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STRENGTHENING THE EFFECTIVENESS AND IMPROVING THE EFFICIENCY OF THE SAFEGUARDS SYSTEM

Report by the Director General to the General Conference

FOREWORD

1. Since its inception over 30 years ago, the Agency safeguards system has evolved and been strengthened by the regular introduction of new methods and techniques, improving both its effectiveness and efficiency. The increasing importance of assurance regarding the absence of any undeclared nuclear activities and installations in States with comprehensive safeguards agreements made it imperative to update the safeguards system by integrating into it measures that would give the Agency an improved capability of detecting clandestine nuclear activities if such exist.

2. Beginning in 1992, a number of decisions by the Board of Governors reaffirmed the requirements that Agency safeguards provide assurance regarding both the correctness and the completeness of nuclear material declarations by States with comprehensive safeguards agreements. The Board also endorsed a number of specific measures for increasing the Agency's capabilities in respect of verifying the completeness of States' declarations and requested the Director General to submit to it concrete proposals for the assessment, development and testing of measures for strengthening safeguards and improving its cost effectiveness. In response to this request the Secretariat presented in December 1993 a Programme, "Programme 93+2", which aimed to evaluate the technical, financial and legal aspects of a comprehensive set of measures, including those recommended by the Standing Advisory Group on Safeguards Implementation (SAGSI), and to present, early in 1995, proposals for a strengthened and more efficient safeguards system.

3. A report was presented to the March 1995 meeting of the Board of Governors (GOV/2784) which gave an overview of measures proposed for strengthening the safeguards system, and discussed each measure in terms of its cost, effort, assurance, legal aspects and its interrelation with other measures. The extensive comments made at this meeting resulted in the submission for the Board's consideration in June 1995 of a further document (GOV/2807) which contained a comprehensive set of strengthening and efficiency measures. Part 1 of GOV/2807 identified measures which in the Secretariat's view could be implemented under existing legal authority and which the Secretariat would proceed to implement. Part 2 of GOV/2807 identified measures which were believed to require complementary authority. The Board of Governors noted the Secretariat's intention to proceed with the implementation of Part 1 measures on the understanding that the concerns of Member States would be clarified and implementing arrangements elaborated by consultations between the Secretariat and Member States.

4. Following the June 1995 meeting of the Board of Governors, the Secretariat proceeded along dual tracks. One involved the substantial preparatory work necessary for the implementation of Part 1 measures and the other, as part of the process called for in GC(39)/RES/17, involved consultations with Member States on the form and content of a draft instrument for the complementary legal authority necessary to implement the measures in Part 2.

5. In December 1995, the Director General presented to the Board of Governors a draft discussion paper (Discussion Draft I) that described and explained the need for the new measures for which complementary legal authority would be required (Part 2 measures), and presented a draft protocol for the granting of such authority. Following the Board's discussion of the paper in December, in his summing up, the Chairman of the Board of Governors noted, *inter alia*, that the Board of Governors considered the paper as a step in the consultative process undertaken prior to finalizing the proposals for Part 2 of Programme 93+2.

6. Based on the comments made during the Board of Governors meeting and on subsequent consultations with Member States, the Secretariat produced a new discussion paper, Discussion Draft II, in February 1996. Following its considerations of Discussion Draft II in March 1996, the Board of Governors requested the Secretariat to take into account all comments made and to continue consultations with Member States with a view to submitting a formal text for the Board's consideration in June 1996.

7. Basing itself on Discussion Draft II and taking into account further consultations with Member States, the discussion at the March 1996 meeting of the Board of Governors, and written comments submitted by some Member States, the Secretariat prepared a formal document, GOV/2863, for consideration at the June 1996 Board of Governors meeting. Annex 3 to the document consisted of a draft model protocol.

8. The Chairman recalled the Board's endorsement of the general direction of Programme 93+2 and its acknowledgement that additional information, environmental sampling and increased physical access would strengthen the Agency's ability to detect any undeclared nuclear material and activities. In his summing up of the discussion, he referred to the necessity of striking a proper balance between the Agency's need for information and access on the one hand and the State's need to protect its legitimate interests and to respect its constitutional obligations on the other. He noted the Board's concern that implementation of those measures should be subject to strict rules of confidentiality to be observed by the Agency with regard both to information received and to the entire verification process. Concluding that the examination of a draft model protocol would provide opportunities to find precise language striking a balance between the concerns of individual States and the need to ensure the efficiency and effectiveness of the measures proposed, the Board decided to establish an open-ended committee to draft a model protocol, to be based on GOV/2863, Annex 3, and taking into account, *inter alia*, the explanation of the measures contained in that document and the discussions on the matter in the Board.

9. The committee, entitled the "Committee on Strengthening the Effectiveness and Improving the Efficiency of the Safeguards System", established by the Board of Governors on 14 June 1996, held its first series of meetings from 2 to 4 July 1996. Representatives of 61 States and two intergovernmental organizations attended. The committee undertook a first reading of the draft protocol article by article. Member States were asked to submit to the Secretariat written comments on the draft protocol by 1 August 1996. The Secretariat published a compendium of those comments in September 1996.

10. The work of Programme 93+2 has been a major effort by the Secretariat with extensive support from a large number of Member States. Progress on the programme was previously reported to the 1994, 1995 and 1996 General Conferences in documents GC(XXXVIII)/17, GC(39)17 and GC(40)17.

11. In September 1996, the General Conference, in resolution GC(40)/RES/16,

- called upon the Secretariat to continue the implementation of Part 1 measures as rapidly as time and resources allowed and urged the States concerned to facilitate this exercise by providing timely responses to the Secretariat's requests for information;

- welcomed the establishment by the Board of Governors of a Committee tasked with the drafting of a model protocol in order to strengthen the effectiveness and to improve the efficiency of the nuclear safeguards system and thereby reinforce and improve the Agency's capacity to detect any undeclared nuclear activities;

- urged the Committee to make every effort to advance its work with a view to reporting the outcome to the Board at its December 1996 session; and

- requested the Director General to report on the implementation of this resolution to the General Conference at its 41st regular session.

12. This report provides information on the Committee's work and related Board of Governors' discussions and decisions since the fortieth regular session of the General Conference. A summary of the Secretariat's ongoing work in implementing measures under existing legal authority is also provided.

ACTIVITIES SINCE THE FORTIETH GENERAL CONFERENCE

13. The second session of the Committee on Strengthening the Effectiveness and Improving the Efficiency of the Safeguards System (Committee 24) was held from 1 to 11 October 1996. As was the case for the first meeting of Committee 24, representatives of 61 Member States and two intergovernmental organizations participated. The Committee engaged in an extensive second reading of the draft Protocol (Annex 3 to document GOV/2863), using the Compendium of proposed changes resulting from the Committee's first reading in July 1996 as the main working document for this purpose.

14. The Chairman summed up the sense of the discussion on each of the articles as they were considered and these summings-up were subsequently used in preparation of a Rolling Text. The Rolling Text, issued as a Chairman's working paper on 18 October 1996, indicated areas of convergence and provided alternative formulations for areas where a divergence of views continued to exist. The Committee reported to the Board of Governors on progress achieved during its second session in document GOV/2885 (included here as Annex I).

15. The third session of Committee 24 was held from 20 to 31 January 1997 and proceeded with a detailed first reading of the Chairman's Rolling Text, during which suggestions for rewording some articles and for additional articles were made. As before, representatives from 61 Member States and two intergovernmental organizations participated. Considerable progress was made and the Committee agreed that a consolidated revised text, comprising largely consensus language, would be circulated by 7 February 1997 and that the Committee would meet again on 2 and 3 April 1997 with the intention of reaching agreement on a draft model protocol for submission to the Board. The Committee's report to the Board of Governors dated 6 February 1997 (GOV/2893, included here as Annex 2) referred to the considerable progress made during the January meeting and recommended to the Board that it hold a special session on 15 and 16 May 1997 to consider and approve the draft Model Protocol.

16. The fourth and final session of Committee 24 was held 2 to 4 April 1997. The Committee agreed on the text of a draft Model Protocol Additional to Safeguards Agreements to be submitted to the Board of Governors, thus completing the mandate given to the Committee by the Board in June 1996. The Committee's report to the Board, transmitting the draft Model Protocol for Board consideration and approval, summarized the Committee's

work and called to the Board's attention several of the key issues that had absorbed the Committee during its deliberations. The Committee's report, GOV/2914, is attached here as Annex 3.

17. The Board of Governors, meeting in special session on 15 May 1997 to consider GOV/2914, took the following actions:

(a) Took note of the report of the Committee on Strengthening the Effectiveness and Improving the Efficiency of the Safeguards System to the Board contained in document GOV/2914;

(b) Endorsed the understandings reached in the Committee, which were set forth Attachments 2 and 3 to its report, on the relationship between additional protocols and the respective safeguards agreements;

(c) Having taken note of the statements made under item 3 by States with non-comprehensive safeguards agreements, approved the draft Model Protocol contained in Attachment 1 to the Committee's report;

(d) Requested the Director General to proceed as set forth in the Foreword to the Model Protocol and to keep the Board regularly informed of the conclusion and entry into force of individual protocols;

(e) Agreed to set up open-ended ad hoc working groups to advise it whenever amendments were proposed to the lists contained in Annexes I and II, and confirmed that those working groups would follow the established practice of the Board in arriving at their decision; and

(f) Requested the Director General to review periodically and update the regime for the protection of confidential information and to keep the Board periodically informed on the implementation of that regime.

The complete oral record of the Board of Governors 15 May 1997 meeting is attached as Annex 4.

18. On the basis of the actions taken by the Board of Governors in its special session, the Director General has written letters to States with safeguards agreements with the Agency to inform them about the decision of the Board and inviting each of them to conclude an Additional Protocol.

ON-GOING ACTIVITIES

19. The Secretariat is proceeding with the implementation of Part 1 measures as rapidly as time and resources allow. Following the June 1995 Board of Governors meeting, a detailed implementation plan was developed, and letters were sent to States with

comprehensive safeguards agreements describing the actions the Secretariat had identified as necessary in order to proceed. The letter indicated that the Secretariat would implement Part 1 measures in 1996 as broadly and extensively as possible, subject to operational and budgetary constraints.

The following is a summary of the activities undertaken in implementation of the Part 1 measures:

(a) Broader access to information

- Through the actions taken in the past several years, such as the Reporting Scheme, the early provision of design information, additional information from States on their nuclear fuel cycle and information collection from open sources, the acquisition of substantially increased information is now part of the routine implementation of safeguards. The Department of Safeguards has strengthened its organizational structure for the evaluation and review of all safeguards relevant information. A new organizational entity, an Information Review Committee (comprised of Division Directors and a Co-ordinator from the Office of the DDG-SG), has been established for the review of State evaluations that are performed within the Divisions of Operations, with contributions from Support Divisions. Initial State-level evaluation and review is requiring significant effort. However, the continuing effort in evaluation as new information becomes available will be substantially less than that required for the initial evaluations. The Information Review Committee reports its recommendations for follow-up to the Deputy Director General for Safeguards and the results contribute to the conclusions reported in the annual Safeguards Implementation Report.

- Among the new technical measures being implemented, great importance is placed on the use of environmental sampling. Initial emphasis in its use has been placed on enrichment plants and selected facilities with hot cells. For enrichment plants, the objective of environmental sampling is to provide increased assurance of the absence of undeclared operations involving undeclared material and of enrichments greater than declared. For hot cells, the objective of environmental sampling is to provide increased assurance of the absence of undeclared separated material and operations. A "baseline signature" is first being established for activities performed at a facility; analytical results from future environmental samples will be compared with that signature and with the declared operations. Arrangements for the introduction of routine environmental sampling have been put in place, and detailed internal guidelines have been implemented, to ensure the anonymity of samples through the analysis

process and the confidentiality of any results. By the end of June 1997, baseline samples had been collected at eight enrichment facilities in five States and at 39 hot cells in 26 States. An evaluation report on the results of a baseline sampling of an individual facility is prepared for discussion with the State. The report includes measurement results, a comparison of the results with the declared operations and any inconsistencies observed.

- The confidentiality of safeguards information remains an important aspect of the Secretariat's work. A comprehensive review of the confidentiality regime has been carried out with a view to the protection of the information contributing to and derived from the evaluation and review process. Document GOV/2897, describing the Secretariat's regime for maintaining the confidentiality of safeguards information, was submitted to the Board of Governors for its consideration and approval during the March 1997 meeting. The Board generally endorsed the confidentiality regime described in GOV/2897, however, a number of suggestions were made for further strengthening the existing regime. Given these suggestions and the importance and complexity of the issues involved, there was wide support in the Board that the Secretariat seek the advice of an open-ended group of experts when supplementing the confidentiality regime prior to the submission of a further document to the Board for its consideration and endorsement.

- Specialized training on the collection of environmental samples, observational skills and proliferation indicators is now part of the Department of Safeguards' regular training programme. Training development efforts related to information collection and evaluation are underway.

(b) Increased physical access

- The use of unannounced inspections by the Agency is foreseen under comprehensive safeguards agreements. Work is continuing on the identification of ways in which unannounced inspections, in combination with additional operational data and advanced technology, could lead to more effective and efficient safeguards for a number of facility types. Under Member States Support Programmes, field trials have been carried out over the past several years at low-enriched uranium fuel fabrication plants in the USA and in Sweden to test practical aspects of safeguards approaches utilizing unannounced inspections. Similarly, field trials have also been carried out at large research reactors in Canada and South Africa. Increasing use of

unannounced inspections is expected to develop, particularly in connection with the application of remote monitoring and transmission of safeguards data.

(c) Optimal use of the present system

- In the strengthened safeguards system, increased co-operation with State systems of accounting and control of nuclear material (SSACs) will be an important element in achieving improved effectiveness and, especially, efficiency. During the past several years, significant optimization of the inspection activities in the EURATOM area has taken place through increased co-operation between the Agency and EURATOM inspectorates under a New Partnership Approach (NPA). The NPA, which builds on the long established co-operation and on EURATOM's safeguards capabilities, allows both organizations to reach their own independent conclusions in order to fulfill their safeguards obligations. The most widely used NPA procedure is that for light water power reactors. The NPA procedures for fuel fabrication plants have also brought significant IAEA savings at facilities in the EURATOM area. The principles used in these procedures have been generalized and incorporated into the Agency's safeguards criteria for possible wider use. As a step towards developing increased co-operation with SSACs, the Secretariat sent in December 1995 a questionnaire to all States with comprehensive safeguards agreements requesting information on their SSACs. Responses have been received from most States with significant nuclear programmes. The Secretariat is analyzing the information received and assessing the existing conditions of the SSAC with a view to expanded co-operation. The results of this assessment are being utilized in the discussions with States.

- As a step towards the objective of further reducing the cost of safeguards implementation while improving safeguards efficiency, the implementation of the existing technology for remote monitoring of safeguards data using telephone or satellite communications has been initiated by the Safeguards Department. A Remote Monitoring Project was established in October 1996 in the Department of Safeguards to prepare, through testing and planning, for routine implementation of remote monitoring techniques. The transfer of the surveillance, seals, radiation and other sensor with operator data via telephone or special satellite links is being demonstrated and the necessary arrangements and infrastructure are being prepared. Field trials carried out in 1996 and 1997 of two remote monitoring systems, one installed in a mixed oxide fuel storage vault in Switzerland and the other installed at a high-enriched uranium storage vault in the USA have shown that

system to be effective in monitoring events of safeguards relevance and cost competitive when compared to current safeguards activities. Other field testing in progress includes remote monitoring system equipment at a storage vault in South Africa. Arrangements have been made with Japanese and Canadian authorities for field trials of the remote monitoring techniques at light water reactors and Candu reactors starting in 1997. It is expected that upon completion of the necessary arrangements with the Member States authorities, procedures and infrastructure, the Department will begin implementation of these methods in 1998.

ANNEXES

Annex 1 Document GOV/2885: "Report to the Board of Governors by the Committee on Strengthening the Effectiveness and Improving the Efficiency of the Safeguards System (Com.24) on its Second Session"

Annex 2 Document GOV/2893: "Report to the Board of Governors by the Committee on Strengthening the Effectiveness and Improving the Efficiency of the Safeguards System (Com.24) on its Third Session"

Annex 3 Document GOV/2914: "Report of the Committee on Strengthening the Effectiveness and Improving the Efficiency of the Safeguards System (Committee 24) to the Board of Governors"

Annex 4 Official Records of the 15 May 1997 Special Session of the Board of Governors

ANNEX 1

B

GOV/2885
23 October 1996

International Atomic Energy Agency

BOARD OF GOVERNORS

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REPORT TO THE BOARD OF GOVERNORS BY THE COMMITTEE ON STRENGTHENING THE EFFECTIVENESS AND IMPROVING THE EFFICIENCY OF THE SAFEGUARDS SYSTEM (COM.24) ON ITS SECOND SESSION

1. The second session of the Committee on Strengthening the Effectiveness and Improving the Efficiency of the Safeguards System (Committee 24) was held from 1 to 11 October 1996. Representatives of 61 Member States and two intergovernmental organizations participated. There was again no participation by non-Member States of the Agency who had concluded or were obliged to conclude comprehensive safeguards agreements with the Agency.

2. At this session, the Committee had before it the following documents:

(a) the draft Protocol contained in Annex III to document GOV/2863;

(b) proposals made by Member States for changes to the draft Protocol, circulated under cover of the Notes by the Secretariat dated 14 and 22 August 1996;

(c) a compendium of proposed changes to the draft Protocol set out in document GOV/COM.24/3 dated 2 September 1996; and

(d) a paper prepared by the Secretariat on "Protection of confidentiality of safeguards information" circulated as a Note by the Secretariat dated 27 September 1996.

3. After a brief discussion on some organizational matters, the Committee engaged in an extensive second reading of the draft Protocol using the Compendium of proposed changes as the main working document for this purpose.

