties already apply in the areas of nuclear and biological weapons.)

These measures will implement portions of Executive Order No. 12735, issued by President Bush on November 16, 1990, to combat the spread of chemical and biological weapons. Close consultations with members of Congress and American industry will now be required to ensure the effective implementation of these measures by February 16.

The United States will seek the widest and earliest multilateral concurrence in these measures, recognizing that the support of other supplier nations is essential to effective export controls.

# # #

THE WHITE HOUSE

Office of the Press Secretary

March 7, 1991

The United States has taken a major step in its continuing efforts to halt the spread of weapons of mass destruction, with the issuance of regulations extending export controls over chemicals, equipment, and other assistance that can contribute to the spread of missiles and chemical and biological weapons.

Saddam Hussein's use of chemical weapons against his own citizens, his use of SCUD missiles to terrorize civilian populations, and the chilling specter of germ warfare and nuclear weapons have brought home the dangers proliferation poses to American interests and global peace and stability.

Our continuing efforts to stem the spread of weapons of mass destruction will contribute to the construction of a New World Order. The new regulations will enhance our ability to head off these dangers so that, in the future, we will not be forced to confront them militarily as we have in Iraq. At the same time, the new regulations are sensitive to the importance of U.S. exports to our economic vitality, and will not unfairly restrict legitimate commerce.

The expanded U.S. export controls apply to equipment, chemicals, and whole plants that can be used to manufacture chemical or biological weapons, as well as to activities of U.S. exporters or citizens when they know or are informed that their efforts will assist in a foreign missile or chemical or biological weapon program.

But the United States cannot do the job alone. Our experience in the Gulf has reinforced the lesson that the most effective export controls are those imposed multilaterally. The Administration has therefore initiated vigorous efforts to obtain allied support for chemical and biological weapon export controls in the Australia Group, missile export controls in the Missile Technology Control Regime, and nuclear export controls through consultations with all major nuclear suppliers. These efforts will take advantage of the growing international consensus to redouble our efforts to stem the spread of weapons of mass destruction.

The proliferation of weapons of mass destruction may profoundly challenge our national security in the 1990s. The new regulations issued today and our multilateral initiatives will enhance our ability to meet that challenge squarely.

# # #

FACT SHEET ON NEW NONPROLIFERATION REGULATIONS

Three regulations are being published in the Federal Register. These regulations will contribute to our nonproliferation efforts by implementing parts of the Executive Order on chemical and biological weapons (CBW) issued by the President last November and the Enhanced Proliferation Controls Initiative launched last December. At the same time, the regulations have been designed to minimize interference with legitimate international trade.

The first regulation establishes a list of dual-use equipment with legitimate commercial uses, but also potential applications to chemical and biological weapons production. Licenses will now be required before exporting any such dual-use equipment to particularly sensitive regions, such as the Middle East and Southwest Asia, as well as to countries elsewhere whose activities may have CBW-related implications. The equipment list, which reflects a three-month effort involving extensive consultations with industry, is unprecedented: Never before have U.S. export licenses been required for dual-use, CBW-related equipment.

The second regulation expands from eleven to fifty the list of "precursor chemicals" that require an export license. Like dual-use equipment, these chemicals are commonly used in commercial products. But they have also been identified by the Australia Group as key ingredients in the manufacture of chemical weapons. The Australia Group is a multilateral forum of twenty supplier nations (including the United States) committed to restricting the spread of chemical weapons. The United States will now join the growing number of Australia Group members that require a license to export any of the fifty precursor chemicals to any country outside the Group.

The third regulation provides additional controls, focused on knowing exports or other support by U.S. firms or individuals for CBW or missile programs abroad. Under its terms, if the U.S. government learns of possible American assistance to such programs, it will be able to intervene to prevent it. This regulation will impose new licensing requirements in the following instances:

(1) A U.S. person knows that a proposed export or other assistance is destined for CBW or missile activities in listed regions, countries, or projects;

(2) A U.S. person is informed by the U.S. Government that a proposed export or other assistance is destined for CBW or missile activities anywhere in the world; or

(3) An export of a whole chemical plant that manufactures any of the 50 chemical precursors, or assistance in designing such a plant, is destined to any country outside the Australia Group.

The new restriction on participation by U.S. persons in CW or missile-related projects is similar to export restrictions that already apply to BW- and nuclear-related exports. Civil and criminal penalties may be imposed upon those who breach these controls.

The regulations providing controls on dual-use equipment and precursor chemicals already have been the subject of extensive consultations with industry, and will be issued as interim rules. In this form, the regulations will be effective on the date of publication, although they may be modified following the thirty-day public comment period. The third regulation imposing additional controls is being issued as a proposed rule. This regulation will become effective when a final rule is issued, after the close of the thirty-day public comment period.

To be truly effective, comparable controls must be applied by all major suppliers. To that end, the Administration is vigorously pursuing multilateral adoption of these new export controls in the Australia Group, the Missile Technology Control Regime, and various international nuclear fora.

federal register

Wednesday
March 13, 1991

Part VI

Department of Commerce

Bureau of Export Administration

15 CFR Parts 770, 776, 778, and 799
Expansion of Foreign Policy Controls on Chemical Weapon Precursors; Imposition of Foreign Policy Controls on Equipment and Technical Data Related to the Production of Chemical and Biological Weapons; Interim Rules

15 CFR Parts 771, 776, and 778
Imposition and Expansion of Foreign Policy Controls; Proposed Rule

DEPARTMENT OF COMMERCE

Bureau of Export Administration

15 CFR Parts 776 and 799

[Docket No. 910237-1037]

Expansion of Foreign Policy Controls on Chemical Weapon Precursors

AGENCY: Bureau of Export Administration, Commerce.

ACTION: Interim rule with request for comments.

SUMMARY: In support of U.S. policies opposing the proliferation and use of chemical weapons, the Department of Commerce is expanding the foreign policy controls on exports of certain chemical weapon precursors (i.e., chemicals that can be used in the manufacture of chemical weapons).

This interim rule amends the Commodity Control List (CCL), Supplement No. 1 to § 799.1 of the Export Administration Regulations (EAR), by expanding the number of countries for which a validated license is required for thirty-nine precursor chemicals. Under this rule, the thirty-nine chemicals will require a validated license for export to all destinations except NATO member countries, Australia, Austria, Ireland, Japan, New Zealand, and Switzerland. Previously, these chemicals required a validated license only for export to Country Groups S and Z, Iran, Iraq, Syria, and military and police entities in the Republic of South Africa.

DATES: This rule is effective March 13, 1991. Comments must be received by April 12, 1991.

ADDRESSES: Written comments (six copies) should be sent to Willard Fisher, Office of Technology and Policy Analysis, Bureau of Export Administration, Department of Commerce, P.O. Box 273, Washington, DC 20044.

FOR FURTHER INFORMATION CONTACT: For questions on foreign policy controls, call Toni Jackson, Office of Technology and Policy Analysis, Bureau of Export Administration, Telephone: (202) 377-4531.

For questions of a technical nature on chemical weapon precursors, call James Seevaratnam, Office of Technology and Policy Analysis, Bureau of Export Administration, Telephone: (202) 377-5695.

SUPPLEMENTARY INFORMATION:

Background

This interim rule expands the number of countries for which a validated license is required to export thirty-nine precursor chemicals. Under this rule, a validated license is now required to export these chemicals to all destinations except NATO member countries, Australia, Austria, Ireland, Japan, New Zealand, and Switzerland. This rule amends the CCL by adding to ECCN 4798B the thirty-nine chemicals formerly controlled under ECCN 5798F and removing ECCN 5798F from the CCL.

The changes made by this rule address one of the measures called for in President Bush's December 13, 1990, decision on the Enhanced Proliferation Control Initiative (EPCI) and included in Executive Order 12735 of November 16, 1990, on chemical and biological weapons proliferation. Executive Order 12735 of November 16, 1990, directs the Secretary of Commerce to exercise his authority under Executive Order 12730 to control exports that the Secretary determines would assist a country in acquiring the capability to develop, produce, stockpile, deliver, or use chemical or biological weapons. The EPCI directs the Commerce Department to adopt worldwide export controls on fifty chemical weapons precursors. Worldwide controls were already in place for eleven of these fifty chemicals under ECCN 4798B. The revision to ECCN 4798B, which adds the thirty-nine chemicals formerly controlled under ECCN 5798F, provides worldwide export controls on all fifty chemicals consistent with the President's directive. These fifty chemicals have been identified as precursors by the twenty-nation Australia Group, which seeks to control the proliferation of chemical weapons. The United States will seek the agreement of all Australia Group governments to adopt equivalent controls.

Consistent with the expansion of foreign policy controls on exports of chemical precursors, this rule also amends § 776.19 to apply the reexport provisions of part 774 to reexports of chemical precursors controlled under ECCN 4798B and to apply the parts and components provisions of § 776.12 to all items controlled under ECCNs 4798B, 4997B, and 4998B.

This rule also amends Supplement No. 1 to § 799.2 (Commodity Interpretations) by revising "Interpretation 23: Precursor Chemicals" to reflect the changes in the list of chemicals controlled by ECCN 4798B and the removal of ECCN 5798F.

The general policy of denying applications to export or reexport chemicals controlled under ECCN 4798B to Iran, Iraq, Libya and Syria remains in effect. Exports and reexports to other destinations will generally be approved unless there is reason to believe the chemicals will be used in producing chemical weapons or otherwise devoted to chemical warfare purposes.

The contract sanctity provisions contained in this rule are consistent with the requirements of the Export Administration Act of 1979, as amended (EAA). However, serious consideration is being given to eliminating these contract sanctity provisions when the final rule is published, in light of the serious concerns raised by chemical and biological weapons. The Department invites public comments on this issue, as well as all other aspects of the regulation.

The Department of Commerce has submitted a report to the Congress to support this expansion in U.S. foreign policy controls.

Saving Clause

Shipments of items removed from general license authorization as a result of this regulatory action that were on dock for loading, on lighter, laden aboard an exporting carrier, or en route aboard a carrier to a port of export pursuant to actual orders for export before March 27, 1991, may be exported under the previous general license provisions up to and including April 10, 1991. Any such items not actually exported before midnight April 10, 1991, require a validated export license in accordance with this regulation.

Rulemaking Requirements

1. This rule is consistent with Executive Orders 12291 and 12661.

2. This rule involves collections of information subject to the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 *et seq.*). These collections have been approved by the Office of Management and Budget under control numbers 0694-0005 and 0694-0010.

3. This rule does not contain policies with Federalism implications sufficient to warrant preparation of a Federalism assessment under Executive Order 12612.

4. Because a notice of proposed rulemaking and an opportunity for public comment are not required to be given for this rule by section 553 of the Administrative Procedure Act (5 U.S.C. 553) or by any other law, under sections 603(a) and 604(a) of the Regulatory Flexibility Act (5 U.S.C. 603(a) and 604(a)) no initial or final Regulatory Flexibility Analysis has to be or will be prepared.

5. The provisions of the Administrative Procedure Act, 5 U.S.C. 553, requiring notice of proposed rulemaking, the opportunity for public

participation, and a delay in effective date, are inapplicable because this regulation involves a foreign and military affairs function of the United States. No other law requires that a notice of proposed rulemaking and an opportunity for public comment be given for this rule.

However, because of the importance of the issues raised by these regulations, this rule is issued in interim form and comments will be considered in the development of final regulations. Accordingly, the Department encourages interested persons who wish to comment to do so at the earliest possible time to permit the fullest consideration of their views. Comments on the contract sanctity provisions contained in this rule are especially encouraged.

The period for submission of comments will close April 12, 1991. The Department will consider all comments received before the close of the comment period in developing final regulations. Comments received after the end of the comment period will be considered if possible, but their consideration cannot be assured. The Department will not accept public comments accompanied by a request that a part or all of the material be treated confidentially because of its business proprietary nature or for any other reason. The Department will return such comments and materials to the person submitting the comments and will not consider them in the development of final regulations. All public comments on these regulations will be a matter of public record and will be available for public inspection and copying. In the interest of accuracy and completeness, the Department requires comments in written form. Oral comments must be followed by written memoranda, which will also be a matter of public record and will be available for public review and copying. Communications from agencies of the United States Government or foreign governments will not be made available for public inspection.