4. The Chairman summed up the sense of the discussion on each of the Articles as they were considered and these summings-up were subsequently used in the preparation of a Rolling Text. This text is intended to capture areas of convergence as well as ensuring that where continuing divergence exists, suggestions for alternative formulations will be put in square brackets with a view to assisting the Committee in moving the discussion forward.

5. A Rolling Text covering Articles 1-4, parts of Article 16 on Definitions and two Annexes thereto prepared on the basis of the summings-up by the Chairman on these Articles was circulated and it was further agreed that a Rolling Text covering all the Articles of the Protocol, including the Preamble, would be circulated to Permanent Missions not later than Friday, 18 October 1996. This has since been circulated as a Chairman's working paper (Chairman's W.P.2) dated 18 October .

6. It was agreed that the third reading of the Protocol envisaged for the next session of the Committee will be based on the full Rolling Text.

7. Considerable progress was made at this session of the Committee, including

- significant integration and simplification of the documentation before the Committee;

- focussing of the Committee's work on a single rolling text;

- progress towards agreement in a number of areas;

- greater clarity regarding areas of continuing differences;

- identification of future work to be done on the relationship of the Protocol, when concluded by States, with their existing safeguards agreements; and

- creation of a solid base for the next meeting of the Committee.

8. It was further agreed that the next session of the Committee will be held from 20 to 31 January 1997.

ANNEX 2

B

GOV/2893
6 February 1997

International Atomic Energy Agency

BOARD OF GOVERNORS

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REPORT TO THE BOARD OF GOVERNORS BY THE COMMITTEE ON STRENGTHENING THE EFFECTIVENESS AND IMPROVING THE EFFICIENCY OF THE SAFEGUARDS SYSTEM (COM.24) ON ITS THIRD SESSION

1. The third session of the Committee on Strengthening the Effectiveness and Improving the Efficiency of the Safeguards System (Committee 24) was held from 20 to 31 January 1997. Representatives of 61 Member States, the European Commission and the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials (ABACC) participated.

2. It was agreed that the Chairman's Rolling Text of the draft Protocol, dated 18 October 1996, should be used as the main working document during the session. In addition, the Committee had before it Working Paper W.P.21 containing an "Analysis of the application of the provisions of INFCIRC/153-type safeguards agreements in relation to the 18 October Rolling Text of the draft Protocol" and a Note by the Secretariat dated 17 January 1997 containing a draft of "The Agency's Regime for the Protection of Safeguards Confidential Information". The latter will be submitted to the Board for consideration at its session in March.

3. The Committee had an extensive first reading of the Chairman's Rolling Text dated 18 October 1996. During its deliberations, a number of suggestions for rewording certain articles and for additional articles were submitted for the Committee's consideration.

4. Considerable progress was made by the Committee during the session, which entailed seven evening meetings in addition to 19 morning and afternoon meetings.

5. A revised Rolling Text - Rolling Text/Rev.1 and Rolling Text/Rev.1/Add.1, Add.2, Add.3 and a revision thereto, and Add.4 of 27, 28, 29 and 30 January 1997 - was circulated by the Chairman in the light of the first reading of the Rolling Text dated 18 October 1996.

6. The revised Rolling Text was discussed and changes made thereto. The Committee agreed that a consolidated revised text would be circulated by 7 February 1997.

7. The Committee also agreed that it would meet again in Vienna on 2 and 3 April 1997 in order to consider the consolidated revised text with the intention of reaching agreement on a draft model Protocol for submission to the Board.

8. To that end, the Committee agreed to recommend to the Board that it hold a special session on 15 and 16 May 1997 in order to consider and approve the draft model Protocol.

ANNEX 3

B

GOV/2914
10 April 1997

International Atomic Energy Agency

BOARD OF GOVERNORS

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Item 4 of the provisional agenda
(GOV/2912)

REPORT OF THE COMMITTEE ON STRENGTHENING THE EFFECTIVENESS AND IMPROVING THE EFFICIENCY OF THE SAFEGUARDS SYSTEM (COMMITTEE 24) TO THE BOARD OF GOVERNORS

1. At its June 1996 session, the Board of Governors decided to establish a committee with the task of drafting a model protocol. The Committee's mandate was outlined in more detail in the Chairman's summing-up of the Board's discussion under agenda item 4(b) at its meeting on 14 June 1996 (GOV/OR.898, paras 84-100). All Member States of the Agency, all other States which had concluded or had a legal obligation to conclude a comprehensive safeguards agreement with the Agency and any intergovernmental organizations which were parties to such an agreement were invited to participate in the Committee's work - the intergovernmental organizations as observers.

2. The Committee on Strengthening the Effectiveness and Improving the Efficiency of the Safeguards System [hereinafter referred to as the "Committee"] held four series of meetings: July 2-4, 1996; October 1-11, 1996; January 20-31, 1997; and April 2-4, 1997.

3. On 3 April 1997, the Committee agreed on a draft Model Protocol for submission to the Board of Governors and has thus completed the mandate given to it by the Board in June 1996.

4. During the sessions, the Committee had before it, as its main working documents, the following:

(a) Document GOV/2863 and GOV/2863/Corr.1 and Corr.2 thereto. A draft Protocol was included in Annex III to the document;

(b) Written proposals of Member States circulated as working papers (GOV/COM.24/W.P.1-20);

(c) A Compendium of changes proposed to the draft Protocol in Annex III to document GOV/2863 and Corr.1 (GOV/COM.24/3);

(d) Rolling Text of the draft Model Protocol dated 18 October 1996 (GOV/COM.24/Chairman's W.P.2);

(e) Secretariat's paper of 6 December 1996 entitled "Analysis of the application of the provisions of INFCIRC/153-type safeguards agreements in relation to the 18 October 1996 Rolling Text of the draft Protocol" (GOV/COM.24/W.P.21);

(f) Note by the Secretariat dated 17 January 1997 to which was attached a Secretariat draft of the "Agency's Regime for the Protection of Safeguards Confidential Information"; and

(g) Chairman's Consolidated Revised Text of the draft Model Protocol dated 5 February 1997.

5. In agreeing to submit the draft Model Protocol for the Board's consideration, participating States took into consideration the declaration made by the Chairman of the Committee at the opening meeting of its session of January 20-31, 1997. In that statement, the Chairman - inter alia - indicated his understanding that the Nuclear Weapon States

"had been looking at two issues:

(a) the substance, that is to say, what measures that will be accepted by States with comprehensive safeguards agreements that they, the Nuclear Weapon States, will be prepared to adopt; and,

(b) the procedures for ensuring that commitments on the part of both the NWS and NNWS proceed with a certain degree of parallelism."

6. The Chairman went on to note that

"this means that the meeting of the Board that would be called upon to approve the report of the Committee (including the Protocol) would take a decision on the Protocol in light of an understanding of the positions of the NWS.
This would be achieved by the NWS setting out their positions before the Board so that the Board could take account of this information in approving the Protocol.

The Board meeting may also be an appropriate moment for any other country that might wish to indicate its position to do so."

7. The Committee recommends to the Board that in its consideration of the draft Model Protocol it take account of the foregoing statement by the Chairman and such developments as relate to it.

8. With regard to the last sentence of the Chairman's text quoted in paragraph 6, all the participating States with exclusively INFCIRC/66-type agreements indicated that, in their view, the provisions of the draft Model Protocol are not applicable to them.

9. A number of other delegations called upon all States with exclusively INFCIRC/66-type agreements to negotiate with the Director General additional protocols containing measures provided for in the draft Model Protocol.

10. The Committee was concerned about the need to ensure that the Agency shall have a stringent regime for the protection of confidential information and therefore wishes to bring to the attention of the Board the provisions of Article 15 of the draft Model Protocol.

11. Following discussion in the Committee on the issue, the Secretariat subsequently submitted for the consideration of the Board at its March session, a paper on "The Agency's Regime for the Protection of Safeguards Confidential Information" contained in document GOV/2897 of 13 February 1997.

12. In March, the Board, while generally endorsing the Agency's regime for the protection of safeguards confidential information described in document GOV/2897, requested the Secretariat to consider all the suggestions made and, as appropriate, incorporate them in a further document which would supplement document GOV/2897 and which would be submitted for the Board's consideration later this year.

13. The Committee also wishes to draw the attention of the Board to the statement by Mr. ElBaradei, Assistant Director General, Division of External Relations, on 31 January 1997 setting out the Secretariat's interpretation of the relationship between the Additional Protocol and the relevant safeguards agreement. The Committee took note of the Secretariat's interpretation and also wished to place on record its understanding concerning its interpretation of Article 1 as far as the manner of concluding additional Protocols and the responsibility for their implementation are concerned. The Committee reverted to this matter in its final meeting and confirmed the earlier interpretation. Attached to this report are the

Secretariat's Interpretation of 31 January 1997 (Attachment 2) and the Committee's Understanding of 3 April 1997 (Attachment 3).

14. The Committee was also concerned about the amendment procedures for the list of activities specified in Annex I and the list of equipment and material specified in Annex II. The Committee draws to the attention of the Board that, as provided for in Article 16 b. of the draft Model Protocol, the list of activities specified in Annex I and the list of equipment and material specified in Annex II may be amended by the Board upon the advice of an open-ended working group of experts established by the Board for that purpose. It is understood that in arriving at its decisions, the open-ended working group will follow the established practice of the Board. The Committee also agreed on a simplified procedure for amending Annexes I and II. A number of delegations stressed the need for greater transparency concerning a number of non-nuclear materials and items not on the list in Annex I.

RECOMMENDED ACTION BY THE BOARD

15. In the light of the foregoing, the Committee recommends that the Board:

(a) take note of this report;

(b) take note of the statements by non-comprehensive safeguards States setting out their positions in the Board with respect to measures provided for in the Model Protocol;

(c) endorse the understandings reached in the Committee on the relationship between additional protocols and the respective safeguards agreements;

(d) approve the draft Model Protocol in Attachment 1 to this Report;

(e) request the Director General to proceed as set forth in the Foreword to the Model Protocol and to keep the Board regularly informed of the conclusion and entry into force of individual protocols;

(f) agree to set up open-ended ad-hoc working groups to advise it whenever amendments are proposed to the lists contained in Annexes I and II and confirm that these working groups will follow the established practice of the Board in arriving at their decisions; and

(g) request the Director General to periodically review and update the regime for the protection of confidential information and to keep the Board periodically informed on the implementation of the regime.

GOV/2914
Attachment 1

3 April 1997

ATTACHMENT 1

Committee on Strengthening the Effectiveness and Improving the Efficiency of the Safeguards System

Draft Model Protocol

PROTOCOL ADDITIONAL TO THE AGREEMENT(S) BETWEEN ..... AND THE INTERNATIONAL ATOMIC ENERGY AGENCY FOR THE APPLICATION OF SAFEGUARDS

Foreword

This document is a model Additional Protocol designed for States having a Safeguards Agreement with the Agency, in order to strengthen the effectiveness and improve the efficiency of the safeguards system as a contribution to global nuclear non-proliferation objectives.

The Board of Governors has requested the Director General to use this Model Protocol as the standard for additional protocols that are to be concluded by States and other parties to comprehensive safeguards agreements with the Agency. Such protocols shall contain all of the measures in this Model Protocol.

The Board of Governors has also requested the Director General to negotiate additional protocols or other legally binding agreements with nuclear-weapon States incorporating those measures provided for in the Model Protocol that each nuclear-weapon State has identified as capable of contributing to the non-proliferation and efficiency aims of the Protocol, when implemented with regard to that State, and as consistent with that State's obligations under Article I of the NPT.

The Board of Governors has further requested the Director General to negotiate additional protocols with other States that are prepared to accept measures provided for in the model Protocol in pursuance of safeguards effectiveness and efficiency objectives.

In conformity with the requirements of the Statute, each individual Protocol or other legally binding agreement will require the approval of the Board and its authorization to the Director General to conclude and subsequently implement the Protocol so approved.

Preamble

WHEREAS ..... (hereinafter referred to as ".....") is a party to (an) Agreement(s) between ..... and the International Atomic Energy Agency (hereinafter referred to as the "Agency") for the application of safeguards [full title of the Agreement(s) to be inserted] (hereinafter referred to as the "Safeguards Agreement(s)"), which entered into force on .....;

AWARE OF the desire of the international community to further enhance nuclear non-proliferation by strengthening the effectiveness and improving the efficiency of the Agency's safeguards system;

RECALLING that the Agency must take into account in the implementation of safeguards the need to: avoid hampering the economic and technological development of ..... or international co-operation in the field of peaceful nuclear activities; respect health, safety, physical protection and other security provisions in force and the rights of individuals; and take every precaution to protect commercial, technological and industrial secrets as well as other confidential information coming to its knowledge;

WHEREAS the frequency and intensity of activities described in this Protocol shall be kept to the minimum consistent with the objective of strengthening the effectiveness and improving the efficiency of Agency safeguards;

NOW THEREFORE ..... and the Agency have agreed as follows:

RELATIONSHIP BETWEEN THE PROTOCOL AND THE SAFEGUARDS AGREEMENT

Article 1

The provisions of the Safeguards Agreement shall apply to this Protocol to the extent that they are relevant to and compatible with the provisions of this Protocol. In case of conflict between the provisions of the Safeguards Agreement and those of this Protocol, the provisions of this Protocol shall apply.

PROVISION OF INFORMATION

Article 2

a. ..... shall provide the Agency with a declaration containing:

(i) A general description of and information specifying the location of *nuclear fuel cycle-related research and development activities*[1/] not involving *nuclear material* carried out anywhere that are funded, specifically authorized or controlled by, or carried out on behalf of, ...

(ii) Information identified by the Agency on the basis of expected gains in effectiveness or efficiency, and agreed to by ....., on operational activities of safeguards relevance at *facilities* and *locations outside facilities* where *nuclear material* is customarily used.

1/ Terms in italics have specialized meanings, which are defined in Article 18 below.

(iii) A general description of each building on each *site*, including its use and, if not apparent from that description, its contents. The description shall include a map of the *site*.

(iv) A description of the scale of operations for each location engaged in the activities specified in Annex I to this Protocol.

(v) Information specifying the location, operational status and the estimated annual production capacity of uranium mines and concentration plants and thorium concentration plants, and the current annual production of such mines and concentration plants for ..... as a whole. ..... shall provide, upon request by the Agency, the current annual production of an individual mine or concentration plant. The provision of this information does not require detailed *nuclear material* accountancy.

(vi) Information regarding source material which has not reached the composition and purity suitable for fuel fabrication or for being isotopically enriched, as follows:

(a) the quantities, the chemical composition, the use or intended use of such material, whether in nuclear or non-nuclear use, for each location in ..... at which the material is present in quantities exceeding ten metric tons of uranium and/or twenty metric tons of thorium, and for other locations with quantities of more than one metric ton, the aggregate for ..... as a whole if the aggregate exceeds ten metric tons of uranium or twenty metric tons of thorium. The provision of this information does not require detailed *nuclear material* accountancy;

(b) the quantities, the chemical composition and the destination of each export out of ....., of such material for specifically non-nuclear purposes in quantities exceeding:

(1) ten metric tons of uranium, or for successive exports of uranium from ..... to the same State, each of less than ten metric tons, but exceeding a total of ten metric tons for the year;

(2) twenty metric tons of thorium, or for successive exports of thorium from ..... to the same State, each of less than twenty metric tons, but exceeding a total of twenty metric tons for the year;

(c) the quantities, chemical composition, current location and use or intended use of each import into ..... of such material for specifically non-nuclear purposes in quantities exceeding:

(1) ten metric tons of uranium, or for successive imports of uranium into ..... each of less than ten metric tons, but exceeding a total of ten metric tons for the year;

(2) twenty metric tons of thorium, or for successive imports of thorium into ..... each of less than twenty metric tons, but exceeding a total of twenty metric tons for the year;

it being understood that there is no requirement to provide information on such material intended for a non-nuclear use once it is in its non-nuclear end-use form.

(vii) (a) information regarding the quantities, uses and locations of *nuclear material* exempted from safeguards pursuant to [paragraph 37 of INFCIRC/153][2/];

(b) information regarding the quantities (which may be in the form of estimates) and uses at each location, of *nuclear material* exempted from safeguards pursuant to [paragraph 36(b) of INFCIRC/153][2/] but not yet in a non-nuclear end-use form, in quantities exceeding those set out in [paragraph 37 of INFCIRC/153][2/]. The provision of this information does not require detailed *nuclear material* accountancy.

(viii) Information regarding the location or further processing of intermediate or high-level waste containing plutonium, *high enriched uranium* or uranium-233 on which safeguards have been terminated pursuant to [paragraph 11 of INFCIRC/153][2/]. For the purpose of this paragraph, "further processing" does not include repackaging of the waste or its further conditioning not involving the separation of elements, for storage or disposal.

(ix) The following information regarding specified equipment and non-nuclear material listed in Annex II:

(a) for each export out of ..... of such equipment and material: the identity, quantity, location of intended use in the receiving State and date or, as appropriate, expected date, of export;

(b) upon specific request by the Agency, confirmation by ....., as importing State, of information provided to the Agency in accordance with paragraph (a) above.

2/ The reference to the corresponding provision of the relevant Safeguards Agreement should be inserted where bracketed references to INFCIRC/153 are made.

(x) General plans for the succeeding ten-year period relevant to the development of the nuclear fuel cycle (including planned *nuclear fuel cycle-related research and development activities*) when approved by the appropriate authorities in ..... .

b. ..... shall make every reasonable effort to provide the Agency with the following information:

(i) a general description of and information specifying the location of *nuclear fuel cycle-related research and development activities* not involving *nuclear material* which are specifically related to enrichment, reprocessing of nuclear fuel or the processing of intermediate or high-level waste containing plutonium, *high enriched uranium* or uranium-233 that are carried out anywhere in ..... but which are not funded, specifically authorized or controlled by, or carried out on behalf of, ... For the purpose of this paragraph, "processing" of intermediate or high-level waste does not include repackaging of the waste or its conditioning not involving the separation of elements, for storage or disposal.

(ii) A general description of activities and the identity of the person or entity carrying out such activities, at locations identified by the Agency outside a *site* which the Agency considers might be functionally related to the activities of that *site*. The provision of this information is subject to a specific request by the Agency. It shall be provided in consultation with the Agency and in a timely fashion.

c. Upon request by the Agency, ... shall provide amplifications or clarifications of any information it has provided under this Article, in so far as relevant for the purpose of safeguards.

Article 3

a. ..... shall provide to the Agency the information identified in Article 2.a.(i), (iii), (iv), (v), (vi)(a), (vii) and (x) and Article 2.b.(i) within 180 days of the entry into force of this Protocol.

b. ..... shall provide to the Agency, by 15 May of each year, updates of the information referred to in paragraph a. above for the period covering the previous calendar year. If there has been no change to the information previously provided, ... shall so indicate.

c. ..... shall provide to the Agency, by 15 May of each year, the information identified in Article 2.a.(vi)(b) and (c) for the period covering the previous calendar year.

d. ..... shall provide to the Agency on a quarterly basis the information identified in Article 2.a.(ix)(a). This information shall be provided within sixty days of the end of each quarter.

e. ..... shall provide to the Agency the information identified in Article 2.a.(viii) 180 days before further processing is carried out and, by 15 May of each year, information on changes in location for the period covering the previous calendar year.

f. ..... and the Agency shall agree on the timing and frequency of the provision of the information identified in Article 2.a.(ii).

g. ..... shall provide to the Agency the information in Article 2.a.(ix)(b) within sixty days of the Agency's request.

COMPLEMENTARY ACCESS

Article 4

The following shall apply in connection with the implementation of complementary access under Article 5 of this Protocol:

a. The Agency shall not mechanistically or systematically seek to verify the information referred to in Article 2; however, the Agency shall have access to:

(i) Any location referred to in Article 5.a.(i) or (ii) on a selective basis in order to assure the absence of undeclared *nuclear material* and activities;

(ii) Any location referred to in Article 5.b. or c. to resolve a question relating to the correctness and completeness of the information provided pursuant to Article 2 or to resolve an inconsistency relating to that information;

(iii) Any location referred to in Article 5.a.(iii) to the extent necessary for the Agency to confirm, for safeguards purposes, ...'s declaration of the decommissioned status of a *facility* or *location outside facilities* where *nuclear material* was customarily used.

b. (i) Except as provided in paragraph (ii) below, the Agency shall give ..... advance notice of access of at least 24 hours;

(ii) For access to any place on a *site* that is sought in conjunction with design information verification visits or ad hoc or routine inspections on that *site*, the period of advance notice shall, if the Agency so requests, be at least two hours but, in exceptional circumstances, it may be less than two hours.

c. Advance notice shall be in writing and shall specify the reasons for access and the activities to be carried out during such access.

d. In the case of a question or inconsistency, the Agency shall provide ..... with an opportunity to clarify and facilitate the resolution of the question or inconsistency. Such an opportunity will be provided before a request for access, unless the Agency considers that delay in access would prejudice the purpose for which the access is sought. In any event, the Agency shall not draw any conclusions about the question or inconsistency until ..... has been provided with such an opportunity.

e. Unless otherwise agreed to by ....., access shall only take place during regular working hours.

f. ..... shall have the right to have Agency inspectors accompanied during their access by representatives of ....., provided that the inspectors shall not thereby be delayed or otherwise impeded in the exercise of their functions.

Article 5

..... shall provide the Agency with access to:

a. (i) Any place on a *site*;

(ii) Any location identified by ..... under Article 2.a.(v)-(viii);

(iii) Any *decommissioned facility* or *decommissioned location outside facilities* where *nuclear material* was customarily used.

b. Any location identified by ..... under Article 2.a.(i), Article 2.a.(iv), Article 2.a.(ix)(b) or Article 2.b, other than those referred to in paragraph a.(i) above,

provided that if ..... is unable to provide such access, ... shall make every reasonable effort to satisfy Agency requirements, without delay, through other means.

c. Any location specified by the Agency, other than locations referred to in paragraphs a. and b. above, to carry out *location-specific environmental sampling*, provided that if ..... is unable to provide such access, ... shall make every reasonable effort to satisfy Agency requirements, without delay, at adjacent locations or through other means.

Article 6

When implementing Article 5, the Agency may carry out the following activities:

a. For access in accordance with Article 5.a.(i) or (iii): visual observation; collection of environmental samples; utilization of radiation detection and measurement devices; application of seals and other identifying and tamper indicating devices specified in Subsidiary Arrangements; and other objective measures which have been demonstrated to be technically feasible and the use of which has been agreed by the Board of Governors (hereinafter referred to as the "Board") and following consultations between the Agency and .....

b. For access in accordance with Article 5.a.(ii): visual observation; item counting of *nuclear material*; non-destructive measurements and sampling; utilization of radiation detection and measurement devices; examination of records relevant to the quantities, origin and disposition of the material; collection of environmental samples; and other objective measures which have been demonstrated to be technically feasible and the use of which has been agreed by the Board and following consultations between the Agency and .....

c. For access in accordance with Article 5.b.: visual observation; collection of environmental samples; utilization of radiation detection and measurement devices; examination of safeguards relevant production and shipping records; and other objective measures which have been demonstrated to be technically feasible and the use of which has been agreed by the Board and following consultations between the Agency and .....

d. For access in accordance with Article 5.c., collection of environmental samples and, in the event the results do not resolve the question or inconsistency at the location specified by the Agency pursuant to Article 5.c., utilization at that location of visual observation, radiation detection and measurement devices, and, as agreed by ..... and the Agency, other objective measures.

Article 7

a. Upon request by ....., the Agency and ..... shall make arrangements for managed access under this Protocol in order to prevent the dissemination of proliferation sensitive information, to meet safety or physical protection requirements, or to protect proprietary or commercially sensitive information. Such arrangements shall not preclude the Agency from conducting activities necessary to provide credible assurance of the absence of undeclared *nuclear materials* and activities at the location in question, including the resolution of a question relating to the correctness and completeness of the information referred to in Article 2 or of an inconsistency relating to that information.

b. ..... may, when providing the information referred to in Article 2, inform the Agency of the places at a *site* or location at which managed access may be applicable.

c. Pending the entry into force of any necessary Subsidiary Arrangements, ... may have recourse to managed access consistent with the provisions of paragraph a. above.

Article 8

Nothing in this Protocol shall preclude ..... from offering the Agency access to locations in addition to those referred to in Articles 5 and 9 or from requesting the Agency to conduct verification activities at a particular location. The Agency shall, without delay, make every reasonable effort to act upon such a request.

Article 9

..... shall provide the Agency with access to locations specified by the Agency to carry out *wide-area environmental sampling*, provided that if ..... is unable to provide such access it shall make every reasonable effort to satisfy Agency requirements at alternative locations. The Agency shall not seek such access until the use of *wide-area environmental sampling* and the procedural arrangements therefor have been approved by the Board and following consultations between the Agency and .....

Article 10

The Agency shall inform ..... of:

a. The activities carried out under this Protocol, including those in respect of any questions or inconsistencies the Agency had brought to the attention of ....., within sixty days of the activities being carried out by the Agency.

b. The results of activities in respect of any questions or inconsistencies the Agency had brought to the attention of ....., as soon as possible but in any case within thirty days of the results being established by the Agency.

c. The conclusions it has drawn from its activities under this Protocol. The conclusions shall be provided annually.

DESIGNATION OF AGENCY INSPECTORS

Article 11

a. (i) The Director General shall notify ..... of the Board's approval of any Agency official as a safeguards inspector. Unless ..... advises the Director General of its rejection of such an official as an inspector for ..... within three months of receipt of notification of the Board's approval, the inspector so notified to ..... shall be considered designated to ..... ;

(ii) The Director General, acting in response to a request by ..... or on his own initiative, shall immediately inform ..... of the withdrawal of the designation of any official as an inspector for ..... .

b. A notification referred to in paragraph a. above shall be deemed to be received by ..... seven days after the date of the transmission by registered mail of the notification by the Agency to ..... .

VISAS

Article 12

..... shall, within one month of the receipt of a request therefor, provide the designated inspector specified in the request with appropriate multiple entry/exit and/or transit visas, where required, to enable the inspector to enter and remain on the territory of ..... for the purpose of carrying out his/her functions. Any visas required shall be valid for at least one year and shall be renewed, as required, to cover the duration of the inspector's designation to ..... .

SUBSIDIARY ARRANGEMENTS

Article 13

a. Where ..... or the Agency indicates that it is necessary to specify in Subsidiary Arrangements how measures laid down in this Protocol are to be applied, ... and the Agency shall agree on such Subsidiary Arrangements within ninety days of the entry into force of this Protocol or, where the indication of the need for such Subsidiary Arrangements is made after the entry into force of this Protocol, within ninety days of the date of such indication.

b. Pending the entry into force of any necessary Subsidiary Arrangements, the Agency shall be entitled to apply the measures laid down in this Protocol.

COMMUNICATIONS SYSTEMS

Article 14

a. ..... shall permit and protect free communications by the Agency for official purposes between Agency inspectors in ..... and Agency Headquarters and/or Regional Offices, including attended and unattended transmission of information generated by Agency containment and/or surveillance or measurement devices. The Agency shall have, in consultation with ....., the right to make use of internationally established systems of direct communications, including satellite systems and other forms of telecommunication, not in use in ..... At the request of ..... or the Agency, details of the implementation of this paragraph with respect to the attended or unattended transmission of information generated by Agency containment and/or surveillance or measurement devices shall be specified in the Subsidiary Arrangements.

b. Communication and transmission of information as provided for in paragraph a. above shall take due account of the need to protect proprietary or commercially sensitive information or design information which ..... regards as being of particular sensitivity.

PROTECTION OF CONFIDENTIAL INFORMATION

Article 15

a. The Agency shall maintain a stringent regime to ensure effective protection against disclosure of commercial, technological and industrial secrets and other confidential information coming to its knowledge, including such information coming to the Agency's knowledge in the implementation of this Protocol.

b. The regime referred to in paragraph a. above shall include, among others, provisions relating to:

(i) General principles and associated measures for the handling of confidential information;

(ii) Conditions of staff employment relating to the protection of confidential information;

(iii) Procedures in cases of breaches or alleged breaches of confidentiality.

c. The regime referred to in paragraph a. above shall be approved and periodically reviewed by the Board.

ANNEXES

Article 16

a. The Annexes to this Protocol shall be an integral part thereof. Except for the purposes of amendment of the Annexes, the term "Protocol" as used in this instrument means the Protocol and the Annexes together.

b. The list of activities specified in Annex I, and the list of equipment and material specified in Annex II, may be amended by the Board upon the advice of an open-ended working group of experts established by the Board. Any such amendment shall take effect four months after its adoption by the Board.

ENTRY INTO FORCE

Article 17

This Protocol shall enter into force

on the date on which the Agency receives from ..... written notification that .....'s statutory and/or constitutional requirements for entry into force have been met.

OR[3/]

upon signature by the representatives of ..... and the Agency.

..... may, at any date before this Protocol enters into force, declare that it will apply this Protocol provisionally.

The Director General shall promptly inform all Member States of the Agency of any declaration of provisional application of, and of the entry into force of, this Protocol.

3/ The choice of alternative depends on the preference of the State concerned according to its internal legal requirements.

DEFINITIONS

Article 18

For the purpose of this Protocol:

a. *Nuclear fuel cycle-related research and development activities* means those activities which are specifically related to any process or system development aspect of any of the following:

- conversion of *nuclear material*,
- enrichment of *nuclear material*,
- nuclear fuel fabrication,
- reactors,
- critical facilities,
- reprocessing of nuclear fuel,
- processing (not including repackaging or conditioning not involving the separation of elements, for storage or disposal) of intermediate or high-level waste containing plutonium, *high enriched uranium* or uranium-233,

but do not include activities related to theoretical or basic scientific research or to research and development on industrial radioisotope applications, medical, hydrological and agricultural applications, health and environmental effects and improved maintenance.

b. *Site* means that area delimited by ..... in the relevant design information for a *facility*, including a *closed-down facility*, and in the relevant information on a *location outside facilities* where *nuclear material* is customarily used, including a *closed-down location outside facilities* where *nuclear material* was customarily used (this is limited to locations with hot cells or where activities related to conversion, enrichment, fuel fabrication or reprocessing were carried out). It shall also include all installations, co-located with the *facility* or location, for the provision or use of essential services, including: hot cells for processing irradiated materials not containing *nuclear material*; installations for the treatment, storage and disposal of waste; and buildings associated with specified items identified by ..... under Article 2.a.(iv) above.

c. *Decommissioned facility* or *decommissioned location outside facilities* means an installation or location at which residual structures and equipment essential for its use have been removed or rendered inoperable so that it is not used to store and can no longer be used to handle, process or utilize *nuclear material*.

d. *Closed-down facility* or *closed-down location outside facilities* means an installation or location where operations have been stopped and the *nuclear material* removed but which has not been decommissioned.

e. *High enriched uranium* means uranium containing 20 percent or more of the isotope uranium-235.

f. *Location-specific environmental sampling* means the collection of environmental samples (e.g., air, water, vegetation, soil, smears) at, and in the immediate vicinity of, a location specified by the Agency for the purpose of assisting the Agency to draw conclusions about the absence of undeclared *nuclear material* or nuclear activities at the specified location.

g. *Wide-area environmental sampling* means the collection of environmental samples (e.g., air, water, vegetation, soil, smears) at a set of locations specified by the Agency for the purpose of assisting the Agency to draw conclusions about the absence of undeclared *nuclear material* or nuclear activities over a wide area.

h. *Nuclear material* means any source or any special fissionable material as defined in Article XX of the Statute. The term source material shall not be interpreted as applying to ore or ore residue. Any determination by the Board under Article XX of the Statute of the Agency after the entry into force of this Protocol which adds to the materials considered to be source material or special fissionable material shall have effect under this Protocol only upon acceptance by .....

i. *Facility* means:

(i) A reactor, a critical facility, a conversion plant, a fabrication plant, a reprocessing plant, an isotope separation plant or a separate storage installation; or

(ii) Any location where *nuclear material* in amounts greater than one effective kilogram is customarily used.

j. *Location outside facilities* means any installation or location, which is not a *facility*, where *nuclear material* is customarily used in amounts of one effective kilogram or less.

ANNEX I

LIST OF ACTIVITIES REFERRED TO IN ARTICLE 2.a.(iv) OF THE PROTOCOL

(i) The manufacture of *centrifuge rotor tubes* or the assembly of *gas centrifuges*.

Centrifuge rotor tubes means thin-walled cylinders as described in entry 5.1.1(b) of Annex II.

Gas centrifuges means centrifuges as described in the Introductory Note to entry 5.1 of Annex II.

(ii) The manufacture of *diffusion barriers*.

Diffusion barriers means thin, porous filters as described in entry 5.3.1(a) of Annex II.

(iii) The manufacture or assembly of *laser-based systems*.

Laser-based systems means systems incorporating those items as described in entry 5.7 of Annex II.

(iv) The manufacture or assembly of *electromagnetic isotope separators*.

Electromagnetic isotope separators means those items referred to in entry 5.9.1 of Annex II containing ion sources as described in 5.9.1(a) of Annex II.

(v) The manufacture or assembly of *columns* or *extraction equipment*.

Columns or *extraction equipment* means those items as described in entries 5.6.1, 5.6.2, 5.6.3, 5.6.5, 5.6.6, 5.6.7 and 5.6.8 of Annex II.

(vi) The manufacture of *aerodynamic separation nozzles* or *vortex tubes*.

Aerodynamic separation nozzles or *vortex tubes* means separation nozzles and vortex tubes as described respectively in entries 5.5.1 and 5.5.2 of Annex II.

(vii) The manufacture or assembly of *uranium plasma generation systems*.

Uranium plasma generation systems means systems for the generation of uranium plasma as described in entry 5.8.3 of Annex II.

(viii) The manufacture of *zirconium tubes*.

Zirconium tubes means tubes as described in entry 1.6 of Annex II.

(ix) The manufacture or upgrading of *heavy water or deuterium*.

Heavy water or deuterium means deuterium, heavy water (deuterium oxide) and any other deuterium compound in which the ratio of deuterium to hydrogen atoms exceeds 1:5000.

(x) The manufacture of *nuclear grade graphite*.

Nuclear grade graphite means graphite having a purity level better than 5 parts per million boron equivalent and with a density greater than 1.50 g/cm^3 .

(xi) The manufacture of *flasks for irradiated fuel*.

A *flask for irradiated fuel* means a vessel for the transportation and/or storage of irradiated fuel which provides chemical, thermal and radiological protection, and dissipates decay heat during handling, transportation and storage.

(xii) The manufacture of *reactor control rods*.

Reactor control rods means rods as described in entry 1.4 of Annex II.

(xiii) The manufacture of *criticality safe tanks and vessels*.

Criticality safe tanks and vessels means those items as described in entries 3.2 and 3.4 of Annex II.

(xiv) The manufacture of *irradiated fuel element chopping machines*.

Irradiated fuel element chopping machines means equipment as described in entry 3.1 of Annex II.

(xv) The construction of *hot cells*.

Hot cells means a cell or interconnected cells totalling at least 6 m^3 in volume with shielding equal to or greater than the equivalent of 0.5 m of concrete, with a density of 3.2 g/cm^3 or greater, outfitted with equipment for remote operations.