The public record concerning these regulations will be maintained in the Bureau of Export Administration Freedom of Information Records Inspection Facility, room 4525, Department of Commerce, 14th Street and Pennsylvania Avenue, NW., Washington, DC 20230. Records in this facility, including written public comments and memoranda summarizing the substance of oral communications, may be inspected and copied in accordance with regulations published in part 4 of title 15 of the Code of Federal Regulations. Information about the inspection and copying of records at the facility may be obtained from Margaret Cornejo, Bureau of Export Administration Freedom of Information Officer, at the above address or by calling (202) 377-5653.

List of Subjects in 15 CFR Parts 776 and 799

Exports, Reporting and recordkeeping requirements.

Accordingly, parts 776 and 799 of the Export Administration Regulations (15 CFR parts 730-799) are amended as follows:

1. The authority citation for 15 CFR parts 776 and 799 continues to read as follows:

Authority: Pub. L. 96-72, 93 Stat. 503 (50 U.S.C. app. 2401 *et seq.*), as amended Pub. L. 95-223 of December 28, 1977 (50 U.S.C. 1701 *et seq.*); E.O. 12730 of September 30, 1990 (55 FR 40373, October 2, 1990); E.O. 12735 of November 16, 1990 (55 FR 48587, November 20, 1990).

PART 776—[AMENDED]

§ 776.19 [Amended]

2. Section 776.19 is amended:

a. By removing paragraph (a)(ii) and redesignating paragraphs (a)(i) and (a)(iii) as new paragraphs (a)(1) and (a)(2), respectively;

b. By revising paragraphs (b) and (e);

c. By removing paragraph (i);

d. By redesignating paragraphs (f), (g), and (h) as new paragraphs (g), (h), and (i), respectively;

e. By adding a new paragraph (f);

f. By removing paragraph (l) and redesignating paragraph (m) as new paragraph (n);

g. By redesignating paragraphs (j) and (k) as new paragraphs (l) and (m), respectively; and

h. By adding new pargraphs (j) and (k), as follows:

§ 776.19 Chemical and biological agents.

* * * * *

(b) Unless one or more of the criteria stated in paragraphs (c) through (k) of this section are met, applications to export the goods in ECCNs 4798B, 4997B, and 4998B will generally be denied to Libya, Iran, Iraq, and Syria. Applications will generally be approved to other destinations, except where there is reason to believe that those goods will be used in producing chemical or biological weapons or will otherwise be devoted to chemical or biological warfare purposes.

* * * * *

(e) The contract sanctity date for exports of items in ECCNs 4997B and 4998B from the United States to Iran, Iraq, or Syria is February 22, 1989.

(f) The contract sanctity date for exports of the following chemicals from the United States to Iran or Iraq is February 22, 1989: Dimethyl methylphosphonate, methylphosphonyl dichloride, methylphosphonyl difluoride, phosphorus oxychloride, and thiodiglycol. The contract sanctity date for exports of the following chemicals from the United States to Syria is February 22, 1989: Dimethyl methylphosphonate, methylphosphonyl dichloride, and methylphosphonyl difluoride.

* * * * *

(j) The contract sanctity date for exports of chemicals controlled by ECCN 4798B from the United States to all destinations (except Iran, Iraq, Libya, or Syria) is March 7, 1991, except for applications to export the following chemicals: 2-chloroethanol, dimethyl methylphosphonate, dimethyl phosphite (dimethyl hydrogen phosphite), methylphosphonyl dichloride, methylphosphonyl difluoride, phosphorus oxychloride, phosphorous trichloride, thiodiglycol, thionyl chloride, triethanolamine, and trimethyl phosphite. (See also paragraphs (h) and (i) of this section.) This provision does not apply to exports to Country group Z or to military or police entities in the Republic of South Africa. For exports to Iran, Iraq, Libya, Syria, see paragraphs (c) through (g) of this section.

(k) The contract sanctity date for reexports of chemicals controlled under ECCN 4798B to any destination (except Iran, Iraq, Libya, or Syria) is March 7, 1991. The contract sanctity date for reexports of these chemicals to Iran, Iraq, Libya, or Syria is December 12, 1989. This provision does not apply to exports to Country Group Z or to military or police entities in the Republic of South Africa.

* * * * *

PART 799—[AMENDED]

Supplement No. 1 to § 799.1 [Amended]

3. In Supplement No. 1 to Section 799.1 (the Commodity Control List), Commodity Group 7 (Chemicals, Metalloids, Petroleum Products, and Related Materials), ECCN 4798B is amended by revising the List of Chemicals Controlled, as follows:

4798B Precursor and intermediate chemicals used in the production of chemical warfare agents.

* * * * *

List of Chemicals Controlled by ECCN 4798B

(See Supplement No. 1 to 799.2, Interpretation 23: Precursor Chemicals, for synonyms for the following chemicals.)

(1) (C.A.S. #1341-49-7) Ammonium hydrogen fluoride;

(2) (C.A.S. #7784-34-1) Arsenic trichloride;

(3) (C.A.S. #76-93-7) Benzilic acid;

(4) (C.A.S. #107-07-3) 2-Chloroethanol;

(5) (C.A.S. #78-38-6) Diethyl ethylphosphonate;

(6) (C.A.S. #15715-41-0) Diethyl methylphosphonite;

(7) (C.A.S. #2404-03-7) Diethyl-N,N-dimethylphosphoroamidate;

(8) (C.A.S. #762-04-9) Diethyl phosphite;

(9) (C.A.S. #100-37-8) N,N-Diethylethanolamine;

(10) (C.A.S. #5842-07-9) N,N-Diisopropyl-.beta.-aminoethane thiol;

(11) (C.A.S. #96-80-0) N,N-Diisopropyl-.beta.-aminoethanol;

(12) (C.A.S. #96-79-7) N,N-Diisopropyl-.beta.-aminoethyl chloride;

(13) (C.A.S. #108-18-9) Diisopropylamine;

(14) (C.A.S. #6163-75-3) Dimethyl ethylphosphonate;

(15) (C.A.S. #756-79-6) Dimethyl methylphosphonate;

(16) (C.A.S. #868-85-9) Dimethyl phosphite [dimethyl hydrogen phosphite];

(17) (C.A.S. #124-40-3) Dimethylamine;

(18) (C.A.S. #506-59-2) Dimethylamine hydrochloride;

(19) (C.A.S. #57856-11-8) O-Ethyl-2-diisopropylaminoethyl methylphosphonite (QL);

(20) (C.A.S. #1498-40-4) Ethylphosphonous dichloride [Ethylphosphinyl dichloride]; [1]

(21) (C.A.S. #430-78-4) Ethylphosphonus difluoride [Ethylphosphinyl difluoride]; [2]

(22) (C.A.S. #1066-50-8) Ethylphosphonyl dichloride;

(23) (C.A.S. #753-98-0) Ethylphosphonyl difluoride;

(24) (C.A.S. #7664-39-3) Hydrogen fluoride;

(25) (C.A.S. #3554-74-3) 3-Hydroxyl-l-methylpiperidine;

(26) (C.A.S. #76-89-1) Methyl Benzilate;

(27) (C.A.S. #676-83-5) Methylphosphonous dichloride [Methylphosphinyl dicloride]; [3]

(28) (C.A.S. #753-59-3) Methylphosphonous difluoride [Methylphosphinyl difluoride]; [4]

(29) (C.A.S. #676-97-1) Methylphosphonyl dichloride;

(30) (C.A.S. #676-99-3) Methylphosphonyl difluoride;

(31) (C.A.S. #10025-87-3) Phosphorus Oxychloride;

(32) (C.A.S. #10026-13-8) Phosphorus peatachloride;

(33) (C.A.S. #1314-80-3) Phosphorus pentasulfide;

(34) (C.A.S. #7719-12-2) Phosphorus trichloride;

(35) (C.A.S. #75-97-8) Pinacolone;

(36) (C.A.S. #464-07-3) Pinacolyl alcohol;

(37) (C.A.S. #151-50-8) Potassium cyanide;

(38) (C.A.S. #7789-23-3) Potassium fluoride;

(39) (C.A.S. #7789-23-9) Potassium hydrogen fluoride;

(40) (C.A.S. #1619-34-7) 3-Quinuclidinol;

(41) (C.A.S. #3731-38-2) 3-Quinuclidinone;

(42) (C.A.S. #1333-83-1) Sodium bifluoride;

(43) (C.A.S. #143-33-9) Sodium cyanide;

(44) (C.A.S. #7681-49-4) Sodium fluoride;

(45) (C.A.S. #1313-82-2) Sodium sulfide;

(46) (C.A.S. #111-48-8) Thiodiglycol;

(47) (C.A.S. #7719-09-7) Thionyl chloride;

(48) (C.A.S. #102-71-6) Triethanolamine;

(49) (C.A.S. #122-52-1) Triethyl phosphite; and

(50) (C.A.S. #121-45-9) Trimethyl phosphite.

4. In Supplement No. 1 to § 799.1 (the Commodity Control List), Commodity Group 7 (Chemicals, Metalloids, Petroleum Products and Related Materials), ECCN 5798F is removed.

Supplement No. 1 to § 799.2 [Amended]

5. In Supplement No. 1 to § 799.2 (Interpretations), Interpretation 23 (Precursor Chemicals) is revised to read as follows:

Interpretation 23: Precursor Chemicals

Following is a listing of chemicals controlled by ECCN 4798B that includes their Chemical Abstract Service Registry (C.A.S.) number and synonyms (i.e., alternative names). These chemicals require a validated license to all countries except Australia, Austria, Belgium, Canada, Denmark, the Federal Republic of Germany, France, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Switzerland, Turkey, and the United Kingdom.

(1) (C.A.S. #1341-49-7) Ammonium hydrogen fluoride
- Acid ammonium fluoride
- Ammonium bifluoride
- Ammonium difluoride
- Ammonium hydrofluoride
- Ammonium hydrogen bifluoride
- Ammonium hydrogen difluoride
- Ammonium monohydrogen difluoride

(2) (C.A.S. #7784-34-1) Arsenic trichloride
- Arsenic (III) chloride
- Arsenous chloride
- Fuming liquid arsenic
- Trichloroarsine

(3) (C.A.S. #76-93-7) Benzilic acid
- .alpha.,.alpha.-Diphenyl-.alpha.-hydroxyacetic acid
- Diphenylglycolic acid
- .alpha.,.alpha.-Diphenylglycolic acid
- Diphenylhydroxyacetic acid
- .alpha.-Hydroxy-2,2-diphenylacetic acid
- 2-Hydroxy-2,2-diphenylacetic acid
- .alpha.-Hydroxy-.alpha.-phenylbenzeneacetic acid
- Hydroxydiphenylacetic acid

(4) (C.A.S. #107-07-3) 2-Chloroethanol
- 2-Chloro-1-ethanol
- Chloroethanol
- 2-Chloroethyl alcohol
- Ethene chlorohydrin
- Ethylchlorohydrin
- Ethylene chlorhydrin
- Ethylene chlorohydrin
- Glycol chlorohydrin
- Glycol monochlorohydrin
- 2-Hydroxyethyl chloride

(5) (C.A.S. #78-38-6) Diethyl ethylphosphonate
- Ethylphosphonic acid diethyl ester

(6) (C.A.S. #15715-41-0) Diethyl methylphosphonite
- Diethoxymethylphosphine
- Diethyl methanephosphonite
- O,O-Diethyl methylphosphonite
- Methyldiethoxyphosphine
- Methylphosphonous acid diethyl ester

(7) (C.A.S. #2404-03-7) Diethyl-N,N-dimethylphosphoroamidate
- N,N-Dimethyl-O,O'-diethyl phosphoramidate
- Diethyl dimethylphosphoramidate
- Dimethylphosphoramidic acid diethyl ester

(8) (C.A.S. #762-04-9) Diethyl phosphite
- Diethoxyphosphine oxide
- Diethyl acid phosphite
- Diethyl hydrogen phosphite
- Diethyo phosphonate
- Hydrogen diethyl phosphite

(9) (C.A.S. #100-37-8) N,N-Diethylethanolamine
- N,N-Diethyl-2-aminoethanol
- Diethyl (2-hydroxyethyl)amine
- N,N-Diethyl-N-(.beta.-hydroxyethyl)amine
- N,N-Diethyl-2-hydroxyethylamine
- Diethylaminoethanol
- 2-(Diethylamino)ethanol
- Diethylaminoethyl alcohol
- N,N-Diethylmonoethanolamine
- (2-Hydroxyethyl)diethylamine
- 2-Hydroxytriethylamine

(10) (C.A.S. #5842-07-9) N,N-Diisopropyl-.beta.-aminoethane thiol
- 2-(Diisopropylamino) ethanethiol

[1] Chemical name used elsewhere in the List of Chemicals for this ECCN 4798B.