ANNEX II

LIST OF SPECIFIED EQUIPMENT AND NON-NUCLEAR MATERIAL FOR THE REPORTING OF EXPORTS AND IMPORTS ACCORDING TO ARTICLE 2.a.(ix)*/

1. Reactors and equipment therefor

1.1. Complete nuclear reactors

Nuclear reactors capable of operation so as to maintain a controlled self-sustaining fission chain reaction, excluding zero energy reactors, the latter being defined as reactors with a designed maximum rate of production of plutonium not exceeding 100 grams per year.

EXPLANATORY NOTE

A "nuclear reactor" basically includes the items within or attached directly to the reactor vessel, the equipment which controls the level of power in the core, and the components which normally contain or come in direct contact with or control the primary coolant of the reactor core.

It is not intended to exclude reactors which could reasonably be capable of modification to produce significantly more than 100 grams of plutonium per year. Reactors designed for sustained operation at significant power levels, regardless of their capacity for plutonium production, are not considered as "zero energy reactors".

1.2. Reactor pressure vessels

Metal vessels, as complete units or as major shop-fabricated parts therefor, which are especially designed or prepared to contain the core of a nuclear reactor as defined in paragraph 1.1. above and are capable of withstanding the operating pressure of the primary coolant.

EXPLANATORY NOTE

A top plate for a reactor pressure vessel is covered by item 1.2. as a major shop-fabricated part of a pressure vessel.

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*/ This is the list which the Board agreed at its meeting on 24 February 1993 would be used for the purpose of the voluntary reporting scheme, as subsequently amended by the Board.

Reactor internals (e.g. support columns and plates for the core and other vessel internals, control rod guide tubes, thermal shields, baffles, core grid plates, diffuser plates, etc.) are normally supplied by the reactor supplier. In some cases, certain internal support components are included in the fabrication of the pressure vessel. These items are sufficiently critical to the safety and reliability of the operation of the reactor (and, therefore, to the guarantees and liability of the reactor supplier), so that their supply, outside the basic supply arrangement for the reactor itself, would not be common practice. Therefore, although the separate supply of these unique, especially designed and prepared, critical, large and expensive items would not necessarily be considered as falling outside the area of concern, such a mode of supply is considered unlikely.

1.3. Reactor fuel charging and discharging machines

Manipulative equipment especially designed or prepared for inserting or removing fuel in a nuclear reactor as defined in paragraph 1.1. above capable of on-load operation or employing technically sophisticated positioning or alignment features to allow complex off-load fuelling operations such as those in which direct viewing of or access to the fuel is not normally available.

1.4. Reactor control rods

Rods especially designed or prepared for the control of the reaction rate in a nuclear reactor as defined in paragraph 1.1. above.

EXPLANATORY NOTE

This item includes, in addition to the neutron absorbing part, the support or suspension structures therefor if supplied separately.

1.5. Reactor pressure tubes

Tubes which are especially designed or prepared to contain fuel elements and the primary coolant in a reactor as defined in paragraph 1.1. above at an operating pressure in excess of 5.1 MPa (740 psi).

1.6. Zirconium tubes

Zirconium metal and alloys in the form of tubes or assemblies of tubes, and in quantities exceeding 500 kg in any period of 12 months, especially designed or prepared for use in a reactor as defined in paragraph 1.1. above, and in which the relation of hafnium to zirconium is less than 1:500 parts by weight.

1.7. Primary coolant pumps

Pumps especially designed or prepared for circulating the primary coolant for nuclear reactors as defined in paragraph 1.1. above.

EXPLANATORY NOTE

Especially designed or prepared pumps may include elaborate sealed or multi-sealed systems to prevent leakage of primary coolant, canned-driven pumps, and pumps with inertial mass systems. This definition encompasses pumps certified to NC-1 or equivalent standards.

2. Non-nuclear materials for reactors

2.1. Deuterium and heavy water

Deuterium, heavy water (deuterium oxide) and any other deuterium compound in which the ratio of deuterium to hydrogen atoms exceeds 1:5000 for use in a nuclear reactor as defined in paragraph 1.1. above in quantities exceeding 200 kg of deuterium atoms for any one recipient country in any period of 12 months.

2.2. Nuclear grade graphite

Graphite having a purity level better than 5 parts per million boron equivalent and with a density greater than 1.50 g/cm^3 for use in a nuclear reactor as defined in paragraph 1.1. above in quantities exceeding 3 x 10^4 kg (30 metric tons) for any one recipient country in any period of 12 months.

NOTE

For the purpose of reporting, the Government will determine whether or not the exports of graphite meeting the above specifications are for nuclear reactor use.

3. Plants for the reprocessing of irradiated fuel elements, and equipment especially designed or prepared therefor

INTRODUCTORY NOTE

Reprocessing irradiated nuclear fuel separates plutonium and uranium from intensely radioactive fission products and other transuranic elements. Different technical processes can accomplish this separation. However, over the years Purex has become the most commonly used and accepted process. Purex involves the dissolution of irradiated nuclear fuel in nitric acid, followed by separation of the

uranium, plutonium, and fission products by solvent extraction using a mixture of tributyl phosphate in an organic diluent.

Purex facilities have process functions similar to each other, including: irradiated fuel element chopping, fuel dissolution, solvent extraction, and process liquor storage. There may also be equipment for thermal denitration of uranium nitrate, conversion of plutonium nitrate to oxide or metal, and treatment of fission product waste liquor to a form suitable for long term storage or disposal. However, the specific type and configuration of the equipment performing these functions may differ between Purex facilities for several reasons, including the type and quantity of irradiated nuclear fuel to be reprocessed and the intended disposition of the recovered materials, and the safety and maintenance philosophy incorporated into the design of the facility.

A "plant for the reprocessing of irradiated fuel elements" includes the equipment and components which normally come in direct contact with and directly control the irradiated fuel and the major nuclear material and fission product processing streams.

These processes, including the complete systems for plutonium conversion and plutonium metal production, may be identified by the measures taken to avoid criticality (e.g. by geometry), radiation exposure (e.g. by shielding), and toxicity hazards (e.g. by containment).

Items of equipment that are considered to fall within the meaning of the phrase "and equipment especially designed or prepared" for the reprocessing of irradiated fuel elements include:

3.1. Irradiated fuel element chopping machines

INTRODUCTORY NOTE

This equipment breaches the cladding of the fuel to expose the irradiated nuclear material to dissolution. Especially designed metal cutting shears are the most commonly employed, although advanced equipment, such as lasers, may be used.

Remotely operated equipment especially designed or prepared for use in a reprocessing plant as identified above and intended to cut, chop or shear irradiated nuclear fuel assemblies, bundles or rods.

3.2. Dissolvers

INTRODUCTORY NOTE

Dissolvers normally receive the chopped-up spent fuel. In these critically safe vessels, the irradiated nuclear material is dissolved in nitric acid and the remaining hulls removed from the process stream.

Critically safe tanks (e.g. small diameter, annular or slab tanks) especially designed or prepared for use in a reprocessing plant as identified above, intended for dissolution of irradiated nuclear fuel and which are capable of withstanding hot, highly corrosive liquid, and which can be remotely loaded and maintained.

3.3. Solvent extractors and solvent extraction equipment

INTRODUCTORY NOTE

Solvent extractors both receive the solution of irradiated fuel from the dissolvers and the organic solution which separates the uranium, plutonium, and fission products. Solvent extraction equipment is normally designed to meet strict operating parameters, such as long operating lifetimes with no maintenance requirements or adaptability to easy replacement, simplicity of operation and control, and flexibility for variations in process conditions.

Especially designed or prepared solvent extractors such as packed or pulse columns, mixer settlers or centrifugal contactors for use in a plant for the reprocessing of irradiated fuel. Solvent extractors must be resistant to the corrosive effect of nitric acid. Solvent extractors are normally fabricated to extremely high standards (including special welding and inspection and quality assurance and quality control techniques) out of low carbon stainless steels, titanium, zirconium, or other high quality materials.

3.4. Chemical holding or storage vessels

INTRODUCTORY NOTE

Three main process liquor streams result from the solvent extraction step. Holding or storage vessels are used in the further processing of all three streams, as follows:

(a) The pure uranium nitrate solution is concentrated by evaporation and passed to a denitration process where it is converted to uranium oxide. This oxide is re-used in the nuclear fuel cycle.

(b) The intensely radioactive fission products solution is normally concentrated by evaporation and stored as a liquor concentrate. This concentrate may be subsequently evaporated and converted to a form suitable for storage or disposal.

(c) The pure plutonium nitrate solution is concentrated and stored pending its transfer to further process steps. In particular, holding or storage vessels for plutonium solutions are designed to avoid criticality problems resulting from changes in concentration and form of this stream.

Especially designed or prepared holding or storage vessels for use in a plant for the reprocessing of irradiated fuel. The holding or storage vessels must be resistant to the corrosive effect of nitric acid. The holding or storage vessels are normally fabricated of materials such as low carbon stainless steels, titanium or zirconium, or other high quality materials. Holding or storage vessels may be designed for remote operation and maintenance and may have the following features for control of nuclear criticality:

(1) walls or internal structures with a boron equivalent of at least two per cent, or

(2) a maximum diameter of 175 mm (7 in) for cylindrical vessels, or

(3) a maximum width of 75 mm (3 in) for either a slab or annular vessel.

3.5. Plutonium nitrate to oxide conversion system

INTRODUCTORY NOTE

In most reprocessing facilities, this final process involves the conversion of the plutonium nitrate solution to plutonium dioxide. The main functions involved in this process are: process feed storage and adjustment, precipitation and solid/liquor separation, calcination, product handling, ventilation, waste management, and process control.

Complete systems especially designed or prepared for the conversion of plutonium nitrate to plutonium oxide, in particular adapted so as to avoid criticality and radiation effects and to minimize toxicity hazards.

3.6. Plutonium oxide to metal production system

INTRODUCTORY NOTE

This process, which could be related to a reprocessing facility, involves the fluorination of plutonium dioxide, normally with highly corrosive hydrogen fluoride, to produce plutonium fluoride which is subsequently reduced using high purity calcium metal to produce metallic plutonium and a calcium fluoride slag. The main

functions involved in this process are: fluorination (e.g. involving equipment fabricated or lined with a precious metal), metal reduction (e.g. employing ceramic crucibles), slag recovery, product handling, ventilation, waste management and process control.

Complete systems especially designed or prepared for the production of plutonium metal, in particular adapted so as to avoid criticality and radiation effects and to minimize toxicity hazards.

4. Plants for the fabrication of fuel elements

A "plant for the fabrication of fuel elements" includes the equipment:

(a) Which normally comes in direct contact with, or directly processes, or controls, the production flow of nuclear material, or

(b) Which seals the nuclear material within the cladding.

5. Plants for the separation of isotopes of uranium and equipment, other than analytical instruments, especially designed or prepared therefor

Items of equipment that are considered to fall within the meaning of the phrase "equipment, other than analytical instruments, especially designed or prepared" for the separation of isotopes of uranium include:

5.1. Gas centrifuges and assemblies and components especially designed or prepared for use in gas centrifuges

INTRODUCTORY NOTE

The gas centrifuge normally consists of a thin-walled cylinder(s) of between 75 mm (3 in) and 400 mm (16 in) diameter contained in a vacuum environment and spun at high peripheral speed of the order of 300 m/s or more with its central axis vertical. In order to achieve high speed the materials of construction for the rotating components have to be of a high strength to density ratio and the rotor assembly, and hence its individual components, have to be manufactured to very close tolerances in order to minimize the unbalance. In contrast to other centrifuges, the gas centrifuge for uranium enrichment is characterized by having within the rotor chamber a rotating disc-shaped baffle(s) and a stationary tube arrangement for feeding and extracting the UF_6 gas and featuring at least 3 separate channels, of which 2 are connected to scoops extending from the rotor axis towards the periphery of the rotor chamber. Also contained within the vacuum environment are a number of critical items which do not rotate and which although they are especially designed are not difficult to fabricate nor are they fabricated out of unique materials. A

centrifuge facility however requires a large number of these components, so that quantities can provide an important indication of end use.

5.1.1. Rotating components

(a) Complete rotor assemblies:

Thin-walled cylinders, or a number of interconnected thin-walled cylinders, manufactured from one or more of the high strength to density ratio materials described in the EXPLANATORY NOTE to this Section. If interconnected, the cylinders are joined together by flexible bellows or rings as described in section 5.1.1.(c) following. The rotor is fitted with an internal baffle(s) and end caps, as described in section 5.1.1.(d) and (e) following, if in final form. However the complete assembly may be delivered only partly assembled.

(b) Rotor tubes:

Especially designed or prepared thin-walled cylinders with thickness of 12 mm (0.5 in) or less, a diameter of between 75 mm (3 in) and 400 mm (16 in), and manufactured from one or more of the high strength to density ratio materials described in the EXPLANATORY NOTE to this Section.

(c) Rings or Bellows:

Components especially designed or prepared to give localized support to the rotor tube or to join together a number of rotor tubes. The bellows is a short cylinder of wall thickness 3 mm (0.12 in) or less, a diameter of between 75 mm (3 in) and 400 mm (16 in), having a convolute, and manufactured from one of the high strength to density ratio materials described in the EXPLANATORY NOTE to this Section.

(d) Baffles:

Disc-shaped components of between 75 mm (3 in) and 400 mm (16 in) diameter especially designed or prepared to be mounted inside the centrifuge rotor tube, in order to isolate the take-off chamber from the main separation chamber and, in some cases, to assist the UF_6 gas circulation within the main separation chamber of the rotor tube, and manufactured from one of the high strength to density ratio materials described in the EXPLANATORY NOTE to this Section.

(e) Top caps/Bottom caps:

Disc-shaped components of between 75 mm (3 in) and 400 mm (16 in) diameter especially designed or prepared to fit to the ends of the rotor tube, and so contain the UF_6 within the rotor tube, and in some cases to support, retain or contain as an integrated part an element of the upper bearing (top cap) or to carry the rotating elements of the motor and lower bearing (bottom cap), and manufactured from one

of the high strength to density ratio materials described in the EXPLANATORY NOTE to this Section.

EXPLANATORY NOTE

The materials used for centrifuge rotating components are:

(a) Maraging steel capable of an ultimate tensile strength of 2.05×10^9 N/m^2 (300,000 psi) or more;

(b) Aluminium alloys capable of an ultimate tensile strength of 0.46×10^9 N/m^2 (67,000 psi) or more;

(c) Filamentary materials suitable for use in composite structures and having a specific modulus of 12.3×10^6 m or greater and a specific ultimate tensile strength of 0.3×10^6 m or greater ('Specific Modulus' is the Young's Modulus in N/m^2 divided by the specific weight in N/m^3; 'Specific Ultimate Tensile Strength' is the ultimate tensile strength in N/m^2 divided by the specific weight in N/m^3).

5.1.2. Static components

(a) Magnetic suspension bearings:

Especially designed or prepared bearing assemblies consisting of an annular magnet suspended within a housing containing a damping medium. The housing will be manufactured from a UF_6-resistant material (see EXPLANATORY NOTE to Section 5.2.). The magnet couples with a pole piece or a second magnet fitted to the top cap described in Section 5.1.1.(e). The magnet may be ring-shaped with a relation between outer and inner diameter smaller or equal to 1.6:1. The magnet may be in a form having an initial permeability of 0.15 H/m (120,000 in CGS units) or more, or a remanence of 98.5% or more, or an energy product of greater than 80 kJ/m^3 (10^7 gauss-oersteds). In addition to the usual material properties, it is a prerequisite that the deviation of the magnetic axes from the geometrical axes is limited to very small tolerances (lower than 0.1 mm or 0.004 in) or that homogeneity of the material of the magnet is specially called for.

(b) Bearings/Dampers:

Especially designed or prepared bearings comprising a pivot/cup assembly mounted on a damper. The pivot is normally a hardened steel shaft with a hemisphere at one end with a means of attachment to the bottom cap described in section 5.1.1.(e) at the other. The shaft may however have a hydrodynamic bearing attached. The cup is pellet-shaped with a hemispherical indentation in one surface. These components are often supplied separately to the damper.

(c) Molecular pumps:

Especially designed or prepared cylinders having internally machined or extruded helical grooves and internally machined bores. Typical dimensions are as follows: 75 mm (3 in) to 400 mm (16 in) internal diameter, 10 mm (0.4 in) or more wall thickness, with the length equal to or greater than the diameter. The grooves are typically rectangular in cross-section and 2 mm (0.08 in) or more in depth.

(d) Motor stators:

Especially designed or prepared ring-shaped stators for high speed multiphase AC hysteresis (or reluctance) motors for synchronous operation within a vacuum in the frequency range of 600 - 2000 Hz and a power range of 50 - 1000 VA. The stators consist of multi-phase windings on a laminated low loss iron core comprised of thin layers typically 2.0 mm (0.08 in) thick or less.

(e) Centrifuge housing/recipients:

Components especially designed or prepared to contain the rotor tube assembly of a gas centrifuge. The housing consists of a rigid cylinder of wall thickness up to 30 mm (1.2 in) with precision machined ends to locate the bearings and with one or more flanges for mounting. The machined ends are parallel to each other and perpendicular to the cylinder's longitudinal axis to within 0.05 degrees or less. The housing may also be a honeycomb type structure to accommodate several rotor tubes. The housings are made of or protected by materials resistant to corrosion by UF_6.

(f) Scoops:

Especially designed or prepared tubes of up to 12 mm (0.5 in) internal diameter for the extraction of UF_6 gas from within the rotor tube by a Pitot tube action (that is, with an aperture facing into the circumferential gas flow within the rotor tube, for example by bending the end of a radially disposed tube) and capable of being fixed to the central gas extraction system. The tubes are made of or protected by materials resistant to corrosion by UF_6.

5.2. Especially designed or prepared auxiliary systems, equipment and components for gas centrifuge enrichment plants

INTRODUCTORY NOTE

The auxiliary systems, equipment and components for a gas centrifuge enrichment plant are the systems of plant needed to feed UF_6 to the centrifuges, to link the individual centrifuges to each other to form cascades (or stages) to allow for progressively higher enrichments and to extract the 'product' and 'tails' UF_6 from

the centrifuges, together with the equipment required to drive the centrifuges or to control the plant.

Normally UF_6 is evaporated from the solid using heated autoclaves and is distributed in gaseous form to the centrifuges by way of cascade header pipework. The 'product' and 'tails' UF_6 gaseous streams flowing from the centrifuges are also passed by way of cascade header pipework to cold traps (operating at about 203 K (-70 °C)) where they are condensed prior to onward transfer into suitable containers for transportation or storage. Because an enrichment plant consists of many thousands of centrifuges arranged in cascades there are many kilometers of cascade header pipework, incorporating thousands of welds with a substantial amount of repetition of layout. The equipment, components and piping systems are fabricated to very high vacuum and cleanliness standards.

5.2.1. Feed systems/product and tails withdrawal systems

Especially designed or prepared process systems including:

Feed autoclaves (or stations), used for passing UF_6 to the centrifuge cascades at up to 100 kPa (15 psi) and at a rate of 1 kg/h or more;

Desublimers (or cold traps) used to remove UF_6 from the cascades at up to 3 kPa (0.5 psi) pressure. The desublimers are capable of being chilled to 203 K (-70 °C) and heated to 343 K (70 °C);

'Product' and 'Tails' stations used for trapping UF_6 into containers.

This plant, equipment and pipework is wholly made of or lined with UF_6-resistant materials (see EXPLANATORY NOTE to this section) and is fabricated to very high vacuum and cleanliness standards.

5.2.2. Machine header piping systems

Especially designed or prepared piping systems and header systems for handling UF_6 within the centrifuge cascades. The piping network is normally of the 'triple' header system with each centrifuge connected to each of the headers. There is thus a substantial amount of repetition in its form. It is wholly made of UF_6-resistant materials (see EXPLANATORY NOTE to this section) and is fabricated to very high vacuum and cleanliness standards.

5.2.3. UF_6 mass spectrometers/ion sources

Especially designed or prepared magnetic or quadrupole mass spectrometers capable of taking 'on-line' samples of feed, product or tails, from UF_6 gas streams and having all of the following characteristics:

1. Unit resolution for atomic mass unit greater than 320;

2. Ion sources constructed of or lined with nichrome or monel or nickel plated;

3. Electron bombardment ionization sources;

4. Having a collector system suitable for isotopic analysis.

5.2.4. Frequency changers

Frequency changers (also known as converters or invertors) especially designed or prepared to supply motor stators as defined under 5.1.2.(d), or parts, components and sub-assemblies of such frequency changers having all of the following characteristics:

1. A multiphase output of 600 to 2000 Hz;

2. High stability (with frequency control better than 0.1%);

3. Low harmonic distortion (less than 2%); and

4. An efficiency of greater than 80%.

EXPLANATORY NOTE

The items listed above either come into direct contact with the UF_6 process gas or directly control the centrifuges and the passage of the gas from centrifuge to centrifuge and cascade to cascade.

Materials resistant to corrosion by UF_6 include stainless steel, aluminium, aluminium alloys, nickel or alloys containing 60% or more nickel.

5.3. Especially designed or prepared assemblies and components for use in gaseous diffusion enrichment

INTRODUCTORY NOTE

In the gaseous diffusion method of uranium isotope separation, the main technological assembly is a special porous gaseous diffusion barrier, heat exchanger for cooling the gas (which is heated by the process of compression), seal valves and control valves, and pipelines. Inasmuch as gaseous diffusion technology uses uranium hexafluoride (UF_6), all equipment, pipeline and instrumentation surfaces (that come in contact with the gas) must be made of materials that remain stable in contact with UF_6. A gaseous diffusion facility requires a number of these assemblies, so that quantities can provide an important indication of end use.

5.3.1. Gaseous diffusion barriers

(a) Especially designed or prepared thin, porous filters, with a pore size of 100 - 1,000 Å (angstroms), a thickness of 5 mm (0.2 in) or less, and for tubular forms, a diameter of 25 mm (1 in) or less, made of metallic, polymer or ceramic materials resistant to corrosion by UF_6, and

(b) especially prepared compounds or powders for the manufacture of such filters. Such compounds and powders include nickel or alloys containing 60 per cent or more nickel, aluminium oxide, or UF_6-resistant fully fluorinated hydrocarbon polymers having a purity of 99.9 per cent or more, a particle size less than 10 microns, and a high degree of particle size uniformity, which are especially prepared for the manufacture of gaseous diffusion barriers.

5.3.2. Diffuser housings

Especially designed or prepared hermetically sealed cylindrical vessels greater than 300 mm (12 in) in diameter and greater than 900 mm (35 in) in length, or rectangular vessels of comparable dimensions, which have an inlet connection and two outlet connections all of which are greater than 50 mm (2 in) in diameter, for containing the gaseous diffusion barrier, made of or lined with UF_6-resistant materials and designed for horizontal or vertical installation.

5.3.3. Compressors and gas blowers

Especially designed or prepared axial, centrifugal, or positive displacement compressors, or gas blowers with a suction volume capacity of 1 m^3/min or more of UF_6, and with a discharge pressure of up to several hundred kPa (100 psi), designed for long-term operation in the UF_6 environment with or without an electrical motor of appropriate power, as well as separate assemblies of such compressors and gas blowers. These compressors and gas blowers have a pressure ratio between 2:1 and 6:1 and are made of, or lined with, materials resistant to UF_6.

5.3.4. Rotary shaft seals

Especially designed or prepared vacuum seals, with seal feed and seal exhaust connections, for sealing the shaft connecting the compressor or the gas blower rotor with the driver motor so as to ensure a reliable seal against in-leaking of air into the inner chamber of the compressor or gas blower which is filled with UF_6. Such seals are normally designed for a buffer gas in-leakage rate of less than 1000 cm^3/min (60 in^3/min).

5.3.5. Heat exchangers for cooling UF_6

Especially designed or prepared heat exchangers made of or lined with UF_6-resistant materials (except stainless steel) or with copper or any combination of those metals, and intended for a leakage pressure change rate of less than 10 Pa (0.0015 psi) per hour under a pressure difference of 100 kPa (15 psi).

5.4. Especially designed or prepared auxiliary systems, equipment and components for use in gaseous diffusion enrichment

INTRODUCTORY NOTE

The auxiliary systems, equipment and components for gaseous diffusion enrichment plants are the systems of plant needed to feed UF_6 to the gaseous diffusion assembly, to link the individual assemblies to each other to form cascades (or stages) to allow for progressively higher enrichments and to extract the 'product' and 'tails' UF_6 from the diffusion cascades. Because of the high inertial properties of diffusion cascades, any interruption in their operation, and especially their shut-down, leads to serious consequences. Therefore, a strict and constant maintenance of vacuum in all technological systems, automatic protection from accidents, and precise automated regulation of the gas flow is of importance in a gaseous diffusion plant. All this leads to a need to equip the plant with a large number of special measuring, regulating and controlling systems.

Normally UF_6 is evaporated from cylinders placed within autoclaves and is distributed in gaseous form to the entry point by way of cascade header pipework. The 'product' and 'tails' UF_6 gaseous streams flowing from exit points are passed by way of cascade header pipework to either cold traps or to compression stations where the UF_6 gas is liquefied prior to onward transfer into suitable containers for transportation or storage. Because a gaseous diffusion enrichment plant consists of a large number of gaseous diffusion assemblies arranged in cascades, there are many kilometers of cascade header pipework, incorporating thousands of welds with substantial amounts of repetition of layout. The equipment, components and piping systems are fabricated to very high vacuum and cleanliness standards.

5.4.1. Feed systems/product and tails withdrawal systems

Especially designed or prepared process systems, capable of operating at pressures of 300 kPa (45 psi) or less, including:

Feed autoclaves (or systems), used for passing UF_6 to the gaseous diffusion cascades;

Desublimers (or cold traps) used to remove UF_6 from diffusion cascades;

Liquefaction stations where UF_6 gas from the cascade is compressed and cooled to form liquid UF_6;

'Product' or 'tails' stations used for transferring UF_6 into containers.

5.4.2. Header piping systems

Especially designed or prepared piping systems and header systems for handling UF_6 within the gaseous diffusion cascades. This piping network is normally of the "double" header system with each cell connected to each of the headers.

5.4.3. Vacuum systems

(a) Especially designed or prepared large vacuum manifolds, vacuum headers and vacuum pumps having a suction capacity of 5 m^3/min (175 ft^3/min) or more.

(b) Vacuum pumps especially designed for service in UF_6-bearing atmospheres made of, or lined with, aluminium, nickel, or alloys bearing more than 60% nickel. These pumps may be either rotary or positive, may have displacement and fluorocarbon seals, and may have special working fluids present.

5.4.4. Special shut-off and control valves

Especially designed or prepared manual or automated shut-off and control bellows valves made of UF_6-resistant materials with a diameter of 40 to 1500 mm (1.5 to 59 in) for installation in main and auxiliary systems of gaseous diffusion enrichment plants.

5.4.5. UF_6 mass spectrometers/ion sources

Especially designed or prepared magnetic or quadrupole mass spectrometers capable of taking "on-line" samples of feed, product or tails, from UF_6 gas streams and having all of the following characteristics:

1. Unit resolution for atomic mass unit greater than 320;

2. Ion sources constructed of or lined with nichrome or monel or nickel plated;

3. Electron bombardment ionization sources;

4. Collector system suitable for isotopic analysis.

EXPLANATORY NOTE

The items listed above either come into direct contact with the UF_6 process gas or directly control the flow within the cascade. All surfaces which come into contact with the process gas are wholly made of, or lined with, UF_6-resistant materials. For the purposes of the sections relating to gaseous diffusion items the materials resistant to corrosion by UF_6 include stainless steel, aluminium, aluminium alloys, aluminium oxide, nickel or alloys containing 60% or more nickel and UF_6-resistant fully fluorinated hydrocarbon polymers.

5.5. Especially designed or prepared systems, equipment and components for use in aerodynamic enrichment plants

INTRODUCTORY NOTE

In aerodynamic enrichment processes, a mixture of gaseous UF_6 and light gas (hydrogen or helium) is compressed and then passed through separating elements wherein isotopic separation is accomplished by the generation of high centrifugal forces over a curved-wall geometry. Two processes of this type have been successfully developed: the separation nozzle process and the vortex tube process. For both processes the main components of a separation stage include cylindrical vessels housing the special separation elements (nozzles or vortex tubes), gas compressors and heat exchangers to remove the heat of compression. An aerodynamic plant requires a number of these stages, so that quantities can provide an important indication of end use. Since aerodynamic processes use UF_6, all equipment, pipeline and instrumentation surfaces (that come in contact with the gas) must be made of materials that remain stable in contact with UF_6.

EXPLANATORY NOTE

The items listed in this section either come into direct contact with the UF_6 process gas or directly control the flow within the cascade. All surfaces which come into contact with the process gas are wholly made of or protected by UF_6-resistant materials. For the purposes of the section relating to aerodynamic enrichment items, the materials resistant to corrosion by UF_6 include copper, stainless steel, aluminium, aluminium alloys, nickel or alloys containing 60% or more nickel and UF_6-resistant fully fluorinated hydrocarbon polymers.

5.5.1. Separation nozzles

Especially designed or prepared separation nozzles and assemblies thereof. The separation nozzles consist of slit-shaped, curved channels having a radius of curvature less than 1 mm (typically 0.1 to 0.05 mm), resistant to corrosion by UF_6 and having a knife-edge within the nozzle that separates the gas flowing through the nozzle into two fractions.

5.5.2. Vortex tubes

Especially designed or prepared vortex tubes and assemblies thereof. The vortex tubes are cylindrical or tapered, made of or protected by materials resistant to corrosion by UF_6, having a diameter of between 0.5 cm and 4 cm, a length to diameter ratio of 20:1 or less and with one or more tangential inlets. The tubes may be equipped with nozzle-type appendages at either or both ends.

EXPLANATORY NOTE

The feed gas enters the vortex tube tangentially at one end or through swirl vanes or at numerous tangential positions along the periphery of the tube.

5.5.3. Compressors and gas blowers

Especially designed or prepared axial, centrifugal or positive displacement compressors or gas blowers made of or protected by materials resistant to corrosion by UF_6 and with a suction volume capacity of 2 m^3/min or more of UF_6/carrier gas (hydrogen or helium) mixture.

EXPLANATORY NOTE

These compressors and gas blowers typically have a pressure ratio between 1.2:1 and 6:1.

5.5.4. Rotary shaft seals

Especially designed or prepared rotary shaft seals, with seal feed and seal exhaust connections, for sealing the shaft connecting the compressor rotor or the gas blower rotor with the driver motor so as to ensure a reliable seal against out-leakage of process gas or in-leakage of air or seal gas into the inner chamber of the compressor or gas blower which is filled with a UF_6/carrier gas mixture.

5.5.5. Heat exchangers for gas cooling

Especially designed or prepared heat exchangers made of or protected by materials resistant to corrosion by UF_6.

5.5.6. Separation element housings

Especially designed or prepared separation element housings, made of or protected by materials resistant to corrosion by UF_6, for containing vortex tubes or separation nozzles.

EXPLANATORY NOTE

These housings may be cylindrical vessels greater than 300 mm in diameter and greater than 900 mm in length, or may be rectangular vessels of comparable dimensions, and may be designed for horizontal or vertical installation.

5.5.7. Feed systems/product and tails withdrawal systems

Especially designed or prepared process systems or equipment for enrichment plants made of or protected by materials resistant to corrosion by UF_6, including:

(a) Feed autoclaves, ovens, or systems used for passing UF_6 to the enrichment process;

(b) Desublimers (or cold traps) used to remove UF_6 from the enrichment process for subsequent transfer upon heating;

(c) Solidification or liquefaction stations used to remove UF_6 from the enrichment process by compressing and converting UF_6 to a liquid or solid form;

(d) 'Product' or 'tails' stations used for transferring UF_6 into containers.

5.5.8. Header piping systems

Especially designed or prepared header piping systems, made of or protected by materials resistant to corrosion by UF_6, for handling UF_6 within the aerodynamic cascades. This piping network is normally of the 'double' header design with each stage or group of stages connected to each of the headers.

5.5.9. Vacuum systems and pumps

(a) Especially designed or prepared vacuum systems having a suction capacity of 5 m^3/min or more, consisting of vacuum manifolds, vacuum headers and vacuum pumps, and designed for service in UF_6-bearing atmospheres,

(b) Vacuum pumps especially designed or prepared for service in UF_6-bearing atmospheres and made of or protected by materials resistant to corrosion by UF_6. These pumps may use fluorocarbon seals and special working fluids.

5.5.10. Special shut-off and control valves

Especially designed or prepared manual or automated shut-off and control bellows valves made of or protected by materials resistant to corrosion by UF_6 with a diameter of 40 to 1500 mm for installation in main and auxiliary systems of aerodynamic enrichment plants.

5.5.11. UF_6 mass spectrometers/ion sources

Especially designed or prepared magnetic or quadrupole mass spectrometers capable of taking 'on-line' samples of feed, 'product' or 'tails', from UF_6 gas streams and having all of the following characteristics:

1. Unit resolution for mass greater than 320;

2. Ion sources constructed of or lined with nichrome or monel or nickel plated;

3. Electron bombardment ionization sources;

4. Collector system suitable for isotopic analysis.

5.5.12. UF_6/carrier gas separation systems

Especially designed or prepared process systems for separating UF_6 from carrier gas (hydrogen or helium).

EXPLANATORY NOTE

These systems are designed to reduce the UF_6 content in the carrier gas to 1 ppm or less and may incorporate equipment such as:

(a) Cryogenic heat exchangers and cryoseparators capable of temperatures of -120 °C or less, or

(b) Cryogenic refrigeration units capable of temperatures of -120 °C or less, or

(c) Separation nozzle or vortex tube units for the separation of UF_6 from carrier gas, or

(d) UF_6 cold traps capable of temperatures of -20 °C or less.

5.6. Especially designed or prepared systems, equipment and components for use in chemical exchange or ion exchange enrichment plants

INTRODUCTORY NOTE

The slight difference in mass between the isotopes of uranium causes small changes in chemical reaction equilibria that can be used as a basis for separation of the isotopes. Two processes have been successfully developed: liquid-liquid chemical exchange and solid-liquid ion exchange.

In the liquid-liquid chemical exchange process, immiscible liquid phases (aqueous and organic) are countercurrently contacted to give the cascading effect of thousands of separation stages. The aqueous phase consists of uranium chloride in hydrochloric acid solution; the organic phase consists of an extractant containing uranium chloride in an organic solvent. The contactors employed in the separation cascade can be liquid-liquid exchange columns (such as pulsed columns with sieve plates) or liquid centrifugal contactors. Chemical conversions (oxidation and reduction) are required at both ends of the separation cascade in order to provide for the reflux requirements at each end. A major design concern is to avoid contamination of the process streams with certain metal ions. Plastic, plastic-lined (including use of fluorocarbon polymers) and/or glass-lined columns and piping are therefore used.

In the solid-liquid ion-exchange process, enrichment is accomplished by uranium adsorption/desorption on a special, very fast-acting, ion-exchange resin or adsorbent. A solution of uranium in hydrochloric acid and other chemical agents is passed through cylindrical enrichment columns containing packed beds of the adsorbent. For a continuous process, a reflux system is necessary to release the uranium from the adsorbent back into the liquid flow so that 'product' and 'tails' can be collected. This is accomplished with the use of suitable reduction/oxidation chemical agents that are fully regenerated in separate external circuits and that may be partially regenerated within the isotopic separation columns themselves. The presence of hot concentrated hydrochloric acid solutions in the process requires that the equipment be made of or protected by special corrosion-resistant materials.