[2] See footnote 1 to this ECCN 4798B.

[3] See footnote 1 to this ECCN 4798B.

[4] See footnote 1 to this ECCN 4798B.

Diisopropylaminoethanethiol
.beta.-Diisopropylaminoethanethiol
2-(bis(1-Methylethyl)amino) ethanethiol
(11) (C.A.S. #96-80-0) N,N-Diisopropyl-.beta.-aminoethanol
N,N-Diisopropyl-2-aminoethanol
2-(Diisopropylamino) ethanol
(N,N-Diisopropylamino) ethanol
2-(Diisopropylamino) ethyl alcohol
N,N-Diisopropylethanolamine
(12) (C.A.S. #96-79-7) N,N-Diisopropyl-.beta.-aminoethyl chloride
2-Chloro-N,N-diisoproplethanamine
1-Chloro-N,N-diisopropylaminoethane
2-Chloro-N,N-diisopropylethylamine
N-(2-chlorethyl)-N-(1-methylethyl)-2-propanamine
N-(2-Chloroethyl) diisopropylamine
N,N-Diisopropyl-2-chloroethylamine
1-(Diisopropylamino)-2-cholorethane
2-(Diisopropylamino) ethyl chloride
Diisopropylaminoethyl chloride
.beta.-Diisopropylaminoethyl chloride
(13) (C.A.S. #108-18-9) Diisopropylamine
N,N Diisopropylamine
N-(1-Methylethyl)-2-propanamine
(14) (C.A.S. #6163-75-3) Dimethyl ethylphosphonate
Dimethyl ethanephosphonate
Ethylphosphonic acid dimethyl ester
(15) C.A.S. #756-79-6) Dimethyl methylphosphonate
Dimethoxymethyl phosphine oxide
Dimethyl methanephosphonate
Methanephosphonic acid dimethyl ester
Methylphosphonic acid dimethyl ester
(16) (C.A.S. #868-85-9) Dimethyl phosphite
Dimethoxphosphine oxide
Dimethyl acid phosphite
Dimethyl hydrogen phosphite
Dimethyl phosphonate
Hydrogen dimethyl phosphite
Methyl phosphonate
(17) (C.A.S. #124-40-3) Dimethylamine
N-Methyl methanamine
(18) (C.A.S. #506-59-2) Dimethylamine hydrochloride
Dimethylammonium chloride
N-Methyl methanamine hydrochloride
(19) (C.A.S. #57856-11-8) O-Ethyl-2-diisopropylaminoethyl methylphosphonite (QL)
Methylphosphonous acid 2-(bis(1-methylethyl)amino)ethyl ethyl ester
(20) (C.A.S. #1498-40-4) Ethylphosphonous dichloride
Dichloroethylphosphine
Ethyl phosphonous dichloride
Ethyldichlorophosphine
(21) (C.A.S. #430-78-4) Ethylphosphonus difluoride
Ethyldifluorophosphine
(22) (C.A.S. #1066-50-8) Ethylphosphonyl dichloride
Dichloroethylphosphine oxide
Ethanephosphonyl chloride
Ethylphosphinic dichloride
Ethylphosphonic acid dichloride
Ethylphosphonic dichloride
(23) (C.A.S. #753-98-0) Ethylphosphonyl difluoride
Ethyl difluorophosphite
Ethyldifluorophosphine oxide
Ethylphosphonic difluoride
(24) (C.A.S. #7664-39-3) Hydrogen fluoride
Anhydrous hydrofluoric acid
Fluorhydric acid
Fluorine monohydride
Hydrofluoric acid gas
(25) (C.A.S. #3554-74-3) 3-Hydroxyl-1-methylpiperidine
3-Hydroxy-N-methylpiperidine
1-Methyl-3-hdroxypiperidine
N-Methyl-3-hydroxypiperidine
1-Methyl-3-piperidinol
N-Methyl-3-piperidonol
(26) (C.A.S. #76-89-1) Methyl benzilate
Benzilic acid methyl ester
.alpha.-Hydroxy-.alpha.-phenylbenzeneacetic acid methyl ester
Methyl .alpha.-phenylmandelate
Methyl diphenylglycolate
(27) (C.A.S. #676-83-5) Methylphosphonous dichloride
Dichloromethylphosphine
Methyldichlorophosphine
Methylphosphorus dichloride
(28) (C.A.S. #753-59-3) Methylphosphonous difluoride
Difluoromethylphosphine
Methyldifluorophosphine
(29) (C.A.S. #676-97-1) Methylphosphonyl dichloride
Dichloromethylphosphine oxide
Methanephosphonodichloridic acid
Methanephosphonyl chloride
Methylphosphonic acid dichloride
Methylphosphonic dichloride
Methylphosphonodichloridic acid
Methylphosphonyl chloride
(30) (C.A.S. #676-99-3) Methylphosphonyl difluoride
Difluoromethylphosphine oxide
Methyl difluorophosphite
Methylphosphonic difluoride
(31) (C.A.S. #10025-87-3) Phosphorus oxychloride
Phosphonyl trichloride
Phosphoric chloride
Phosphoric trichloride
Phosphoroxychloride
Phosphoroxytrichloride
Phosphorus chloride oxide
Phosphorus monoxide trichloride
Phosphorus oxide trichloride
Phosphorus oxytrichloride
Phosphorus trichloride oxide
Phosphoryl trichloride
Trichlorophosphine oxide
Trichlorophosphorus oxide
(32) (C.A.S. #10026-13-8) Phosphorus pentachloride
Pentachlorophosphorane
Pentachlorophosphorus
Phosphoric chloride
Phosphorus(V) chloride
Phosphorus perchloride
(33) (C.A.S. #1314-80-3) Phosphorus pentasulfide
Diphosphorus pentasulfide
Phosphoric sulfide
Phosphorus persulfide
Phosphorus sulfide
(34) (C.A.S. #7719-12-2) Phosphorus trichloride
Phosphorus chloride
Trichlorophosphine
(35) (C.A.S. #75-97-8) Pinacolone
tert-Butyl methly ketone
2,2-Dimethyl-3-butanone
3,3-Dimethyl-2-butanone
2,2-Dimethylbutanone
3,3-Dimethylbutanone
1,1-Dimethylethyl methyl kentone
Methyl tert-butyl ketone
Pinacolin
Pinacoline
1,1,1-Trimethylacetone
(36) (C.A.S. #464-07-3) Pinacolyl alcohol
tert-Butyl methyl carbinol
2,2-Dimethyl-3-butanol
3,3-Dimethyl-2-butanol
1-Methyl-2,2-dimethylpropanol
(37) (C.A.S. #151-50-8) Potassium cyanide
(38) (C.A.S. #7789-23-3) Potassium fluoride
Potassium monofluoride
(39) (C.A.S. #7789-29-9) Potassium hydrogen fluoride
Hydrogen potassium difluoride
Hydrogen potassium fluoride
Potassium acid fluoride
Potassium bifluoride
Potassium hydrogen difluoride
Potassium monohydrogen difluoride
(40) (C.A.S. #1619-34-7) 3-Quinuclidinol
1-Azabicyclo(2.2.2)octan-3-ol
3-Hydroxyquinuclidine
(41) (C.A.S. #3731-38-2) 3-Quinuclidinone
1-Azabicyclo(2.2.2)octan-3-one
3-Oxyquinuclidine
Quinuclidone
(42) (C.A.S. #1333-83-1) Sodium bifluoride
Sodium hydrogen difluoride
Sodium hydrogen fluoride
Thiophosphoric anhydride
(43) (C.A.S. #143-33-9) Sodium cyanide
(44) (C.A.S. #7681-49-4) Sodium fluoride
Sodium monofluoride
(45) (C.A.S. #1313-82-2) Sodium sulfide
Disodium monosulfide
Disodium sulfide
Sodium monosulfide
Sodium sulphide
(46) (C.A.S. #111-48-8) Thiodiglycol
Bis(2-hydroxyethyl) sulfide
Bis(2-hydroxyethyl) thioether
Di(2-hydroxyethyl) sulfide
Diethanol sulfide
2,2'-Dithiobis-(ethanol)
3-Thiapentane-1,5-diol
2,2'-Thiobisethanol
2,2'-Thiodiethanol
Thiodiethylene glycol
2,2'-Thiodiglycol
(47) (C.A.S. #7719-09-7) Thionyl chloride
Sulfinyl chloride
Sulfinyl dichoioride
Sulfur chloride oxide
Sulfur oxychloride
Sulfurous dichloride
Sulfurous oxychloride
Thionyl dichloride
(48) (C.A.S. #102-71-6) Triethanolamine
Alkanolamine 244
Nitrilotriethanol
2,2',2''-Nitrilotriethenol
2,2',2''-Nitrilotris(ethanol)
TEA
TEA(amino alcohol)
Tri(2-hydroxyethyl)amine
Triethanolamine
Tris (.beta.-hydroxyethyl)amine
Tris(2-hydroxyethyl)amine
Trolamine
(49) (C.A.S. #122-52-1) Triethyl phosphite
Phosphorous acid triethyl ester
Triethoxyphosphine

Tris(ethoxy) phosphi··
(50) (C.A.S. #121-45-9) Trimethyl phosphite
Phosphorus acid trimethyl ester
Trimethoxyphosphine

Dated: March 7, 1991.

James M. LeMunyon,

Deputy Assistant Secretary for Export Administration.

[FR Doc. 91-5859 Filed 3-8-91; 4:25 pm]

BILLING CODE 3510-DT-M

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15 CFR Parts 770, 776, 778, and 799

[Docket No. 910241-1041]

Imposition of Foreign Policy Controls on Equipment and Technical Data Related to the Production of Chemical and Biological Weapons

AGENCY: Bureau of Export Administration, Commerce.

ACTION: Interim rule with request for comments.

SUMMARY: In support of U.S. policies opposing the proliferation and prohibited use of chemical and biological weapons, the Department of Commerce is imposing foreign policy controls on exports of certain dual-use equipment that can be used to produce:

(1) Chemicals or biological agents controlled by ECCNs 4798B, 4997B, or 4998B on the Commodity Control List (CCL), Supplement No. 1 to § 799.1 of the Export Administration Regulations (EAR);

(2) Chemicals or biological warfare agents controlled under the International Traffic in Arms Regulations (ITAR) (22 CFR parts 120-130).

The Department is also imposing foreign policy controls on technical data for the production of such equipment.

Specifically, this interim rule amends the Export Administration Regulations (EAR) to impose validated licensing requirements on exports of this equipment and technical data to Country Groups S and Z and countries listed in a new Supplement No. 5 to part 778 of the EAR.

DATES: This rule is effective March 13, 1991. Comments must be received by April 12, 1991.

ADDRESSES: Written comments (six copies) should be sent to Willard Fisher, Office of Technology and Policy Analysis, Bureau of Export Administration, Department of Commerce, P.O. Box 273, Washington, DC 20044.

FOR FURTHER INFORMATION CONTACT: For questions on foreign policy controls, call Toni Jackson, Office of Technology and Policy Analysis, Bureau of Export Administration, Telephone: (202) 377-4531.

For questions of a technical nature on chemical weapon precursors, biological agents, and equipment that can be used to produce chemical and biological agents, call James Seevaratnam, Office of Technology and Policy Analysis, Bureau of Export Administration, Telephone: (202) 377-5695.

SUPPLEMENTARY INFORMATION:

Background

This interim rule amends the Export Administration Regulations (EAR) to impose a validated licensing requirement on exports of certain equipment that can be used to produce the following:

(1) Chemicals or biological agents controlled under ECCNs 4798B, 4997B, or 4998B on the Commodity Control List (CCL);

(2) Chemicals and biological warfare agents controlled under the International Traffic in Arms Regulations (ITAR) (22 CFR parts 120-130), administered by the U.S. Department of State.