5.6.1. Liquid-liquid exchange columns (Chemical exchange)

Countercurrent liquid-liquid exchange columns having mechanical power input (i.e., pulsed columns with sieve plates, reciprocating plate columns, and columns with internal turbine mixers), especially designed or prepared for uranium enrichment using the chemical exchange process. For corrosion resistance to concentrated hydrochloric acid solutions, these columns and their internals are made of or protected by suitable plastic materials (such as fluorocarbon polymers) or glass. The stage residence time of the columns is designed to be short (30 seconds or less).

5.6.2. Liquid-liquid centrifugal contactors (Chemical exchange)

Liquid-liquid centrifugal contactors especially designed or prepared for uranium enrichment using the chemical exchange process. Such contactors use rotation to achieve dispersion of the organic and aqueous streams and then centrifugal force to separate the phases. For corrosion resistance to concentrated hydrochloric acid solutions, the contactors are made of or are lined with suitable plastic materials (such as fluorocarbon polymers) or are lined with glass. The stage residence time of the centrifugal contactors is designed to be short (30 seconds or less).

5.6.3. Uranium reduction systems and equipment (Chemical exchange)

(a) Especially designed or prepared electrochemical reduction cells to reduce uranium from one valence state to another for uranium enrichment using the chemical exchange process. The cell materials in contact with process solutions must be corrosion resistant to concentrated hydrochloric acid solutions.

EXPLANATORY NOTE

The cell cathodic compartment must be designed to prevent re-oxidation of uranium to its higher valence state. To keep the uranium in the cathodic compartment, the cell may have an impervious diaphragm membrane constructed of special cation exchange material. The cathode consists of a suitable solid conductor such as graphite.

(b) Especially designed or prepared systems at the product end of the cascade for taking the U^{4+} out of the organic stream, adjusting the acid concentration and feeding to the electrochemical reduction cells.

EXPLANATORY NOTE

These systems consist of solvent extraction equipment for stripping the U^{4+} from the organic stream into an aqueous solution, evaporation and/or other equipment to accomplish solution pH adjustment and control, and pumps or other transfer devices for feeding to the electrochemical reduction cells. A major design concern is to avoid contamination of the aqueous stream with certain metal ions. Consequently, for those parts in contact with the process stream, the system is constructed of equipment made of or protected by suitable materials (such as glass, fluorocarbon polymers, polyphenyl sulfate, polyether sulfone, and resin-impregnated graphite).

5.6.4. Feed preparation systems (Chemical exchange)

Especially designed or prepared systems for producing high-purity uranium chloride feed solutions for chemical exchange uranium isotope separation plants.

EXPLANATORY NOTE

These systems consist of dissolution, solvent extraction and/or ion exchange equipment for purification and electrolytic cells for reducing the uranium U^{6+} or U^{4+} to U^{3+}. These systems produce uranium chloride solutions having only a few parts per million of metallic impurities such as chromium, iron, vanadium, molybdenum and other bivalent or higher multi-valent cations. Materials of construction for portions of the system processing high-purity U^{3+} include glass, fluorocarbon polymers, polyphenyl sulfate or polyether sulfone plastic-lined and resin-impregnated graphite.

5.6.5. Uranium oxidation systems (Chemical exchange)

Especially designed or prepared systems for oxidation of U^{3+} to U^{4+} for return to the uranium isotope separation cascade in the chemical exchange enrichment process.

EXPLANATORY NOTE

These systems may incorporate equipment such as:

(a) Equipment for contacting chlorine and oxygen with the aqueous effluent from the isotope separation equipment and extracting the resultant U^{4+} into the stripped organic stream returning from the product end of the cascade,

(b) Equipment that separates water from hydrochloric acid so that the water and the concentrated hydrochloric acid may be reintroduced to the process at the proper locations.

5.6.6. Fast-reacting ion exchange resins/adsorbents (ion exchange)

Fast-reacting ion-exchange resins or adsorbents especially designed or prepared for uranium enrichment using the ion exchange process, including porous macroreticular resins, and/or pellicular structures in which the active chemical exchange groups are limited to a coating on the surface of an inactive porous support structure, and other composite structures in any suitable form including particles or fibers. These ion exchange resins/adsorbents have diameters of 0.2 mm or less and must be chemically resistant to concentrated hydrochloric acid solutions as well as physically strong enough so as not to degrade in the exchange columns. The resins/adsorbents are especially designed to achieve very fast uranium isotope exchange kinetics (exchange rate half-time of less than 10 seconds) and are capable of operating at a temperature in the range of 100 °C to 200 °C.

5.6.7. Ion exchange columns (Ion exchange)

Cylindrical columns greater than 1000 mm in diameter for containing and supporting packed beds of ion exchange resin/adsorbent, especially designed or prepared for uranium enrichment using the ion exchange process. These columns are made of or protected by materials (such as titanium or fluorocarbon plastics) resistant to corrosion by concentrated hydrochloric acid solutions and are capable of operating at a temperature in the range of 100 °C to 200 °C and pressures above 0.7 MPa (102 psia).

5.6.8. Ion exchange reflux systems (Ion exchange)

(a) Especially designed or prepared chemical or electrochemical reduction systems for regeneration of the chemical reducing agent(s) used in ion exchange uranium enrichment cascades.

(b) Especially designed or prepared chemical or electrochemical oxidation systems for regeneration of the chemical oxidizing agent(s) used in ion exchange uranium enrichment cascades.

EXPLANATORY NOTE

The ion exchange enrichment process may use, for example, trivalent titanium (Ti^{3+}) as a reducing cation in which case the reduction system would regenerate Ti^{3+} by reducing Ti^{4+}.

The process may use, for example, trivalent iron (Fe^{3+}) as an oxidant in which case the oxidation system would regenerate Fe^{3+} by oxidizing Fe^{2+}.

5.7. Especially designed or prepared systems, equipment and components for use in laser-based enrichment plants

INTRODUCTORY NOTE

Present systems for enrichment processes using lasers fall into two categories: those in which the process medium is atomic uranium vapor and those in which the process medium is the vapor of a uranium compound. Common nomenclature for such processes include: first category - atomic vapor laser isotope separation (AVLIS or SILVA); second category - molecular laser isotope separation (MLIS or MOLIS) and chemical reaction by isotope selective laser activation (CRISLA). The systems, equipment and components for laser enrichment plants embrace: (a) devices to feed uranium-metal vapor (for selective photo-ionization) or devices to feed the vapor of a uranium compound (for photo-dissociation or chemical activation); (b) devices to collect enriched and depleted uranium metal as 'product' and 'tails' in the first category, and devices to collect dissociated or reacted compounds as 'product' and unaffected material as 'tails' in the second category; (c) process laser systems to selectively excite the uranium-235 species; and (d) feed preparation and product conversion equipment. The complexity of the spectroscopy of uranium atoms and compounds may require incorporation of any of a number of available laser technologies.

EXPLANATORY NOTE

Many of the items listed in this section come into direct contact with uranium metal vapor or liquid or with process gas consisting of UF_6 or a mixture of UF_6 and other gases. All surfaces that come into contact with the uranium or UF_6 are wholly made of or protected by corrosion-resistant materials. For the purposes of the section relating to laser-based enrichment items, the materials resistant to corrosion by the vapor or liquid of uranium metal or uranium alloys include yttria-coated graphite and tantalum; and the materials resistant to corrosion by UF_6 include copper, stainless steel, aluminium, aluminium alloys, nickel or alloys containing 60 % or more nickel and UF_6-resistant fully fluorinated hydrocarbon polymers.

5.7.1. Uranium vaporization systems (AVLIS)

Especially designed or prepared uranium vaporization systems which contain high-power strip or scanning electron beam guns with a delivered power on the target of more than 2.5 kW/cm.

5.7.2. Liquid uranium metal handling systems (AVLIS)

Especially designed or prepared liquid metal handling systems for molten uranium or uranium alloys, consisting of crucibles and cooling equipment for the crucibles.

EXPLANATORY NOTE

The crucibles and other parts of this system that come into contact with molten uranium or uranium alloys are made of or protected by materials of suitable corrosion and heat resistance. Suitable materials include tantalum, yttria-coated graphite, graphite coated with other rare earth oxides or mixtures thereof.

5.7.3. Uranium metal 'product' and 'tails' collector assemblies (AVLIS)

Especially designed or prepared 'product' and 'tails' collector assemblies for uranium metal in liquid or solid form.

EXPLANATORY NOTE

Components for these assemblies are made of or protected by materials resistant to the heat and corrosion of uranium metal vapor or liquid (such as yttria-coated graphite or tantalum) and may include pipes, valves, fittings, 'gutters', feed-throughs, heat exchangers and collector plates for magnetic, electrostatic or other separation methods.

5.7.4. Separator module housings (AVLIS)

Especially designed or prepared cylindrical or rectangular vessels for containing the uranium metal vapor source, the electron beam gun, and the 'product' and 'tails' collectors.

EXPLANATORY NOTE

These housings have multiplicity of ports for electrical and water feed-throughs, laser beam windows, vacuum pump connections and instrumentation diagnostics and monitoring. They have provisions for opening and closure to allow refurbishment of internal components.

5.7.5. Supersonic expansion nozzles (MLIS)

Especially designed or prepared supersonic expansion nozzles for cooling mixtures of UF_6 and carrier gas to 150 K or less and which are corrosion resistant to UF_6.

5.7.6. Uranium pentafluoride product collectors (MLIS)

Especially designed or prepared uranium pentafluoride (UF_5) solid product collectors consisting of filter, impact, or cyclone-type collectors, or combinations thereof, and which are corrosion resistant to the UF_5/UF_6 environment.

5.7.7. UF_6/carrier gas compressors (MLIS)

Especially designed or prepared compressors for UF_6/carrier gas mixtures, designed for long term operation in a UF_6 environment. The components of these compressors that come into contact with process gas are made of or protected by materials resistant to corrosion by UF_6.

5.7.8. Rotary shaft seals (MLIS)

Especially designed or prepared rotary shaft seals, with seal feed and seal exhaust connections, for sealing the shaft connecting the compressor rotor with the driver motor so as to ensure a reliable seal against out-leakage of process gas or in-leakage of air or seal gas into the inner chamber of the compressor which is filled with a UF_6/carrier gas mixture.

5.7.9. Fluorination systems (MLIS)

Especially designed or prepared systems for fluorinating UF_5 (solid) to UF_6 (gas).

EXPLANATORY NOTE

These systems are designed to fluorinate the collected UF_5 powder to UF_6 for subsequent collection in product containers or for transfer as feed to MLIS units for additional enrichment. In one approach, the fluorination reaction may be accomplished within the isotope separation system to react and recover directly off the 'product' collectors. In another approach, the UF_5 powder may be removed/transferred from the 'product' collectors into a suitable reaction vessel (e.g., fluidized-bed reactor, screw reactor or flame tower) for fluorination. In both approaches, equipment for storage and transfer of fluorine (or other suitable fluorinating agents) and for collection and transfer of UF_6 are used.

5.7.10. UF_6 mass spectrometers/ion sources (MLIS)

Especially designed or prepared magnetic or quadrupole mass spectrometers capable of taking 'on-line' samples of feed, 'product' or 'tails', from UF_6 gas streams and having all of the following characteristics:

1. Unit resolution for mass greater than 320;

2. Ion sources constructed of or lined with nichrome or monel or nickel plated;

3. Electron bombardment ionization sources;

4. Collector system suitable for isotopic analysis.

5.7.11. Feed systems/product and tails withdrawal systems (MLIS)

Especially designed or prepared process systems or equipment for enrichment plants made of or protected by materials resistant to corrosion by UF_6, including:

(a) Feed autoclaves, ovens, or systems used for passing UF_6 to the enrichment process

(b) Desublimers (or cold traps) used to remove UF_6 from the enrichment process for subsequent transfer upon heating;

(c) Solidification or liquefaction stations used to remove UF_6 from the enrichment process by compressing and converting UF_6 to a liquid or solid form;

(d) 'Product' or 'tails' stations used for transferring UF_6 into containers.

5.7.12. UF_6/carrier gas separation systems (MLIS)

Especially designed or prepared process systems for separating UF_6 from carrier gas. The carrier gas may be nitrogen, argon, or other gas.

EXPLANATORY NOTE

These systems may incorporate equipment such as:

(a) Cryogenic heat exchangers or cryoseparators capable of temperatures of -120 °C or less, or

(b) Cryogenic refrigeration units capable of temperatures of -120 °C or less, or

(c) UF_6 cold traps capable of temperatures of -20 °C or less.

5.7.13. Laser systems (AVLIS, MLIS and CRISLA)

Lasers or laser systems especially designed or prepared for the separation of uranium isotopes.

EXPLANATORY NOTE

The laser system for the AVLIS process usually consists of two lasers: a copper vapor laser and a dye laser. The laser system for MLIS usually consists of a CO_2 or excimer laser and a multi-pass optical cell with revolving mirrors at both ends. Lasers or laser systems for both processes require a spectrum frequency stabilizer for operation over extended periods of time.

5.8. Especially designed or prepared systems, equipment and components for use in plasma separation enrichment plants

INTRODUCTORY NOTE

In the plasma separation process, a plasma of uranium ions passes through an electric field tuned to the U-235 ion resonance frequency so that they preferentially absorb energy and increase the diameter of their corkscrew-like orbits. Ions with a large-diameter path are trapped to produce a product enriched in U-235. The plasma, which is made by ionizing uranium vapor, is contained in a vacuum chamber with a high-strength magnetic field produced by a superconducting magnet. The main technological systems of the process include the uranium plasma generation system, the separator module with superconducting magnet and metal removal systems for the collection of 'product' and 'tails'.

5.8.1. Microwave power sources and antennae

Especially designed or prepared microwave power sources and antennae for producing or accelerating ions and having the following characteristics: greater than 30 GHz frequency and greater than 50 kW mean power output for ion production.

5.8.2. Ion excitation coils

Especially designed or prepared radio frequency ion excitation coils for frequencies of more than 100 kHz and capable of handling more than 40 kW mean power.

5.8.3. Uranium plasma generation systems

Especially designed or prepared systems for the generation of uranium plasma, which may contain high-power strip or scanning electron beam guns with a delivered power on the target of more than 2.5 kW/cm.

5.8.4. Liquid uranium metal handling systems

Especially designed or prepared liquid metal handling systems for molten uranium or uranium alloys, consisting of crucibles and cooling equipment for the crucibles.

EXPLANATORY NOTE

The crucibles and other parts of this system that come into contact with molten uranium or uranium alloys are made of or protected by materials of suitable corrosion and heat resistance. Suitable materials include tantalum, yttria-coated graphite, graphite coated with other rare earth oxides or mixtures thereof.

5.8.5. Uranium metal 'product' and 'tails' collector assemblies

Especially designed or prepared 'product' and 'tails' collector assemblies for uranium metal in solid form. These collector assemblies are made of or protected by materials resistant to the heat and corrosion of uranium metal vapor, such as yttria-coated graphite or tantalum.

5.8.6. Separator module housings

Cylindrical vessels especially designed or prepared for use in plasma separation enrichment plants for containing the uranium plasma source, radio-frequency drive coil and the 'product' and 'tails' collectors.

EXPLANATORY NOTE

These housings have a multiplicity of ports for electrical feed-throughs, diffusion pump connections and instrumentation diagnostics and monitoring. They have provisions for opening and closure to allow for refurbishment of internal components and are constructed of a suitable non-magnetic material such as stainless steel.

5.9. Especially designed or prepared systems, equipment and components for use in electromagnetic enrichment plants

INTRODUCTORY NOTE

In the electromagnetic process, uranium metal ions produced by ionization of a salt feed material (typically UCl_4) are accelerated and passed through a magnetic field that has the effect of causing the ions of different isotopes to follow different paths. The major components of an electromagnetic isotope separator include: a magnetic field for ion-beam diversion/separation of the isotopes, an ion source with its acceleration system, and a collection system for the separated ions. Auxiliary systems for the process include the magnet power supply system, the ion source high-voltage power supply system, the vacuum system, and extensive chemical handling systems for recovery of product and cleaning/recycling of components.

5.9.1. Electromagnetic isotope separators

Electromagnetic isotope separators especially designed or prepared for the separation of uranium isotopes, and equipment and components therefor, including:

(a) Ion sources

Especially designed or prepared single or multiple uranium ion sources consisting of a vapor source, ionizer, and beam accelerator, constructed of suitable materials such as graphite, stainless steel, or copper, and capable of providing a total ion beam current of 50 mA or greater.

(b) Ion collectors

Collector plates consisting of two or more slits and pockets especially designed or prepared for collection of enriched and depleted uranium ion beams and constructed of suitable materials such as graphite or stainless steel.

(c) Vacuum housings

Especially designed or prepared vacuum housings for uranium electromagnetic separators, constructed of suitable non-magnetic materials such as stainless steel and designed for operation at pressures of 0.1 Pa or lower.

EXPLANATORY NOTE

The housings are specially designed to contain the ion sources, collector plates and water-cooled liners and have provision for diffusion pump connections and opening and closure for removal and reinstallation of these components.

(d) Magnet pole pieces

Especially designed or prepared magnet pole pieces having a diameter greater than 2 m used to maintain a constant magnetic field within an electromagnetic isotope separator and to transfer the magnetic field between adjoining separators.

5.9.2. High voltage power supplies

Especially designed or prepared high-voltage power supplies for ion sources, having all of the following characteristics: capable of continuous operation, output voltage of 20,000 V or greater, output current of 1 A or greater, and voltage regulation of better than 0.01% over a time period of 8 hours.

5.9.3. Magnet power supplies

Especially designed or prepared high-power, direct current magnet power supplies having all of the following characteristics: capable of continuously producing a current output of 500 A or greater at a voltage of 100 V or greater and with a current or voltage regulation better than 0.01% over a period of 8 hours.