This rule also creates a new § 776.20, which imposes a validated licensing requirement on exports of technical data for the production of such equipment. The equipment and technical data subject to this validated licensing requirement have diverse civil applications and, this, are not uniquely related to chemical and biological weapons production.

The validated licensing requirement for this equipment and technical data applies only to exports and reexports to Country Groups S and Z and the regions and countries listed in new Supplement No. 5 to part 778 of the EAR. Supplement No. 5 includes the Middle Eastern and Southwest Asian regions and certain other countries.

Section 776.20 establishes the licensing policy for reviewing applications to export or reexport equipment and the technical data related to chemical and biological weapons production. Exports and reexports of such items will be denied if they would make a material contribution to the design, development, production, stockpiling, or use of chemical or biological weapons.

This rule implements part of Executive Order 12735 of November 16, 1990, on Chemical and Biological Weapons Proliferation, as well as the Enhanced Proliferation Control Initiative (EPCI) announced on December 13, 1990. Excutive Order 12735 of November 16, 1990, directs the Secretary of Commerce to control exports that the Secretary of Commerce and the Secretary of State determine would assist a country in acquiring chemical and biological weapons capability. The EPCI directs Commerce to control dual-use equipment and technical data related to chemical and biological weapons. This rule creates new Export Control Commodity Numbers (ECCNs) in the CCL to control this equipment to Country Groups S and Z and the regions and countries listed in new Supplement 5 to part 778.

The following ECCNs are added to the CCL:

5129F: Chemical processing equipment linked with nickel or constructed of Hastelloy, Monel, or another alloy with nickel content.

5132F: Pumps or valves designed to be vapor leak proof.

5133F: Thermometers or other chemical processing sensors encased in nickel alloy.

5134F: Filling equipment enclosed in a glove box or similar environmental barrier, or incorporating a nickel-lined or Hastelloy nozzle.

5135F: Specially designed incinerators for chemical precursors listed in ECCN 4798B, chemical warfare agents, or organophosphorus compounds.

5140F: Toxic gas monitoring systems.

5141F: Monitoring systems for the detection of chemical compounds having anticholinesterase activity.

5165F: Detection or assay systems for biological agents.

5187F: Biohazard containment equipment.

5170F: Equipment for the microencapsulation of live microorganisms.

5797F: Intermediate chemicals used in the production of chemical warfare agents.

5897F: Complex media for the growth of microorganisms.

The United States will seek the agreement of all Australia Group governments to adopt equivalent controls on this equipment. The twenty-member Australia Group, in which the United States participates, seeks to prevent the proliferation of chemical and biological weapons.

The Department of Commerce has submitted a report to the Congress in accordance with section 6 of the Export Administration Act of 1979, as amended, to support this imposition of U.S. foreign policy controls.

The contract sanctity provision contained in this rule is consistent with the requirements of the Export Administration Act of 1979, as amended (EAA). However, serious consideration is being given to eliminating this contract sanctity provision when the final rule is published, in light of the serious concerns raised by chemical and biological weapons. The Department invites public comments on this issue, as

well as all other aspects of the regulation.

Consistent with the prohibitions on trade with Iraq and Kuwait contained in the Executive Orders issued on August 2 and 9, 1990, exporters should obtain guidance from the Office of Foreign Assets Control, U.S. Department of Treasury, concerning any export or reexport to Iraq or Kuwait.

Saving Clause

Shipments of items removed from general license authorizations as a result of this regulatory action that were on dock for loading, on lighter, laden aboard an exporting carrier, or en route aboard carrier to a port of export pursuant to actual orders for export before March 27, 1991, may be exported under the previous general license provisions up to and including April 10, 1991. Any such items not actually exported before midnight April 10, 1991, require a validated export license in accordance with this regulation.

Rulemaking Requirements

1. This rule is consistent with Executive Orders 12291 and 12661.

2. This rule involves collections of information subject to the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 *et seq.*). These collections have been approved by the Office of Management and Budget under control numbers 0694-0005 and 0694-0010.

3. This rule does not contain policies with Federalism implications sufficient to warrant preparation of a Federalism assessment under Executive Order 12612.

4. Because a notice of proposed rulemaking and an opportunity for public comment are not required to be given for this rule by section 553 of the Administrative Procedure Act (5 U.S.C. 553) or by any other law, under sections 603(a) and 604(a) of the Regulatory Flexibility Act (5 U.S.C. 603(a) and 604(a)) no initial or final Regulatory Flexibility Analysis has to be or will be prepared.

5. The provisions of the Administrative Procedure Act, 5 U.S.C. 553, requiring notice of proposed rulemaking, the opportunity for public participation, and a delay in effective date, are inapplicable because this regulation involves a foreign and military affairs function of the United States. No other law requires that a notice of proposed rulemaking and an opportunity for public comment be given for this rule.

However, because of the importance of the issues raised by these regulations, this rule is issued in interim form and comments will be considered in the development of final regulations. Accordingly, the Department encourages interested persons who wish to comment to do so at the earliest possible time to permit the fullest consideration of their views. Comments on the contract sanctity provision contained in this rule are especially encouraged.

The period for submission of comments will close April 12, 1991. The Department will consider all comments received before the close of the comment period in developing final regulations. Comments received after the end of the comment period will be considered if possible, but their consideration cannot be assured. The Department will not accept public comments accompanied by a request that a part or all of the material be treated confidentially because of its business proprietary nature or for any other reason. The Department will return such comments and materials to the person submitting the comments and will not consider them in the development of final regulations. All public comments on these regulations will be a matter of public record and will be available for public inspection and copying. In the interest of accuracy and completeness, the Department requires comments in written form. Oral comments must be followed by written memoranda, which will also be a matter of public record and will be available for public review and copying. Communications from agencies of the United States Government or foreign governments will not be made available for public inspection.

The public record concerning these regulations will be maintained in the Bureau of Export Administration Freedom of Information Records Inspection Facility, room 4525, Department of Commerce, 14th Street and Pennsylvania Avenue NW., Washington, DC 20230. Records in this facility, including written public comments and memoranda summarizing the substance of oral communications, may be inspected and copied in accordance with regulations published in part 4 of title 15 of the Code of Federal Regulations. Information about the inspection and copying of records at the facility may be obtained from Margaret Cornejo, Bureau of Export Administration Freedom of Information Officer, at the above address or by calling (202) 377-5653.

List of Subjects

15 CFR Part 770

Administrative practice and procedure, Exports.

15 CFR Parts 776 and 799

Exports, Reporting and recordkeeping requirements.

15 CFR Part 778

Exports, Nuclear energy, Reporting and recordkeeping requirements.

Accordingly, parts 770, 776, 778, and 799 of the Export Administration Regulations (15 CFR parts 730-799) are amended as follows:

1. The authority citation for 15 CFR parts 770, 776 and 778 is revised to read as follows:

Authority: Public Law 96-72, 93 Stat. 503 (50 U.S.C. app. 2401 *et seq.*), as amended; Public Law 96-223, 91 Stat. 1626 (50 U.S.C. 1701 *et seq.*); Public Law 95-242, 92 Stat. 141 (42 U.S.C. 2139(a)); E.O. 12730 of September 30, 1990 (55 FR 40373, October 2, 1990); and E.O. 12735 of November 16, 1990 (55 FR 48587, November 20, 1990).

2. The authority citation for 15 CFR part 799 is revised to read as follows:

Authority: Public Law 96-72, 93 Stat. 503 (50 U.S.C. app 2401 *et seq.*), as amended; Public Law 96-223, 91 Stat. 1626 (50 U.S.C. 1701 *et seq.*); E.O. 12730 of September 30, 1990 (55 FR 40373, October 2, 1990); and E.O. 12735 of November 16, 1990 (55 FR 48587, November 20, 1990).

PART 770—[AMENDED]

3. Section 770.2 is amended by adding alphabetically a definition for "Middle East" a definition for "Southwest Asia" to read as follows:

§ 770.2 Definitions of terms.

• • • • •

Middle East. Geographically, this region is understood to include Bahrain, Egypt, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Oman, Qatar, Saudi Arabia, Syria, United Arab Emirates, and Yemen.

• • • • •

Southwest Asia. Geographically, this region is understood to include Afghanistan, India, Iran, and Pakistan.

• • • • •

PART 776—[AMENDED]

4. Part 776 is amended by adding a new § 776.20 to read as follows:

§ 776.20 Equipment and technical data related to the production of chemicals and biological agents.

(a) The following controls on equipment and technical data related to the production of chemicals and biological agents are maintained in support of the U.S. foreign policy of opposing the proliferation and illegal use of chemical and biological weapons:

(1) Equipment identified in ECCNs 5129F, 5132F, 5133F, 5134F, 5135F, 5140F, and 5141F in the Commodity Control List, which can be used in the production of chemical weapons precursors and chemical warfare agents, requires a validated license for export from the United States to Country Groups S and Z and countries listed in Supplement No. 5 to part 778 of this subchapter.

(2) Equipment and materials identified in ECCNs 5165F, 5167F, 5170F, 5797F, and 5997F, which can be used in the production of biological agents, require a validated license for export from the United States to Country Groups S and Z and countries listed in Supplement No. 5 to part 778 of this subchapter.

(3) Technical data for the production of commodities described in paragraphs (a)(1) and (a)(2) of this section are not eligible for General License GTDR if destined for a country listed in Supplement No. 5 to part 778 of this subchapter.

(b) *Licensing policy.* (1) Unless the criteria stated in paragraph (b)(3) of this section are met, applications to export the commodities and technical data described in paragraph (a) of this section will be considered on a case-by-case basis to determine whether the export would make a material contribution to the design, development, production, stockpiling, or use of chemical or biological weapons. When an export is deemed to make such a contribution, the license will be denied.

(2) The following factors are among those that will be considered to determine what action should be taken on individual applications:

(i) The specific nature of the end-use;

(ii) The significance of the export in terms of its contribution to the design, development, production, stockpiling, or use of chemical or biological weapons;

(iii) The non-proliferation credentials of the importing country; and

(iv) The types of assurances or guarantees against the design, development, production, stockpiling, or use of chemical or biological weapons that are given in a particular case.

(3) The contract sanctity date for the commodities and technical data described in paragraph (a) of this section is March 7, 1991.

PART 778—[AMENDED]

5. Part 778 is amended by adding a new Supplement No. 5 to read as follows:

Supplement No. 5—Dual-use Chemical and Biological Equipment; Regions, Countries, and Other Destinations

Bulgaria
China (People's Republic of)
Cuba
Middle East [1]
Myanmar (Burma)
North Korea
Romania
South Africa
Southwest Asia [2]
Soviet Union
Taiwan
Vietnam

PART 799—[AMENDED]

Supplement No. 1 to § 799.1 [Amended]

6. In Supplement No. 1 to Section 799.1 (the Commodity Control List), Commodity Group 1 (Chemical and Petroleum Equipment), a new ECCN 5129F is added immediately following ECCN 4128B, as follows:

5129F Chemical processing equipment lined with nickel or constructed of Hastelloy, Monel, or another alloy with nickel content.

Controls for ECCN 5129F

Unit: Report in "number".

Validated License Required: Country Groups S and Z and countries listed in Supplement No. 5 to part 778 of this subchapter.

GLV $ Value Limit: $0 for all destinations.

Processing Code: TE.

Reason for Control: Foreign policy.

Special Licenses Available: None.

List of Equipment Controlled by ECCN 5129F

Any of the following types of chemical processing equipment lined with nickel or constructed of Hastelloy, Monel, or another alloy with a nickel content in excess of 40% by weight, as follows:

(a) Reactor vessels with a capacity greater than 5 liters;

(b) Storage tanks and containers with a capacity greater than 10 liters;

(c) Heat exchangers;

(d) Distillation columns with a capacity greater than 2 liters per hour;

(e) Degassing equipment or condensers.

7. In Supplement No. 1 to section 799.1 (the Commodity Control List), Commodity Group 1 (Chemical and Petroleum Equipment), a new ECCN 5132F is added immediately following ECCN 3131A, as follows:

5132F Pumps or valves designed to be vapor leak proof.

Controls for ECCN 5132F

Unit: Report in "number".

[1] See § 770.2 of this subchapter for definition.

[2] See footnote 1.

Validated License Required: Country Groups S and Z and countries listed in Supplement No. 5 to part 778 of this subchapter.

GLV $ Value Limit: $0 for all destinations.

Processing Code: TE.

Reason for Control: Foreign policy.

Special Licenses Available: None.

List of Equipment Controlled by ECCN 5132F

Pumps or valves having any of the following characteristics:

(a) Incorporating a body made from alloy with a nickel content in excess of 40% by weight;

(b) Lined with nickel; or

(c) Otherwise designed to be vapor leak proof.

Note: This ECCN 5132F controls double seal, electromagnetic drive, or canned pumps, and bellows or diaphragm valves, having any of the characteristics described in paragraphs (a) through (c) of the List of Equipment Controlled.

8. In Supplement No. 1 to § 799.1 (the Commodity Control List), Commodity Group 1 (Chemical and Petroleum Equipment), a new ECCN 5133F is added immediately following ECCN 5132F, as follows:

5133F Thermometers or other chemical process sensors encased in nickel alloy having a nickel content greater than 40%.

Controls for ECCN 5133F

Unit: Report in "number".

Validated License Required: Country Groups S and Z and countries listed in Supplement No. 5 to part 778 of this subchapter.

GLV $ Value Limit: $0 for all destinations.

Processing Code: TE.

Reason for Control: Foreign policy.

Special Licenses Available: None.

9. In Supplement No. 1 to § 799.1 (the Commodity Control List), Commodity Group 1 (Chemical and Petroleum Equipment), a new ECCN 5134F is added immediately following ECCN 5133F, as follows:

5134F Filling equipment enclosed in a glove box or similar environmental barrier, or incorporating a nickel-lined or Hastelloy nozzle.

Controls for ECCN 5134F

Unit: Report in "number".

Validated License Required: Country Groups S and Z countries listed in Supplement No. 5 to part 778 of this subchapter.

GLV $ Value Limit: $0 for all destinations.

Processing Code: TE.

Reason for Control: Foreign policy.
Special Licenses Available: None.

10. In Supplement No. 1 to § 799.1 (the Commodity Control List), Commodity Group 1 (Chemical and Petroleum Equipment), a new ECCN 5135F is added immediately following ECCN 5134F, as follows:

5135F Specially designed incinerators for chemical precursors listed in ECCN 4796B, chemical warfare agents, or organophosphorus compounds.

Controls for ECCN 5135F

Unit: Report in "number".
Validated License Required: Country Groups S and Z countries listed in Supplement No. 5 to part 778 of this subchapter.
GLV $ Value Limit: $0 for all destinations.
Processing Code: TE.
Reason for Control: Foreign policy.
Special Licenses Available: None.

11. In Supplement No. 1 to § 799.1 (the Commodity Control List), Commodity Group 1 (Chemical and Petroleum Equipment), a new ECCN 5140F is added immediately following ECCN 5135F, as follows:

5140F Toxic gas monitoring systems.

Controls for ECCN 5140F

Unit: Report in "number".
Validated License Required: Country Groups S and Z countries listed in Supplement No. 5 to part 778 of this subchapter.
GLV $ Value Limit: $0 for all destinations.
Processing Code: TE.
Reason for Control: Foreign policy.
Special Licenses Available: None.

List of Equipment Controlled by ECCN 5140F

Toxic gas monitoring systems designed to detect phosphorus, sulphur, or fluorine compounds, or designed to detect any chemical weapons precursor or chemical warfare agent, that are:

(a) Designed for continuous operation; and

(b) Capable of detecting such chemicals at a concentration less than 0.1 milligrams per cubic meter of air.

12. In Supplement No. 1 to § 799.1 (the Commodity Control List), Commodity Group 1 (Chemical and Petroleum Equipment), a new ECCN 5141F is added immediately following ECCN 5141F, as follows:

5141F Monitoring systems for the detection of chemical compounds having anticholinesterase activity.

Controls for ECCN 5141F

Unit: Report in "number"
Validated License Required: Country Groups S and Z countries listed in Supplement No. 5 to part 778 of this subchapter.
GLV $ Value Limit: $0 for all destinations.
Processing Code: TE.
Reason for Control: Foreign policy.
Special Licenses Available: None.

13. In Supplement No. 1 to § 799.1 (the Commodity Control List), Commodity Group 1 (Chemical and Petroleum Equipment), a new ECCN 5165F is added immediately following ECCN 1145F, as follows:

5165F Detection or assay systems that are capable of detecting concentrations of less than one part per million in air of biological agents or toxins controlled by ECCN 4997B or ECCN 4998B.

Controls for ECCN 5165F

Unit: Report in "number".
Validated License Required: Country Groups S and Z and countries listed in Supplement No. 5 to part 778 of this subchapter.
GLV $ Value Limit: $0 for all destinations.
Processing Code: TE.
Reason for Control: Foreign policy.
Special Licenses Available: None.

14. In Supplement No. 1 to § 799.1 (the Commodity Control List), Commodity Group 1 (Chemical and Petroleum Equipment), a new ECCN 5167F is added immediately following ECCN 5165F, as follows:

5167F Biohazard containment equipment.

Controls for ECCN 5167F

Unit: Report in "number".
Validated License Required: Country Groups S and Z and countries listed in Supplement No. 5 to part 778 of this subchapter.
GLV $ Value Limit: $0 for all destinations.
Processing Code: TE.
Reason for Control: Foreign policy.
Special Licenses Available: None.

List of Equipment Controlled Under ECCN 5167F

Biohazard containment equipment, as follows:

(a) Complete P3 or P4 level laboratory facilities;

(b) Equipment that incorporates or is contained in a P-3 or P-4 containment housing.

15. In Supplement No. 1 to § 799.1 (the Commodity Control List), Commodity Group 1 (Chemical and Petroleum Equipment), a new ECCN 5170F is added immediately following ECCN 5167F, as follows:

5170F Equipment for the microencapsulation of live microorganisms.

Controls for ECCN 5170F

Unit: Report in "number".
Validated License Required: Country Groups S and Z and countries listed in Supplement No. 5 to part 778 of this subchapter.
GLV $ Value Limit: $0 for all destinations.
Processing Code: TE.
Reason for Control: Foreign policy.
Special Licenses Available: None.

16. In Supplement No. 1 to section 799.1 (the Commodity Control List), Commodity Group 7 (Chemicals, Metalloids, Petroleum Products and Related Materials), a new ECCN 5797F is added immediately following ECCN 4784B, as follows:

5797F Intermediate chemicals used in the production of chemical warfare agents.

Controls for ECCN 5797F

Unit: Report in "$ value".
Validated License Required: Country Groups S and Z and countries listed in Supplement No. 5 to part 778 of this subchapter.
GLV $ Value Limit: $0 for all destinations.
Processing Code: TE.
Reason for Control: Foreign policy.
Special Licenses Available: None.

List of Chemicals Controlled by ECCN 5797F

(a) (C.A.S. #693-13-0) Di-isopropylcarbodiimide;

(b) (C.A.S. #538-75-0) Di-cyclohexocarbodiimide.

17. In Supplement No. 1 to § 799.1 (the Commodity Control List), Commodity Group 9 (miscellaneous), a new ECCN 5997F is added immediately following ECCN 4997B, as follows:

5997F Complex media (specifically brain/heart infusion media) for the growth of microorganisms in Class 3 or Class 4, in quantities greater than 100 kilograms.

Controls for ECCN 5997F

Unit: Report in "number".
Validated License Required: Country Groups S and Z and countries listed in Supplement No. 5 to part 778 of this subchapter.
GLV $ Value Limit: $0 for all destinations.
Processing Code: TE.
Reason for Control: Foreign policy.
Special Licenses Available: None.

Dated: March 7, [illegible].

[illegible],

Deputy Assistant Secretary for Export Administration.

[FR Doc. 91-5880 Filed [illegible]]

[illegible]

DEPARTMENT OF COMMERCE

Bureau of Export Administration

15 CFR Parts 771, 776, and 778

[Docket No. 910249-1049]

Imposition and Expansion of Foreign Policy Controls

AGENCY: Bureau of Export Administration, Commerce.

ACTION: Proposed rule and request for public comment.

SUMMARY: The Department of Commerce is proposing to amend the Export Administration Regulations (EAR) in support of U.S. non-proliferation policies. This proposal would impose foreign policy controls on certain exports by providing authority to deny items that already require a validated license, for any reason other than short supply, where the export is determined to be for a facility involved in the design, development, production, or use of missiles or chemical or biological weapons.

This proposal would also impose foreign policy controls on exports to specified destinations when the exporter knows, or to any destination when the exporter is informed by the Office of Export Licensing (OEL), that the commodities, technical data, or software will be used in the design, development, production or use of missiles or of chemical or biological weapons, or are destined for a facility engaged in such activities.

In addition, this proposal would impose foreign policy controls on exports to specified destinations when a U.S. person knows, or to any destination when the U.S. person is informed by OEL, that the commodities, technical data, or software will be used in the design, development, production, or use of missiles or chemical or biological weapons, or are destined for a facility engaged in such activities. Neither may a U.S. person, without a validated license, perform any contract, service, or employment knowing that it assists such activities.

This proposal would also impose foreign policy controls on participation and support by U.S. persons in the design, development, production, or use of missiles or of chemical or biological weapons.

This proposal would restrict participation by U.S. persons in construction of whole plants to produce chemical weapon precursors in certain countries.

This proposal would also make changes in the organization of regulations relating to weapons proliferation, grouping them in newly designated part 778, Proliferation Controls.

DATES: Comments must be received by April 12, 1991.

ADDRESSES: Written comments (six copies) should be sent to: Patricia Muldonian, Office of Technology and Policy Analysis, Bureau of Export Administration, Department of Commerce, Washington, DC 20230.

FOR FURTHER INFORMATION CONTACT: Kathryn Sullivan, Bureau of Export Administration, Telephone: (202) 377-8760.

SUPPLEMENTARY INFORMATION:

Background

The Department of Commerce, in consultation with the Department of State, has decided to propose expanding foreign policy controls in several ways in support of U.S. non-proliferation policies.

One proposed EAR change would provide authority to deny a license for exports of items that already require a validated license, for any reason other than short supply, where the export could be destined for the design, development, production, or use of missiles or chemical or biological weapons, or for a facility engaged in such activities.

The proposed rule would also impose foreign policy controls on exports to specified destinations when the exporter knows the export will be used in the design, development, production, stockpiling, or use of missiles or of chemical or biological weapons, or is destined for a facility engaged in such activities.

The rule does not provide a proposed definition of the term "know". However, consideration is being given to whether such a definition is advisable. The following definition is under consideration for inclusion in the final rule, and comments on the need for and wording of a definition are especially encouraged.

Know. Except as the term is used in part 769, a person shall be considered to know a circumstance or result when that person:

(a) Is aware that such circumstance exists, or that such result is substantially certain to occur; or

(b) Has a firm belief that such circumstance exists, or that such result is substantially certain to occur.

A person knows of the existence of a particular circumstance if that person is aware of a high probability of the existence of such circumstance, unless the person actually believes that such circumstance does not exist.

In addition, the proposed rule would amend the EAR to make clear that the Office of Export Licensing may inform an exporter at any time that a validated license is required for a specific export or reexport transaction or for exports or reexports to a specific end-user or end-use because of an unacceptable risk that such shipments will be used in sensitive nuclear activities, in the design, development, production, stockpiling, or use of chemical or biological weapons, or in the design, development, production or use of missiles. An exporter or reexporter may be individually informed by OEL, or notice may be published in the Federal Register. This proposal would provide new supplements to the EAR to identify regions and countries, as well as facilities and projects, to which certain validated license requirements apply.

Also, the proposed rule would substitute the term "missiles" for the current "missiles capable of delivering nuclear weapons". The definition of such missiles, as contained in the EAR, is not affected by this change.