6. Plants for the production of heavy water, deuterium and deuterium compounds and equipment especially designed or prepared therefor

INTRODUCTORY NOTE

Heavy water can be produced by a variety of processes. However, the two processes that have proven to be commercially viable are the water-hydrogen sulphide exchange process (GS process) and the ammonia-hydrogen exchange process.

The GS process is based upon the exchange of hydrogen and deuterium between water and hydrogen sulphide within a series of towers which are operated with the top section cold and the bottom section hot. Water flows down the towers while the hydrogen sulphide gas circulates from the bottom to the top of the towers. A series of perforated trays are used to promote mixing between the gas and the water. Deuterium migrates to the water at low temperatures and to the hydrogen sulphide at high temperatures. Gas or water, enriched in deuterium, is removed from the first stage towers at the junction of the hot and cold sections and the process is repeated in subsequent stage towers. The product of the last stage, water enriched up to 30% in deuterium, is sent to a distillation unit to produce reactor grade heavy water, i.e., 99.75% deuterium oxide.

The ammonia-hydrogen exchange process can extract deuterium from synthesis gas through contact with liquid ammonia in the presence of a catalyst. The synthesis gas is fed into exchange towers and to an ammonia converter. Inside the towers the gas flows from the bottom to the top while the liquid ammonia flows from the top to the bottom. The deuterium is stripped from the hydrogen in the synthesis gas and concentrated in the ammonia. The ammonia then flows into an ammonia cracker at the bottom of the tower while the gas flows into an ammonia converter at the top. Further enrichment takes place in subsequent stages and reactor grade heavy water is produced through final distillation. The synthesis gas feed can be provided by an ammonia plant that, in turn, can be constructed in association with a heavy water ammonia-hydrogen exchange plant. The ammonia-hydrogen exchange process can also use ordinary water as a feed source of deuterium.

Many of the key equipment items for heavy water production plants using GS or the ammonia-hydrogen exchange processes are common to several segments of the chemical and petroleum industries. This is particularly so for small plants using the GS process. However, few of the items are available "off-the-shelf". The GS and ammonia-hydrogen processes require the handling of large quantities of flammable,

corrosive and toxic fluids at elevated pressures. Accordingly, in establishing the design and operating standards for plants and equipment using these processes, careful attention to the materials selection and specifications is required to ensure long service life with high safety and reliability factors. The choice of scale is primarily a function of economics and need. Thus, most of the equipment items would be prepared according to the requirements of the customer.

Finally, it should be noted that, in both the GS and the ammonia-hydrogen exchange processes, items of equipment which individually are not especially designed or prepared for heavy water production can be assembled into systems which are especially designed or prepared for producing heavy water. The catalyst production system used in the ammonia-hydrogen exchange process and water distillation systems used for the final concentration of heavy water to reactor-grade in either process are examples of such systems.

The items of equipment which are especially designed or prepared for the production of heavy water utilizing either the water-hydrogen sulphide exchange process or the ammonia-hydrogen exchange process include the following:

6.1. Water - Hydrogen Sulphide Exchange Towers

Exchange towers fabricated from fine carbon steel (such as ASTM A516) with diameters of 6 m (20 ft) to 9 m (30 ft), capable of operating at pressures greater than or equal to 2 MPa (300 psi) and with a corrosion allowance of 6 mm or greater, especially designed or prepared for heavy water production utilizing the water-hydrogen sulphide exchange process.

6.2. Blowers and Compressors

Single stage, low head (i.e., 0.2 MPa or 30 psi) centrifugal blowers or compressors for hydrogen-sulphide gas circulation (i.e., gas containing more than 70% H_2S) especially designed or prepared for heavy water production utilizing the water-hydrogen sulphide exchange process. These blowers or compressors have a throughput capacity greater than or equal to 56 m^3/second (120,000 SCFM) while operating at pressures greater than or equal to 1.8 MPa (260 psi) suction and have seals designed for wet H_2S service.

6.3. Ammonia-Hydrogen Exchange Towers

Ammonia-hydrogen exchange towers greater than or equal to 35 m (114.3 ft) in height with diameters of 1.5 m (4.9 ft) to 2.5 m (8.2 ft) capable of operating at pressures greater than 15 MPa (2225 psi) especially designed or prepared for heavy water production utilizing the ammonia-hydrogen exchange process. These towers also have at least one flanged axial opening of the same diameter as the cylindrical part through which the tower internals can be inserted or withdrawn.

6.4. Tower Internals and Stage Pumps

Tower internals and stage pumps especially designed or prepared for towers for heavy water production utilizing the ammonia-hydrogen exchange process. Tower internals include especially designed stage contactors which promote intimate gas/liquid contact. Stage pumps include especially designed submersible pumps for circulation of liquid ammonia within a contacting stage internal to the stage towers.

6.5. Ammonia Crackers

Ammonia crackers with operating pressures greater than or equal to 3 MPa (450 psi) especially designed or prepared for heavy water production utilizing the ammonia-hydrogen exchange process.

6.6. Infrared Absorption Analyzers

Infrared absorption analyzers capable of "on-line" hydrogen/deuterium ratio analysis where deuterium concentrations are equal to or greater than 90%.

6.7. Catalytic Burners

Catalytic burners for the conversion of enriched deuterium gas into heavy water especially designed or prepared for heavy water production utilizing the ammonia-hydrogen exchange process.

7. Plants for the conversion of uranium and equipment especially designed or prepared therefor

INTRODUCTORY NOTE

Uranium conversion plants and systems may perform one or more transformations from one uranium chemical species to another, including: conversion of uranium ore concentrates to UO_3, conversion of UO_3 to UO_2, conversion of uranium oxides to UF_4 or UF_6, conversion of UF_4 to UF_6, conversion of UF_6 to UF_4, conversion of UF_4 to uranium metal, and conversion of uranium fluorides to UO_2. Many of the key equipment items for uranium conversion plants are common to several segments of the chemical process industry. For example, the types of equipment employed in these processes may include: furnaces, rotary kilns, fluidized bed reactors, flame tower reactors, liquid centrifuges, distillation columns and liquid-liquid extraction columns. However, few of the items are available "off-the-shelf"; most would be prepared according to the requirements and specifications of the customer. In some instances, special design and construction considerations are required to address the corrosive properties of some of the chemicals handled (HF, F_2, ClF_3, and uranium fluorides). Finally, it should be noted that, in all of the uranium conversion processes, items of equipment which individually are not especially designed or

prepared for uranium conversion can be assembled into systems which are especially designed or prepared for use in uranium conversion.

7.1. Especially designed or prepared systems for the conversion of uranium ore concentrates to UO_3

EXPLANATORY NOTE

Conversion of uranium ore concentrates to UO_3 can be performed by first dissolving the ore in nitric acid and extracting purified uranyl nitrate using a solvent such as tributyl phosphate. Next, the uranyl nitrate is converted to UO_3 either by concentration and denitration or by neutralization with gaseous ammonia to produce ammonium diuranate with subsequent filtering, drying, and calcining.

7.2. Especially designed or prepared systems for the conversion of UO_3 to UF_6

EXPLANATORY NOTE

Conversion of UO_3 to UF_6 can be performed directly by fluorination. The process requires a source of fluorine gas or chlorine trifluoride.

7.3. Especially designed or prepared systems for the conversion of UO_3 to UO_2

EXPLANATORY NOTE

Conversion of UO_3 to UO_2 can be performed through reduction of UO_3 with cracked ammonia gas or hydrogen.

7.4. Especially designed or prepared systems for the conversion of UO_2 to UF_4

EXPLANATORY NOTE

Conversion of UO_2 to UF_4 can be performed by reacting UO_2 with hydrogen fluoride gas (HF) at 300-500 °C.

7.5. Especially designed or prepared systems for the conversion of UF_4 to UF_6

EXPLANATORY NOTE

Conversion of UF_4 to UF_6 is performed by exothermic reaction with fluorine in a tower reactor. UF_6 is condensed from the hot effluent gases by passing the effluent stream through a cold trap cooled to -10 °C. The process requires a source of fluorine gas.

7.6. Especially designed or prepared systems for the conversion of UF_4 to U metal

EXPLANATORY NOTE

Conversion of UF_4 to U metal is performed by reduction with magnesium (large batches) or calcium (small batches). The reaction is carried out at temperatures above the melting point of uranium (1130 °C).

7.7. Especially designed or prepared systems for the conversion of UF_6 to UO_2

EXPLANATORY NOTE

Conversion of UF_6 to UO_2 can be performed by one of three processes. In the first, UF_6 is reduced and hydrolyzed to UO_2 using hydrogen and steam. In the second, UF_6 is hydrolyzed by solution in water, ammonia is added to precipitate ammonium diuranate, and the diuranate is reduced to UO_2 with hydrogen at 820 °C. In the third process, gaseous UF_6, CO_2, and NH_3 are combined in water, precipitating ammonium uranyl carbonate. The ammonium uranyl carbonate is combined with steam and hydrogen at 500-600 °C to yield UO_2.

UF_6 to UO_2 conversion is often performed as the first stage of a fuel fabrication plant.

7.8. Especially designed or prepared systems for the conversion of UF_6 to UF_4

EXPLANATORY NOTE

Conversion of UF_6 to UF_4 is performed by reduction with hydrogen.

ATTACHMENT 2

Committee on Strengthening the Effectiveness and Improving the Efficiency of the Safeguards System

INTERPRETATION BY THE SECRETARIAT OF THE RELATIONSHIP BETWEEN THE PROTOCOL AND THE SAFEGUARDS AGREEMENT

(Excerpt from the summary record
of the Committee's 48th meeting, held on 31 January 1997)

Mr. ELBARADEI (Assistant Director General, Division of External Relations) said that in his view it was of fundamental importance that everyone understand the ideas behind Article 1. For legal purposes, that was crucial to the interpretation and implementation of the Protocol and the Safeguards Agreement. He would like to go through his interpretation of the relationship between the Protocol and the Safeguards Agreement. It was important that everyone see eye to eye on that relationship and how it operated. The question of its formulation was a different matter, but he believed that the Committee would share his interpretation.

Article 1, which dealt with the relationship between the Protocol and the Safeguards Agreement, did not seek to determine the question of the existence or non-existence of a legal obligation to adhere to the Protocol. Nor did it prejudge the question of prospective parties or the modalities for their adherence; whether States would adhere individually, or as a group, or in conjunction with international organizations was outside the scope of Article 1. Questions of legal obligations and political undertakings had to be considered in the light of States' non-proliferation obligations and policies outside the framework of the Protocol. Article 1 simply sought to determine the manner in which the Protocol was to be implemented in conjunction with the Safeguards Agreement.

Another point regarding the relationship was that, as had been agreed from the outset, the Protocol was not to be a stand-alone document - for two reasons. Firstly, no State could adhere to the Protocol unless it had previously concluded a Safeguards Agreement with the Agency. Secondly, the Protocol depended in many ways on the underlying Safeguards Agreement. The Committee had decided at the outset not to go through a process of amending the Safeguards Agreement or creating a new, stand-alone document; it had decided to create a document which had a "symbiotic" relationship with the Safeguards Agreement, so that they co-existed in a dynamic relationship working in each direction. The Protocol did not have many clauses which should exist if it were a stand-alone document; for example, it did not have any settlement of disputes, interpretation or amendment clauses. In those instances, reliance was placed in the existence of such clauses in the Safeguards Agreement. In other respects, the Protocol superseded the provisions of the Safeguards Agreement - for example, on the questions of inspector designation and visas. The relationship between the two documents was best described as "dynamic" and "symbiotic". The Protocol depended on the Safeguards Agreement, and in certain respects the Safeguards Agreement depended on the Protocol.

That interrelationship led to one inevitable conclusion: for the purpose of interpretation, the two agreements - once concluded - had to be read and interpreted as one agreement. That was the only way in which the two documents could be implemented together.

That was his interpretation of the relationship. He hoped that all Committee members shared it as it was fundamental to the future implementation of the Protocol and the Safeguards Agreement. If that interpretation was acceptable, it would be possible to look into how Article 1 - and particularly the first sentence - should be formulated.

The fact that the Protocol was additional to the Safeguards Agreement was in his view already reflected in the Protocol's title, so that the issue covered by the first part of the first sentence had already been resolved. It was the second part of the first sentence which was giving rise to discussion in the Committee. No matter how it was formulated, however, he would like his interpretation - which would be in the summary record of the meeting - to be accepted by all Committee members and to serve as guidance in the future for implementing the Protocol and the Safeguards Agreement.

3 April 1997

ATTACHMENT 3

Committee on Strengthening the Effectiveness and Improving the Efficiency of the Safeguards System

Understanding Recorded by the Committee Concerning the Interpretation of Article 1 as far as the Manner of Concluding Additional Protocols and the Responsibility for their Implementation

1. In adopting Article 1, the Committee took note of the Interpretation provided by the Secretariat at the meeting of the Committee on 31 January 1997.

2. For States that are members of international institutions that are party to safeguards agreements with the IAEA, this text does not prejudge the legal modalities which these States and international institutions adopt regarding the conclusion of additional protocols or the division of responsibilities in their implementation.

International Atomic Energy Agency
BOARD OF GOVERNORS

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RECORD OF THE NINE HUNDRED AND THIRTEENTH MEETING

Held at Headquarters, Vienna,
on Thursday, 15 May 1997, at 10.45 a.m.

CONTENTS

[*] The 910th, 911th and 912th meetings of the Board, held on 19, 21 and 24 March 1997 respectively, were closed meetings for which no summary records were issued. A verbatim transcript of the discussion is available for consultation.

[**] GOV/2912.

97-01897 (XXVIII)

Attendance

(The list below gives the name of the senior member of each delegation who attended the meeting, as well as that of any other member whose statement is summarized in this record.)

Mr. P. WALKER	Chairman (Canada)

Mr. PESCI BOUREL	Argentina
Mr. JOSEPH	Australia
Mr. ADAM	Belgium
Mr. de OURO-PRETO	Brazil
Mr. I. PETROV	Bulgaria
Mr. MACKINNON	Canada
Mr. SILVA HENNINGS	Chile
Mr. LI Changhe	China
Mr. AGUIRRE AGUIRRE	Colombia
Mr. SABURIDO	Cuba
Mr. STULLER	Czech Republic
Mr. BOEL ABRAHAMSEN	Denmark
Mr. EL-FEKI	Egypt
Mr. PRETTRE	France
Mr. BORCHARD	Germany
Mr. TIWARI	India
Mr. IKEDA	Japan
Mr. Seung-Kon LEE	Korea, Republic of
Mr. AL-GHAIS	Kuwait
Ms. LEONG	Malaysia
Mr. LISWANISO	Namibia
Mr. FÖRSTER	Netherlands
Mr. COOK	New Zealand
Mr. AGEV	Nigeria
Mr. ALCANTARA de MELO	Portugal
Mr. PUTINEANU	Romania
Mr. SOKOLOV	Russian Federation
Mr. AL-TAIFI	Saudi Arabia
Ms. MXAKATO-DISEKO	South Africa
Mr. MAYOR	Switzerland
Mr. EL FADHEL KHALIL Mr. BOUZOUITA	Tunisia

Attendance
(Contd.)

Mr. ABDULLA MAHMOUD	United Arab Emirates
Mr. HEATHCOTE	United Kingdom of Great Britain and Northern Ireland
Mr. RITCH	United States of America

Mr. BLIX	Director General
Mr. PELLAUD	Deputy Director General, Department of Safeguards
Mr. SANMUGANATHAN	Secretary of the Board

Representatives of the following Member States attended the meeting:

Algeria, Armenia, Austria, Croatia, Finland, Greece, Holy See, Hungary, Indonesia, Islamic Republic of Iran, Ireland, Israel, Italy, Jordan, Lebanon, Lithuania, Luxembourg, Mexico, Morocco, Pakistan, Paraguay, Peru, Philippines, Poland, Slovakia, Slovenia, Spain, Sweden, Syrian Arab Republic, Thailand, Turkey, Ukraine, Viet Nam.

Abbreviations used in this record

ABACC	Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials
Chemical Weapons Convention	Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction
NPT	Treaty on the Non-Proliferation of Nuclear Weapons
NPT Review and Extension Conference	Review and Extension Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons
OPANAL	Agency for the Prohibition of Nuclear Weapons in Latin America and the Caribbean
R&D	Research and development
SIR	Safeguards Implementation Report
Tlatelolco Treaty	Treaty for the Prohibition of Nuclear Weapons in Latin America and the Caribbean
UNSCOM	United Nations Special Commission for the Elimination of Iraq's Weapons of Mass Destruction

OPENING STATEMENT BY THE CHAIRMAN

1. The CHAIRMAN recalled the decision taken by the Board eleven months previously to establish a committee with the task of drafting a model protocol additional to safeguards agreements. It was a pleasure for him to report that the Committee on Strengthening the Effectiveness and Improving the Efficiency of the Safeguards System (Committee 24) had completed its work. Governors were aware of the significance of the task which the Board had entrusted to Committee 24 and thus of the importance of the fact that Committee 24 had completed its work.

2. The Committee's report was before the Board in document GOV/2914, and the Model Protocol was contained in Attachment 1 to that document.

3. Expressing appreciation of the substantial contribution made by Member States to the work of Committee 24, he said that they had taken their responsibilities very seriously. The quality of the discussions had consistently been of a high order. In his opinion, the outcome - namely, the Model Protocol - illustrated that fact.

4. Committee 24 having completed its work, it was now up to the Board to decide whether it wished to endorse the results and thereby make a substantial contribution to the international non-proliferation regime. He was confident that it would do so.