Also, the proposed rule would add a new provision to the EAR to restrict participation by U.S. persons in missile, chemical weapons, or biological weapons development. No U.S. person may knowingly export or reexport to specified destinations commodities, software, or technical data, regardless of origin, for use in the design, development, production, stockpiling, or use of chemical or biological weapons, or of missiles, or to a facility engaged in such activities. Nor may a U.S. person, without a validated license, perform any contract, service, or employment knowing that it assists such activities. When a U.S. person has been informed by OEL, these prohibitions apply to any destination. In addition, the rule restricts participation and support by U.S. persons in the design, construction, or export of whole plants to make precursors for chemical weapons. This prohibition also extends to support of any such transactions, through financing, freight forwarding, or other comparable activities. The term "U.S. person" is defined for the purposes of these provisions to include foreign branches of companies organized in the United States.

In amending the Export Administration Act of 1979 in 1985, the Congress added section 6(m), which prohibited the President from restricting transactions in performance of a contract entered into before the date of a report to Congress of the intent to

impose a foreign policy control. The effect of that provision has been to require approval of export license applications when a contract predates the control program, unless denial is based on some other control provision of the EAR. While contract sanctity is provided in this proposal, serious consideration is being given to eliminating these contract sanctity provisions when the final rule is published, in light of the serious concerns raised by missiles or chemical or biological weapons. The Department invites public comments on this issue, as well as all other aspects of the regulation.

Consistent with the prohibitions on trade with Iraq and Kuwait contained in the Executive Orders issued on August 2 and 9, 1990, exporters should obtain guidance from the U.S. Department of Treasury, Office of Foreign Assets Control concerning any export or reexport to Iraq or Kuwait.

On March 7, 1991, the Department submitted a report notifying the Congress of its intent to impose these controls. To provide contract sanctity, export licenses may be issued on a case-by-case basis for the export of commodities, software, or technical data subject to these new controls in performance of a contract or an agreement entered into before March 7, 1991 (the date of notification to Congress of intent to impose these controls).

Rulemaking Requirements and Invitation to Comment

1. This rule is consistent with Executive Orders 12291 and 12661.

2. This rule involves collections of information subject to the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 *et seq.*). These collections have been approved by the Office of Management and Budget under control numbers 0694-0005 and 0694-0010.

3. This rule does not contain policies with Federalism implications sufficient to warrant preparation of a Federalism assessment under Executive Order 12612.

4. Because a notice of proposed rulemaking and an opportunity for public comment are not required to be given for this rule by section 553 of the Administrative Procedure Act (5 U.S.C. 553), or by any other law, under sections 603(a) and 604(a) of the Regulatory Flexibility Act (5 U.S.C. 603(a) and 604(a)) no initial or final Regulatory Flexibility Analysis has to be or will be prepared.

5. The provisions of the Administrative Procedure Act, 5 U.S.C. 553, requiring notice of proposed rulemaking, the opportunity for public participation, and a delay in effective date, are inapplicable because this regulation involves a foreign and military affairs function of the United States. The Secretary of Commerce has submitted a report to Congress on the need for these controls. No other law requires that a notice of proposed rulemaking and an opportunity for public comment be given for this rule.

However, because of the importance of the issues raised by these regulations, this rule is being issued in proposed form and comments will be considered in the development of final regulations. Accordingly, the Department encourages interested persons who wish to comment to do so at the earliest possible time to permit the fullest consideration of their views. Comments on the suggested definition of "know" and on the contract sanctity provisions contained in this rule are especially encouraged.

The period for submission of comments will close (April 12, 1991.). The Department will consider all comments received before the close of the comment period in developing final regulations. Comments received after the end of the comment period will be considered if possible, but their consideration cannot be assured. The Department will not accept public comments accompanied by a request that part or all of the material be treated confidentially because of its business proprietary nature or for any other reason. The Department will return such comments and will not consider them in the development of final regulations. All public comments on these regulations will be a matter of public record and will be available for public inspection and copying. In the interest of accuracy and completeness, the Department requires comments in written form. Oral comments must be followed by written memoranda, which will also be a matter of public record and will be available for public review and copying. Communications from agencies of the United States Government or foreign governments will not be made available for public inspection.

The public record concerning these regulations will be maintained in the Bureau of Export Administration Freedom of Information Records Inspection Facility, room 4518, Department of Commerce, 14th Street and Pennsylvania Avenue, NW., Washington, DC 20230. Records in this facility, including written public comments and memoranda summarizing the substance of oral communications, may be inspected and copied in accordance with regulations published in part 4 of title 15 of the Code of Federal Regulations. Information about the inspection and copying of records at the facility may be obtained from Margaret Cornejo, Bureau of Export Administration Freedom of Information Officer, at the above address or by calling (202) 377-2593.

List of Subjects

15 CFR Parts 771 and 778

Exports, Reporting and recordkeeping requirements.

15 CFR Part 778

Exports, Nuclear energy, Reporting and recordkeeping requirements.

Accordingly, parts 771, 778, and 778 of the Export Administration Regulations (15 CFR parts 730-799) are amended as follows:

1. The authority citations for parts 771, and 778 are revised to read as follows:

Authority: Public Law 96-72, 93 Stat. 503 (50 U.S.C. app. 2401 *et seq.*), as amended; Public Law 95-223, 91 Stat. 1626 (50 U.S.C. 1701 *et seq.*); Executive Order 12730 of September 30, 1990 (55 FR 40373, October 2, 1990); Executive Order 12735 of November 16, 1990 (55 FR 48587, November 20, 1990).

2. The authority citation for part 778 is revised to read as follows:

Authority: Public Law 96-72, 93 Stat. 503 (50 U.S.C. app. 2401 *et seq.*), as amended; Public Law 95-223, 91 Stat. 1626 (50 U.S.C. 1701 *et seq.*); Public Law 95-242, 92 Stat. 141 (42 U.S.C. 2139a(a)); Executive Order 12730 of September 30, 1990 (55 FR 40373, October 2, 1990); and Executive Order 12735 of November 16, 1990 (55 FR 48587, November 20, 1990).

PART 771—AMENDED

3. Section 771.2(c) is amended by removing the word "or" at the end of paragraphs (c)(11) and (c)(12), and by adding new paragraphs (c)(13) and (c)(14) to read as follows:

§ 771.2 General provisions.

* * * * *

(c) * * *

(13) The exporter either:

(i) Knows that the commodity, software or technical data:

(A) Are destined for any facility or project listed in Supplement No. 7 to part 778 of this subchapter; or

(B) Will be used in the design, development, production, or use of missiles in or by a country where a facility or project listed in Supplement No. 7 to part 778 of this subchapter is located; or

(ii) Is informed by OEL that a validated license is required for export to a consignee, wherever located,

because the export may apply to the design, development, production, or use of missiles;

(14) The exporter either:

(i) Knows that the commodity, software or technical data:

(A) Are destined for any facility listed in Supplement No. 6 to part 778 of this subchapter; or

(B) Will be used in the design, development, production, stockpiling, or use of chemical or biological weapons in or by a country listed in Supplement No. 5 to part 788; or

(ii) Is informed by OEL that a validated license is required for export to a consignee, wherever located, because the export may apply to the design, development, production, stockpiling, or use of chemical or biological weapons.

* * * * *

PART 776—AMENDED

4. Part 776 is amended by removing §§ 776.18, 776.19, and 776.20.

5. The heading to part 778 is revised to read as follows:

PART 778—PROLIFERATION CONTROLS

6. Section 778.1 is revised to read as follows:

§ 778.1 Purpose.

(a) *Scope.* This part defines the types of transactions that are governed by the U.S. policy concerning the non-proliferation of chemical and biological weapons, nuclear weapons or explosive devices, missile systems and the U.S. maritime nuclear propulsion policy. The controls implement policies set out in section 3(2) (A) and (B) of the Export Administration Act and section 309(c) of the Nuclear Non-Proliferation Act of 1978 (Pub. L. 95-242), that is:

(1) To exercise the necessary vigilance from the standpoint of their significance to the national security of the United States;

(2) To further significantly the foreign policy of the United States or to fulfill its international responsibilities; and

(3) To maintain controls over items because of their potential significance for nuclear explosive purposes.

(b) *Related legislation.* These controls supplement those exercised by the Nuclear Regulatory Commission and the Department of Energy under the Atomic Energy Act of 1954, as amended by the Nuclear Non-Proliferation Act of 1978 and other statutes, and by the Office of Defense Trade Controls, Department of State, under the Arms Export Control Act of 1976. (See §770.10 of this subchapter.)

§ 778.2 [Amended]

7. In § 778.2 paragraph (a) is amended by removing the last two sentences.

8. Section 778.3 is amended by adding two new sentences at the end of the introductory text to read as follows:

§ 778.3 Additional validated license requirements for exports with certain nuclear end-uses.

* * * When the Office of Export Licensing determines that there is an unacceptable risk of use in or diversion to such activities, it may inform the exporter, either individually or through amendment to the regulations in this subchapter, that an individual validated license is required. However, the absence of any such notification does not excuse the exporter from compliance with the validated license requirements of this section.

* * * * *

9. A new § 778.6 is added to read as follows:

§ 778.6 Preparing nuclear-related application.

An application for a license to export commodities or technical data subject to provisions of § 778.2, § 778.3, or § 778.5 shall be prepared and submitted on Form BXA-622P, Application for Export License, in accordance with instructions set forth in §§ 772.5 and 779.5(e) of this subchapter with the following additional instructions:

(a) *Identification of License Application.* Enter the words "NUCLEAR CONTROLS" in Item 4, "Special Purpose," of Form BXA-622P.

(b) *Consignee in country of ultimate destination.* If the consignee in the country of ultimate destination is not the end-user of the commodities give the name and address of the end-user in Item 12, "Special End-Use," or on an attachment to the application, and if known, the specific geographic locations of any installations, establishments, or sites at which the commodities will be used.

(c) *Commodity description.* (1) If the CCL entry in question is divided into sub-entries, indicate the specific sub-entry that describes the commodity. In addition, specifications or descriptive brochures should be provided when available.

(2) If applicable, include a description of any specific features of design or specific modifications that make the commodity capable of the uses described in § 778.1.

(d) *End-use.* (1) A vague or general end-use description will delay review of an application. Applications indicating resale as the end-use sometimes must be returned without action in order to obtain more information.

(2) When submitting an application under § 778.1, fully explain the basis for the knowledge or belief that the commodities are intended for the purpose(s) described therein. Additionally, indicate, if possible, the specific end-use(s) the commodities will have in the designing, developing, fabricating, or testing nuclear weapons or nuclear explosive devices or in the designing, constructing, fabricating, or operating the facilities described in § 778.3.

10. Sections 778.7 and 778.8 are revised to read as follows:

§ 778.7 Equipment and related technical data used in the design, development, production, or use of missiles.

(a) *Validated license requirements.* In support of U.S. foreign policy to limit the proliferation of missiles, an individual validated license is required to export certain commodities, software, and technical data related to the design, development, production, or use of such missiles to Country Groups QSTVWYZ.

(1) *Commodities subject to weapons delivery systems controls.* The commodities that require a validated license because they are subject to foreign policy controls on weapons delivery systems appear within ECCNs 2018A, 2116A, 4116B, 4302B, 1357A, 1361A, 1362A, 1385A, 1460A, 1485A, 1501A, 1516A, 1517A, 4516B, 1522A 1529A, 4529B, 1531A, 1533A, 1564A, 4564B, 1565A, 1568A, 4568A, 4587B, 1595A, 1715A, and 1746A. Exporters should consult the Reason for Control paragraph in each ECCN to determine the specific items subject to these foreign policy controls.

(2) *Technical data and software subject to weapons delivery systems controls.* Technical data and software that require a validated license because they are subject to foreign policy controls on nuclear weapons delivery systems are listed in paragraph (4) of Supplement No. 4 to part 779 of this subchapter.

(3) *Definition.* The term "missiles" is defined as rocket systems (including ballistic missile systems, space launch vehicles, and sounding rockets) and unmanned air vehicle systems (including cruise missile systems, target drones, and reconnaissance drones) capable of delivering at least 500 kilograms (kg) payload to a range of at least 300 kilometers (km).

(b) *Controls on other commodities, technical data, and software.* BXA will review license applications, in accordance with the licensing policy described in paragraph (d) of this section, for commodities, technical data, or software not described in paragraph (a) of this section that:

(1) Require a validated license for reasons other than short supply; and

(2) Could be destined for the design, development, production, or use of missiles, or for a facility engaged in such activities.

(c) *Additional validated license requirements based on end-uses related to the design, development, production, or use of missiles.* (1) In addition to the validated license requirements described in paragraph (a) and paragraph (b) of this section, a validated license is required to export any commodity, software, or technical data (excluding technical data exportable under the provisions of General License GTDA and commodities identified in ECCN 7599I or 7999I), when the exporter knows that the commodities, software, or technical data:

(i) Are destined for any facility or project listed in Supplement No. 7 to part 778; or

(ii) Will be used in the design, development, production or use of missiles in or by a country where a facility or project listed in Supplement No. 7 to part 778 is located.

(2) The Office of Export Licensing may inform the exporter, either individually or through amendment to these regulations, that an individual validated license is required because there is an unacceptable risk of use in or diversion to such activities, anywhere in the world. However, the absence of any such notification does not excuse the exporter from compliance with the validated license requirements of paragraph (c)(1) of this section. Those facilities, projects, companies, or government entities currently identified are listed in Supplement No. 7 to part 778.

(d) *Licensing policy.* (1) Unless the criteria stated in paragraphs (d)(3), (d)(4) or (d)(5) of this section are met, applications to export the commodities will be considered on a case-by-case basis to determine whether the export would make a material contribution to the proliferation of missiles. When an export is deemed to make such a contribution, the license will be denied.

(2) The following factors are among those that will be considered to determine what action should be taken on individual applications:

(i) The specific nature of the end-use;

(ii) The significance of the export in terms of its contribution to the design, development, production, or use of missiles;

(iii) The capabilities and objectives of the missile and space programs of the recipient country;

(iv) The non-proliferation credentials of the importing country; and

(v) The types of assurances or guarantees against design, development production or use, of missiles delivery purposes that are given in a particular case.

(3) Consistent with section 6(m) of the EAA, the following contract sanctity dates have been established:

(i) License applications involving contracts for batch mixers specified in ECCN 4116B that were entered into prior to January 19, 1990, will be considered on a case-by-case basis.

(ii) License applications for commodities, technical data, or software described only in paragraph (b) or (c) of this section that involve a contract entered into prior to March 7, 1991, will be considered on a case-by-case basis.

(iii) Applicants who wish a pre-existing contract to be considered in reviewing their license applications must submit documentation sufficient to establish the existence of a contract.

(e) Commodities and technical data described in paragraph (a) of this section are not eligible for special licenses.

§ 778.8 Chemical precursors and biological agents, and associated equipment and technical data.

(a) *Validated license requirements.* The following controls are maintained in support of the U.S. foreign policy of opposing the proliferation and illegal use of chemical and biological weapons:

(1) Chemicals identified in ECCN 4798B require a validated license for export from the United States to all destinations except Australia, Austria, Belgium, Canada, Denmark, the Federal Republic of Germany, France, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, the Neitherlands, New Zealand, Norway, Portugal, Spain, Switzerland, Turkey, and the United Kingdom.

(2) Equipment identified in EECNs 5129F, 5132F, 5133F, 5134F, 5135F, 5140F, and 5141F in the Commodity Control List, which can be used in the production of chemical weapons precursors and chemical warfare agents, requires a validated license for export from the United States to Country Groups S and Z and regions and countries listed in Supplement No. 5 to Part 778.

(3) Viruses and viroids identified in ECCN 4997B and bacteria, fungi, and protozoa identified in ECCN 4998B require a validated license to all destinations except Canada.

(4) Equipment and materials identified Regional Director, ECCNs 5165F, 5167F, 5170F, 5797F, and 5997F, which can be used in the production of biological agents, require a validated license for export from the United States to Country Groups S and Z and regions and countries listed in Supplement No. 5 to part 778.

(5) The following restrictions apply to use of General License GTDR:

(i) General License GTDR is not available for technical data for the production of chemical precursors described in paragraph (a)(1) of this section, except to Australia, Austria, Belgium, Canada, Denmark, the Federal Republic of Germany, France, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Switzerland, Turkey, and the United Kingdom;

(ii) General License GTDR is not available for the export of technical data for the production of commodities described in paragraphs (a)(2) and (a)(4), of this section to regions and countries listed in Supplement No. 5 to Part 778;

(iii) General License GTDR is not available for the export of technical data for the production of commodities described in paragraph (a)(3) of this section;

(iv) (A) General License GTDR is not available for technical data for facilities designed or intended to produce chemical weapons precusors controlled by ECCN 4798B on the CCL, involving the following:

(*1*) Overall plant design;

(*2*) Design, specification, or procurement of equipment;

(*3*) Supervision of construction, installation, or operation of complete plant or components thereof;

(*4*) Training of personnel;

(*5*) Consultation on specific problems involving such facilities.

(B) This prohibition on use of General License GTDR does not apply to exports to Australia, Austria, Belgium, Canada, Denmark, the Federal Republic of Germany, France, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Switzerland, Turkey, and the United Kingdom:

(v) General License GTDR is available only to Australia, Austria, Belgium, Canada, Denmark, the Federal Republic of Germany, France, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Switzerland, Turkey, and the United Kingdom, for software for process control that is specifically configured to control or initiate the production of chemical weapons precusors controlled by ECCN 4798B.

(b) *Controls on other commodities, technical data, and software.* BXA will

review license applications, in accordance with the licensing policy described in paragraph (d) of this section, for commodities, technical data, or software not described in paragraph (a) of the section that:

(1) Require a validated license for reasons other than short supply;

(2) Are destined to a country other than those listed in paragraph (a)(1) of this section; and

(3) Could be destined for the design, development, production, stockpiling, or use of chemical or biological weapons, or for a facility engaged in such activities.

(c) *Additional validated license requirements based on end-uses related to the design, development, production, stockpiling, or use of chemical or biological weapons.* (1) In additon to the validated license requirements described in paragraph (a) and paragraph (b) of this section, a validated license is required to export any commodity, software, or technical data excluding technical data exportable under the provisions of General License GTDA and commodities identified in ECCN 7599I or 7999I), when the exporter knows that the commodities, software, or technical data:

(i) Are destined for any facility listed in Supplement No. 6 to par 778; or

(ii) Will be used in the design, development, production, stockpiling, or use of chemical or biological weapons in or by a region or country listed in Supplement No. 5 to part 778.

(2) The Office of Export Licensing may inform the exporter, either individually or through amendment to these regulations, that an individual validated license is required because there is an unacceptable risk of use in or diversion to such activities, anywhere in the world. However, the absence of any such notification does not excuse the exporter from compliance with the validated license requirements of paragraph (c)(1) of this section. Those facilities currently identified are listed in Supplement No. 6 to part 778.

(d) *Licensing policy.* (1) Unless the criteria stated in paragraph (d)(3) of this section are met, applications to export the commodities and technical data subject to this policy will be considered on a case-by-case basis to determine whether the export would make a material contribution to the design, development, production, stockpiling, or use of chemical or biological weapons. When an export is deemed to make such a contribution, the license will be denied.

(2) The following factors are among those that will be considered to determine what action should be taken on individual applications:

(i) The specific nature of the end-use;

(ii) The significance of the export in terms of its contribution to the design, development, production, stockpiling, or use of chemical or biological weapons;

(iii) The non-proliferation credentials of the importing country; and

(iv) The types of assurances or guarantees against design, development, production, stockpiling, or use of chemical or biological weapons that are given in a particular case.

(3) *Contract sanctity.* Consistent with section 6(m) of the EAA, the following contract sanctity dates have been established.

(i) The contract sanctity date for exports to Syria of dimethyl methylphosphonate, methyl phosphonyldifluoride, phosphorous oxychloride, thiodiglycol, dimethylamine hydrochloride, dimethylamine, ethylene chlorohydrin (2-chloroethanol), and potassium fluoride is April 28, 1988.

(ii) The contract sanctity date for exports to Iran or Syria of dimethyl phosphite (dimethyl hydrogen phosphite), methyl phosphonyldichloride, 3-quinuclidinol, N,N-diisopropylaminoethane-2-thiol, N,N-diisopropylaminoethyl-2-chloride, 3-hydroxy-1-methylpiperidine, trimethyl phosphite, phosphorous trichloride, and thionyl chloride is July 6, 1987.

(iii) The contract sanctity date for exports to Iran or Syria of items in ECCNs 4997B and 4998B is February 22, 1989.

(iv) The contract sanctity date for exports to Iran of dimethyl methylphosphonate, methylphosphonyl dichloride, methylphosphonyl difluoride, phosphorous oxychloride, and thiodiglycol is February 22, 1989.

(v) The contract sanctity date for exports to Syria of dimethyl methylphosphonate, methylphosphonyl dichloride, and methylphosphonyl difluoride is February 22, 1989.

(vi) The contract sanctity date for exports to Iran, Libya, or Syria of potassium hydrogen fluoride, ammonium hydrogen fluoride, sodium fluoride, sodium bifluoride, phosphorus pentasulfide, sodium cyanide, triethanolamine, diisopropylamine, sodium sulfide, and N,N-diethylethanolamine is December 12, 1989.

(vii) The contract sanctity date for exports to all destinations (except Iran or Syria) of phosphorus trichloride, trimethyl phosphite, and thionyl chloride is December 12, 1989. For exports to Iran or Syria, paragraph (d)(3)(ii) of this section applies.

(viii) The contract sanctity date for exports to all destinations (except Iran, Libya, or Syria) of 2-chloroethanol and triethanolamine is January 15, 1991. For exports of 2-chloroethanol to Syria, paragraph (d)(3)(i) of this section applies. For exports of triethanolamine to Iran, Libya, or Syria, paragraph (d)(3)(vi) of this section applies.

(ix) The contract sanctity date for exports to all destinations (except Iran, Libya, or Syria) of chemicals controlled by ECCN 4798B is March 7, 1991, except for applications to export the following chemicals: 2-chloroethanol, dimethyl methylphosphonate, dimethyl phosphite (dimethyl hydrogen phosphite), methylphosphonyl dichloride, methylphosphonyl difluoride, phosphorous oxychloride, phosphorous trichloride, thiodiglycol, thionyl chloride, triethanolamine, and trimethyl phosphite. (See also paragraphs (d)(3)(vi) and (d)(3)(vii) of this section.) For exports to Iran, Libya, or Syria, see paragraphs (d)(3)(i) through (d)(3)(vi) of this section.

(x) The contract sanctity date for exports of the following commodities and technical data is March 7, 1991:

(A) equipment (for producing chemical weapon precursors and chemical warfare agents) described in paragraph (a)(2) of this section;

(B) Equipment and materials (for producing biological agents) described in paragraph (a)(4) of this section;

(C) Technical data described in paragraph (a)(5) of this section; and

(D) Commodities, technical data, or software described in paragraph (c) of this section.

(xi) The contract sanctity date for exports of commodities, technical data, or software described in paragraph (b) of this section is March 7, 1991.

(xii) The contract sanctity date for reexports of chemicals controlled under ECCN 4798B is March 7, 1991, except that the contract sanctity date for reexports of these chemicals to Iran, Libya, or Syria is December 12, 1989.

(xiii) The contract sanctity date for reexports of viruses and viroids identified under ECCN 4997B and bacteria fungi, and protozoa identified under ECCN 4998B is March 7, 1991.

(4) When preparing a license application for chemicals, applicants shall type the Chemical Abstract Service (C.A.S.) Registry number in Item 9(b) before each chemical name. The C.A.S. numbers are listed with the controlled chemicals in ECCN 4798B under the "List of Chemicals." See Supplement No. 1 to § 799.2 of this subchapter, Interpretation 23: Precursor Chemicals.

CONFERENCE ON DISARMAMENT

CD/1087
8 July 1991

Original: ENGLISH

LETTER DATED 8 JULY 1991 FROM THE DEPUTY REPRESENTATIVE OF THE UNITED STATES OF AMERICA ADDRESSED TO THE PRESIDENT OF THE CONFERENCE ON DISARMAMENT TRANSMITTING A STATEMENT DELIVERED ON 25 JUNE 1991, BY AMBASSADOR DAVID J. SMITH, CHIEF UNITED STATES NEGOTIATOR FOR THE DEFENSE AND SPACE TALKS, IN THE AD HOC COMMITTEE ON PREVENTION OF AN ARMS RACE IN OUTER SPACE OF THE CONFERENCE ON DISARMAMENT

I have the honour to forward to you the attached Statement to the Outer Space Committee of the Conference on Disarmament, delivered on 25 June 1991, by Ambassador David J. Smith, Chief United States Negotiator for the Defense and Space Talks.

I request that you take the appropriate steps to register this Statement as an official document of the Conference on Disarmament and to have it distributed to all member delegations and non-member States participating in the work of the Conference.

(Signed) M. Lyall Breckon
Deputy Representative of the
United States of America to
the Conference on Disarmament

GE.91-61689/0732H

Statement to the Outer Space Committee
of the Conference on Disarmament
25 June 1991

by

Ambassador David J. Smith
Chief United States Negotiator
for the Defense and Space Talks

Mr. Chairman,

I

When I last had the privilege of addressing the Conference on Disarmament on the status of the Defense and Space Talks, I began by stressing President George Bush's words of 7 February 1990: "In the 1990s, strategic defenses make more sense than ever before." I begin this way again today because so many of the events of the 16 months since those words were spoken have proven them all the more valid.

The President was speaking at the mid-point of a two-year review of the United States Strategic Defense Initiative (SDI) at a time when many rapid changes were occurring in the world. These changes diminished our concern over the possibility of a strategic first strike with ballistic missiles against the United States relative to our growing concern over ballistic missile proliferation and accidental or unauthorized launches. Therefore, in his 29 January 1991, State of the Union Address, President Bush ordered redirection of the SDI programme to "protection from limited ballistic missile strikes, whatever their source".

Though backed by two years of study which began long before anyone imagined there would be a Persian Gulf War, the President's announcement could not be heard but through the thunder of the War. From that perspective, the results of our study and the President's decision were prescient.

President Bush recently summed it all up in a few sentences addressed to the graduating class of the United States Air Force Academy on 29 May 1991:

> "We learned that missile defense works and that it promotes peace and security. In the Gulf we had the technologies of defense to pick up where theories of deterrence left off. The Patriot saved lives and helped keep the coalition together.
>
> And while the Patriot worked well in the Gulf, we must prepare for the missiles more likely to be used by future aggressors. We cannot build a defense system that simply responds to the threats of the past."

II

Despite the overwhelming military force marshalled to enforce United Nations resolutions, notions of deterrence prevented neither the tragic war in the Gulf from starting nor ballistic missiles from being launched. SCUD missiles were fired in the opening days of conflict and targeted at civilian populations. Patriot interceptors defended troops and civilians, and greatly lessened the political terror that the SCUD attacks were designed to spread. The Patriot proved instrumental in containing the conflict, maintaining the international coalition, and possibly shortening the war. And let us not forget the most simple and important fact: the Patriot saved lives.

Yet, had these SCUD missiles been mated with chemical or nuclear warheads, the short-range Patriots could not have intercepted their targets far enough from civilian populations to provide the necessary defence. Far greater human tragedy would have occurred. Further, the SCUD is an old ballistic missile; far more capable missiles have already been developed.

The Patriot originally was designed as a point air defence weapon; it does not have the range, speed and manoeuvrability to intercept more capable, advanced types of ballistic missiles. Its success proved that defensive technology is feasible, but advanced interceptors, much more capable than the Patriot, are required to meet future crises that will involve ever more advanced missile threats.

According to the Secretary of Defense Dick Cheney, by the year 2000, in addition to the United States and Soviet Union, more than two dozen countries will have ballistic missiles; 15 of these countries will have the technical capabilities to produce their own missiles; half of these countries will have, or will be developing, nuclear capability. By 2000, 30 countries will have chemical weapons; 10 will be able to field biological weapons. Many of these countries will have ballistic missiles of various ranges; a few could achieve strategic range. In addition, as we saw in the Gulf War, ballistic missiles can be improved to add to their ranges and capabilities.

Such an environment can only be met with a broad, comprehensive strategy which includes political and diplomatic measures as well as defences. The United States is dedicated to strengthening and expanding the Missile Technology Control Regime and the Non-Proliferation Treaty, supporting the work of the Australia Group and advancing President Bush's Middle East arms control proposal. With dedication from all of us, we can expect to build upon the successes these efforts have already achieved. Still, experience and common sense suggest that these efforts alone cannot stop all proliferation. The introduction of modest, effective defences will complement the MTCR and other diplomatic efforts to deter missile proliferation.

III

America's new approach to ballistic missile defence, announced by President Bush on 29 January, is called Global Protection Against Limited Strikes (GPALS). Half the size of the original SDI "Phase I" plan, the GPALS architecture shifts the focus of strategic ballistic missile defence away from deterrence of a strategic ballistic missile attack to protection against the emerging and limited ballistic missile threat. Because it is limited in scope and scale, GPALS will not threaten the Soviet strategic retaliatory capability, an oft-stated Soviet concern over SDI. Therefore, given improving United States-Soviet relations and growing concern for ballistic missile proliferation and accidental and unauthorized launch, GPALS represents an appropriate approach to defences based on the evolving international environment.

A GPALS defence would include various sensors and three ground- and space-based interceptors to ensure global coverage against missiles of all ranges:

- Space- and surface-based sensors to provide global, continuous surveillance and tracking, from launch to intercept, of ballistic missiles of all ranges - theatre to strategic. This is a crucial element for a successful global defence.

- Surface-based, non-nuclear, transportable, kinetic interceptors to protect United States forces deployed abroad and United States allies and friends against ballistic missiles of theatre range.

- Space-based, non-nuclear, kinetic interceptors to provide continuous, global interception capability against missiles with ranges in excess of 500-1,000 km (300-600 miles). Thus, the space-based element will protect the United States, allies and friends against both theatre and strategic missiles and will provide the broadest, most effective global coverage.

- Finally, surface-based, non-nuclear, kinetic interceptors located in the United States to protect the United States from ballistic missiles of all ranges.

IV

Any meaningful deployment of ballistic missile defences will require a change in the legal regime established by the ABM Treaty. Therefore, although the world has changed, and our Program adjusted accordingly, our goal in the Defense and Space Talks remains consistent. We seek to negotiate a cooperative transition to allow increased reliance on strategic ballistic missile defences.

Over the six year history of our Talks, we have explained to our Soviet colleagues that, despite the best of intentions, the ABM Treaty did not yield the stability nor the reductions in strategic offensive arms its framers intended. It is not the ABM Treaty but the improved relationship

between the United States and the Soviet Union that is about to bring us the first ever agreement for stabilizing reductions in strategic offensive forces. Deployment of strategic defences would further enhance stability. We believe this argument is, and will remain, valid.

We also continue to believe that, in concert with reductions in strategic offensive arms, effective defences would greatly reduce any strategic benefits a side might obtain by cheating on international arms reductions agreements. Defences would help deter the proliferation of ballistic missile technology and devalue the potential political and military leverage of ballistic missiles - long thought to be the terror weapons of choice.

The proliferation of ballistic missile technology, underscored by the lessons learned from the Gulf War, confirms our conclusion that the regime established by the ABM Treaty must be changed. Positive changes in United States-Soviet relations, the need to address a truly mutual concern, and a United States ballistic missile defence programme which averts stated Soviet concerns may now provide a real opportunity for success in our negotiations. I stress that a negotiated cooperative transition is our goal. This is why we have been engaged in the Defense and Space Talks for six years and remain committed to their future.

V

The United States continues to offer a mechanism, the United States Defense and Space Treaty, to permit deployment of defences beyond the ABM Treaty following three years' discussion of specific measures for implementing a cooperative transition. Such a process of negotiation and discussion of concrete measures is far preferable to withdrawal from the ABM Treaty under the supreme interests provision found in article XV of that Treaty. The United States approach is measured, reasonable and appropriate.

We also understand full well that the negotiated cooperative transition we seek cannot be built in a vacuum but requires a sound foundation of trust. Therefore, another United States approach in the Defense and Space Talks is ensuring predictability in the development of the United States-Soviet strategic relationship which has up to now been characterized by secrecy. In contrast, openness makes the strategic relationship predictable, averting miscalculation and technological surprise, and thus is stabilizing.

To encourage openness, the United States has proposed a number of predictability measures designed to create a better understanding of strategic ballistic missile defence activities as early as the research stage - years before the appearance of advanced defences in the field. These United States measures include annual exchanges of data, meetings of experts, briefings, visits to laboratories, observations of tests, and ABM test satellite notifications.

As a demonstration of the United States approach and commitment to openness, at the Wyoming Ministerial in September 1989, Secretary of State Baker invited a group of Soviet experts to visit two United States laboratories conducting SDI research. In December 1989, 10 Soviet experts

visited the Alpha Chemical Laser at the TRW facility at San Juan Capistrano, California, and the BEAR Neutral Particle Beam Experiment at the Los Alamos National Laboratory, New Mexico. The Soviet guests saw hardware up close and had an opportunity to ask questions of United States scientists conducting the research.

To continue the momentum, Secretary Baker took further initiatives. In the spring of 1990, the United States proposed that the United States and Soviet Union conclude a free-standing executive agreement on these measures. Later in 1990, the United States proposed pilot implementation of United States predictability measures - a "trial-run". And last fall, the United States proposed that the two sides conduct "dual pilot implementation" - the United States would demonstrate its proposed predictability measures, and the Soviet Union would demonstrate its measures.

The United States remains committed to reciprocal openness in this area which we believe would be inherently stabilizing, consistent with the developing trends in United States-Soviet relations. We also believe that early conclusion of a free-standing predictability measures agreement would afford us the opportunity to build greater trust upon which we could construct even greater successes in the Defense and Space Talks.

VI

With the proliferation of ballistic missile technology growing near Soviet borders, and with our GPALS plan, the United States believes Soviet attitudes should evolve to permit defences against mutual concerns. Although to date there has been no shift in the official Soviet position on the deployment of defences beyond the narrow limits of the ABM Treaty, we continue to see evidence of an internal Soviet discussion over the role of ballistic missile defences. In addition, missile defence is more consistent with the new Soviet emphasis on "defensive doctrine". Thus, incentives exist for the Soviets to join with us to explore constructive measures to counter emerging threats.

The changes in the international environment, the lessons learned from the Gulf War, the improvement in United States-Soviet relations, and the shift to a defensive doctrine in the Soviet Union all should encourage our Soviet colleagues to consider relaxation of ABM Treaty constraints to meet mutual concerns.

There is considerable reason for optimism in the Defense and Space Talks. Here in Geneva, following the signing of the START Treaty, Presidents Bush and Gorbachev, in their June 1990 Washington Joint Summit Statement, committed the United States and USSR to seek an "appropriate relationship between strategic offences and defences". This is a good sign. Soon, the United States and the Soviet Union will begin to construct this new regime that could permit greater reliance on defences. This commitment should enable the sides to build upon improving relations and achieve success in future Defense and Space Talks to deal cooperatively with the evolving international environment.

CONFERENCE ON DISARMAMENT

CD/1088
8 July 1991

Original: ENGLISH

LETTER DATED 27 JUNE 1991 FROM THE PERMANENT REPRESENTATIVE OF CANADA ADDRESSED TO THE SECRETARY-GENERAL OF THE CONFERENCE ON DISARMAMENT TRANSMITTING THE ARMS CONTROL VERIFICATION OCCASIONAL PAPER NO. 7, ENTITLED "SATELLITES HARMING OTHER SATELLITES"*

During my plenary statement on 25 June I referred briefly to the questions of terminology and confidence-building measures in relation to the Prevention of an Arms Race in Outer Space. In this connection I have the honour of making available 112 copies, in English, of the Arms Control Verification Occasional Paper No. 7, entitled "Satellites Harming Other Satellites" by Dr. Peter Hughes, which explores a number of ambiguities concerning operations in space, analyses the concept of harm and touches on certain proposals for CMBs such as keep out zones and verification in space. I would be grateful if you would arrange for the distribution of these booklets to members of the Conference and to observers under a CD number. The French version will be available shortly.

(signed) Gerald E. Shannon
Ambassador and
Permanent Representative

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* A limited distribution of this brochure in English only has been made available to the members and non-members invited to participate in the work of the Conference on Disarmament. The French version will be available shortly.

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