ADOPTION OF THE AGENDA (GOV/2912)

5. The CHAIRMAN said he assumed that the Board wished to adopt the provisional agenda set out in document GOV/2912.

6. It was so decided.

DEVELOPMENTS RELATING TO THE STATEMENT MADE ON 20 JANUARY 1997 BY THE CHAIRMAN OF THE COMMITTEE ON STRENGTHENING THE EFFECTIVENESS AND IMPROVING THE EFFICIENCY OF THE SAFEGUARDS SYSTEM WITH REGARD TO THE SCOPE OF APPLICATION OF THE DRAFT MODEL PROTOCOL

7. The CHAIRMAN said that, as all Governors were aware, there was a relationship between the measures which would be accepted by States with comprehensive

safeguards agreements and the measures which other States, particularly the nuclear-weapon States, were prepared to adopt. As Chairman of Committee 24, he had made that point during the first meeting of the Committee's January 1997 session; he had indicated that it was his understanding that the nuclear-weapon States had been considering what measures they would be prepared to adopt and the procedures for ensuring that commitments on the part of the nuclear-weapon States and non-nuclear-weapon States proceeded with a certain degree of parallelism. He had gone on to indicate that that meant that, at the meeting at which it was called upon to approve the report of Committee 24 (including the Protocol), the Board would take a decision on the Protocol in the light of an understanding of the positions of the nuclear-weapon States. That point was reflected in paragraphs 5 and 6 of Committee 24's report.

8. The meeting to which he had then referred was now taking place, and both the substance and the sequence of items 3 and 4 of the agenda were very important.

9. Mr. LI Changhe (China) said that the prevention of nuclear weapons proliferation was a matter of common concern to the entire international community. As a State party to the NPT, China had earnestly and responsibly fulfilled its international obligations regarding nuclear non-proliferation, consistently calling for the prohibition and destruction of all nuclear weapons. It did not advocate, encourage or engage in nuclear weapons proliferation, nor would it ever help any other country to develop nuclear weapons. In addition, China did not provide assistance to unsafeguarded nuclear facilities.

10. China exercised strict control over its nuclear exports, insisting that the exported items be used exclusively for peaceful purposes, be placed under Agency safeguards and not be transferred to a third party without China's consent. Moreover, China supported the Agency's safeguards and all efforts to increase the effectiveness and efficiency of the safeguards system.

11. China had consistently supported Programme 93+2, participating actively, constructively and flexibly in and contributing to the work of Committee 24.

12. Despite the fact that the objective of Programme 93+2 was to enhance the Agency's capacity for detecting undeclared nuclear activities in non-nuclear-weapon States with comprehensive safeguards agreements, China was prepared, on a voluntary basis, to make a contribution, together with the other four nuclear-weapon States, to the attainment of that objective. However, as the history and conditions of nuclear development in the five nuclear-weapon States differed, those States could not be expected to make the same contributions.

13. As envisaged in the third paragraph of the Foreword to the Model Protocol, China was prepared to enter into negotiations with the Agency in due course, and in the light of the obligations set forth in Article I of the NPT, with a view to adopting, in a legally binding instrument, certain measures as set forth below:

"1. China will provide the Agency with the following:

(a) A description of the scale of operations for each location engaged in the activities specified in Annex I to the Model Protocol that involve links with nuclear fuel cycle operations conducted in, and in co-operation with, non-nuclear-weapon States (Article 2.a.(iv));

(b) Information on the location and the annual production for non-nuclear-weapon States of uranium mines and concentration plants and thorium concentration plants (Article 2.a.(v));

(c) Information on imports from and exports to non-nuclear-weapon States of source materials, including ores and concentrates of uranium and thorium (Article 2.a.(vi));

(d) Information on imports from and exports to non-nuclear-weapon States of nuclear materials exempted from safeguards (Article 2.a.(vii));

(e) Information on imports from and exports to non-nuclear-weapon States of intermediate- or high-level waste containing plutonium, high-enriched uranium or uranium-233 on which safeguards have been terminated (Article 2.a.(viii));

(f) Information on exports to non-nuclear-weapon States of items specified in Annex II to the Model Protocol (Article 2.a.(ix));

(g) General government-to-government plans drawn up with non-nuclear-weapon States relevant to nuclear fuel cycle developments during the succeeding ten-year period (Article 2.a.(x)).

"2. China will, upon request by the Agency, provide general information on nuclear fuel cycle-related research and development activities which are carried out in co-operation with non-nuclear-weapon States (Article 2.a.(i) and Article 2.b).

"3. China will, upon request by the Agency, provide amplifications or clarifications of any information provided pursuant to paragraphs 1 and 2 above, insofar as they are relevant for the purpose of safeguards (Article 2.c).

"4. To facilitate verification of the relevant information submitted by non-nuclear-weapon States, China may provide necessary clarifications to the Agency for the purpose of safeguards.

"5. China will accept in principle the measures relating to the designation of Agency inspectors (Article 11), visas (Article 12) and communications systems (Article 14) provided for in the Model Protocol.

"6. China agrees in principle to the provisions concerning Subsidiary Arrangements (Article 13), the protection of confidential information (Article 15), the Annexes (Article 16), the entry into force of the Protocol (Article 17) and definitions (Article 18)."

14. Mr. SOKOLOV (Russian Federation) said his country considered Agency safeguards activities to be a key element in the system for maintaining and strengthening the international nuclear non-proliferation regime and international security. The Russian Federation had been pursuing a consistent line as regards maintaining and increasing the effectiveness of the Agency's safeguards system. The work under way within the Agency framework since the beginning of the 1990s on enhancing safeguards with a view to developing a greater capacity for the detection of undeclared nuclear activities had received a major boost through the decisions taken at the 1995 NPT Review and Extension Conference. In his address at the April 1996 Moscow Nuclear Safety and Security Summit, President Yeltsin had stated that in his view it was necessary to support the Agency in its efforts to create and introduce an effective system for detecting possible clandestine nuclear activities.

15. In that connection, Russia was acting on the basis of its belief that the Agency's practical safeguards implementation activities must not hamper States' scientific and technical development or international co-operation among States in the field of the peaceful use of atomic energy and must be founded on optimum utilization of the Agency's human and material resources.

16. The draft Model Protocol before the Board was not only the fruit of intensive and meticulous work on the part of the Secretariat and Member States, but also a document which struck a delicate balance between, on the one hand, safeguards-strengthening measures and, on the other, the technical, legal and administrative limits on their implementation which were faced by Member State governments. In his delegation's view, such a reasonable compromise had been arrived at only because participating countries had appreciated the vital need to increase - in the light of the present situation - the effectiveness and efficiency of the safeguards system.

17. Implementation of the envisaged Programme 93+2 measures would increase the Agency's capacity for uncovering possible cases of diversion of nuclear material from peaceful applications to the manufacture of nuclear weapons and thereby create greater assurance regarding the absence of undeclared nuclear activities. Ultimately, the reduced threat of nuclear proliferation would be an obvious gain for all.

18. The Foreword to the draft Protocol pointed to the possibility of the negotiation with nuclear-weapon States of additional protocols or other legally binding agreements incorporating those measures provided for in the Model Protocol which each nuclear-weapon State had identified as being capable of contributing to the non-proliferation aims of the Protocol and as being consistent with that State's obligations under Article I of the NPT.

19. After approval of the draft Model Protocol, the Russian Federation would be ready to apply a number of the measures provided for in it with a view to increasing safeguards effectiveness and efficiency. In particular, it would be ready to provide additional

information on its nuclear exports to non-nuclear-weapon States and on Russian nuclear material located within the territory of other States.

20. Moreover, the Russian Federation could provide to the Agency information on international co-operation with non-nuclear-weapon States in the nuclear fuel cycle field that was of importance from the nuclear non-proliferation point of view

21. The Russian Federation would also be ready to create suitable conditions for the possible testing of new technical safeguards measures and to conduct experiments within its territory with a view to the subsequent application of such measures in non-nuclear-weapon States, the aim being to reduce the Agency's expenditures on their implementation.

22. Lastly, the Russian Federation would be ready to take steps aimed at further streamlining and simplifying the procedures for designating Agency inspectors and issuing visas.

23. Russia was co-operating closely with the Agency in the safeguards area and supporting the Agency's safeguards activities, making highly qualified specialists and experts available for participation in inspections, in advisory groups developing approaches to the evaluation of safeguards effectiveness and in work on seeking optimum ways of improving the technical resources of safeguards.

24. With the completion of Programme 93+2, the Agency's inspection activities would - it was to be hoped - become more effective and efficient. The Russian Federation intended to continue supporting the Agency fully in its efforts to improve the safeguards system and strengthen the international non-proliferation regime.

25. Mr. PRETTRE (France) said that his country had actively supported Programme 93+2 from the start.

26. His delegation was pleased with the consensus at which Committee 24 had arrived on the draft Model Protocol now before the Board for approval. The Agency was to be invested with powers which would enable it to acquire a better knowledge of States' nuclear activities - an essential condition for averting the risks of nuclear proliferation.

27. For its part, France had announced already in 1996 that it would, as a nuclear-weapon State, assume responsibilities in connection with the implementation of Programme 93+2 and the attainment of its non-proliferation aims. He would now indicate the commitments which France was ready to undertake on the basis of the Model Protocol and in accordance with the conditions set forth in the third paragraph of the Foreword thereto.

28. France would undertake to apply - under one or more legally binding agreements negotiated with the Agency - those measures provided for in the Model Protocol which were relevant from the point of view of improving safeguards efficiency and strengthening non-proliferation controls. The measures would have to be consistent with the obligations arising out of Article I of the NPT.

29. With regard to the efficiency of the safeguards applied in France, his authorities had identified the relevant measures provided for in the Model Protocol, taking into account the special features of France's existing safeguards agreement with the Agency (INFCIRC/290); the measures related essentially to the provision of additional information as provided for in Article 2.a.(ii) and hence to the granting to the Agency of complementary access for possible verification activities.

30. France's commitments would also concern those measures provided for in the Protocol which, when implemented in France, could help to reduce the risks of proliferation in non-nuclear-weapon States. In that regard, he felt it might be useful to recall that the principal operational aim of Programme 93+2 was to improve the chances of detecting possible clandestine nuclear activities inconsistent with the peaceful uses declared by States.

31. As a nuclear-weapon State, France could - by definition - not be suspected of engaging in such clandestine activities. It could nevertheless contribute usefully to the implementation of Programme 93+2 by ensuring complete transparency in the nuclear activities which it was pursuing in relation to non-nuclear-weapon States. Given the scale

of those activities, particularly those relating to the nuclear fuel cycle, France's involvement was likely to be substantial.

32. Accordingly, France would provide the Agency with information as specified in the Model Protocol on those of its nuclear activities which related to non-nuclear-weapon States and would grant the complementary access in question as provided for in the Protocol.

33. He did not consider it necessary to spell out the provisions of the Model Protocol which France was ready to apply by virtue of their relevance as he had just indicated. The details were given in the position paper which his delegation had made available. He wished simply to emphasize that the vast majority of the measures provided for in the Model Protocol would be susceptible of application by France, provided that non-nuclear-weapon States were involved in the activities concerned, which would often be the case. In particular, his country intended to implement fully the Protocol provision whereby amplifications and clarifications would be provided to the Agency, if it so requested, in order to supplement the information contained in its declaration.

34. The measures susceptible of application by France would be the subject of legally binding commitments negotiated with the Agency. Naturally, France would make any legal or regulatory arrangements required under its domestic laws in order to ensure compliance with its international commitments.

35. Mr. HEATHCOTE (United Kingdom), having congratulated the Chairman on the outcome of the work done over the past year, said that the draft Model Protocol before the Board seemed to respond well to the mandate given by the Board to Committee 24. It contained a series of measures which, when implemented by all States concerned, would - in his delegation's view - represent a substantial strengthening of the Agency's safeguards system. At the same time, it sought to take full account of real and understandable concerns about intrusiveness and the need to protect commercially sensitive information. In short, it was well balanced.

36. Although the draft Model Protocol had been prepared as the standard for additional protocols to be concluded with the Agency by States and other parties to comprehensive safeguards agreements, the third paragraph of the Foreword contained a provision concerning nuclear-weapon States. In the light of that provision, the United Kingdom authorities had been identifying those measures provided for in the Model Protocol which, when implemented with regard to the United Kingdom, would contribute to the non-proliferation or efficiency aims of the Protocol and which were consistent with the United Kingdom's obligations under Article I of the NPT.

37. The approach of the United Kingdom authorities to the question of the implementation of Protocol measures in the United Kingdom was based on the belief that the United Kingdom should be ready to accept those measures which, when implemented by it, would either

(a) contribute to an increase in the Agency's ability to detect undeclared nuclear activities in non-nuclear-weapon States or

(b) improve the effectiveness or efficiency of Agency safeguards at facilities in the United Kingdom designated for Agency inspection.

Moreover, where information was provided on activities being carried out at a particular location, Agency inspectors would be granted access to that location under the conditions which would apply in the case of non-nuclear-weapon States pursuant to the Model Protocol. The provision of such access was important in order that the Agency might confirm that information which it had received was correct.

38. The details of the United Kingdom's intentions were set out in a document which had been made available to all members of the Board. The document specified, measure by measure, the commitments which the United Kingdom was prepared to enter into through a new legally binding agreement - or new legally binding agreements - with the Agency.

39. Giving examples of the measures which the United Kingdom was ready to implement in support of the non-proliferation aims of the Model Protocol, he said that

- pursuant to Article 2.a.(i) of the Model Protocol, the United Kingdom would provide to the Agency information on nuclear fuel cycle-related R&D activities carried out for, or in co-operation with, customers in non-nuclear weapon States;
- similarly, pursuant to Article 2.a.(iv), it would provide information on specified nuclear-related activities in the United Kingdom when (as in the case of the assembly of gas centrifuges from components received from one of the United Kingdom's Urenco partners) they involved a link with fuel cycle operations in a non-nuclear-weapon State; and
- pursuant to Article 2.a.(ix), it would provide information on exports to non-nuclear-weapon States of specified nuclear equipment and non-nuclear material, and on imports of such equipment and material upon request by the Agency.

40. In support of the effectiveness and efficiency aims of the Protocol, the United Kingdom was also ready to provide information on operational activities of safeguards relevance at all facilities in the United Kingdom already designated or yet to be designated by the Agency for inspection.

41. In accordance with the approach which he had outlined, whenever information was provided on a particular location, complementary access would also be provided at that location.

42. In his view, that approach to the implementation of Protocol measures would enable the United Kingdom to contribute fully to the agreed aims of the Protocol. When implementing individual measures, it would do so in such a way as to maximize its input to the strengthening of the safeguards system. Whenever action by the United Kingdom as a nuclear-weapon State would serve the aims of the Protocol, it would be ready to act.

43. The Government of the United Kingdom, and also British industry, stood ready to make a full contribution to the implementation of the new and important measures which had been put forward in order to strengthen the international safeguards system. He hoped that the Board would approve the draft Model Protocol as recommended in document GOV/2914 so that the Director General might commence negotiations with all States concerned. He also hoped that all States which had safeguards agreements with the Agency would as soon as possible conclude the necessary additional agreements.

44. Mr. RITCH (United States of America) said his country welcomed the completion of the draft Model Protocol by Committee 24, all members of which - and particularly the Chairman - could take pride in what was an important contribution to international security.

45. During the deliberations of Committee 24, there had been expressions of a strong desire to see all States making contributions to the strengthening of safeguards through the adoption of measures provided for in the draft Model Protocol. He would like to explain the intentions of the United States with regard to acceptance of the draft Model Protocol.

46. On 17 September 1996, in a message from President Clinton read to the General Conference by the United States Secretary of Energy, it had been stated that "The United States firmly supports those measures proposed by the Secretariat in Programme 93+2. The United States stands ready to apply the new measures as fully as possible in our country consistent with our obligations under the NPT."

47. That approach to implementation of the new measures contemplated in Programme 93+2 had been similar to the approach announced by President Johnson in 1967 during the negotiation of the NPT. At that time, President Johnson had stated that the United States was not asking any country to accept any safeguards which the United States was unwilling to accept and that, when safeguards were applied pursuant to the NPT, the United States would permit the Agency to apply its safeguards to all nuclear activities in the United States - excluding only those with direct national security significance.

48. Just as in 1967, when the terms of NPT safeguards agreements had yet to be negotiated, President Clinton's address had come at a time when the package of Programme 93+2 measures had yet to be fully determined. Committee 24 had in September 1996 only just begun negotiating a protocol to strengthen the safeguards system and make it more cost-effective, with the principal objective of enhancing the Agency's ability to detect undeclared nuclear activities.

49. Committee 24 had now finished its work on the draft Model Protocol, the Foreword to which envisaged that the Board would request the Director General "to negotiate additional protocols or other legally binding agreements with nuclear-weapon States incorporating those measures provided for in the Model Protocol that each nuclear-weapon State has identified as capable of contributing to the non-proliferation and efficiency aims of the Protocol, when implemented with regard to that State, and as consistent with that State's obligations under Article I of the NPT."

50. The United States was now in a position to identify those measures which would contribute to the non-proliferation and efficiency aims of the Protocol when implemented with regard to the United States and which were consistent with the United States' obligation under Article I of the NPT not to contribute to the proliferation of nuclear weapons or other nuclear explosive devices.

51. The United States intended to accept the Protocol in its entirety and to apply all of its provisions. It would treat the Protocol as an integral part of its existing voluntary-offer safeguards agreement. That agreement was legally binding, and the United States intended to make the Protocol legally binding. It did not intend to seek any amendments to the Protocol, nor would it seek to amend its existing voluntary-offer agreement. The Administration would propose any legislation needed for the full implementation of the Protocol in the United States.

52. More specifically, under its voluntary-offer safeguards agreement and the Protocol the United States would have a legal obligation to do all the reporting provided for in

Article 2 of the Protocol and to give the Agency complementary access in accordance with the relevant provisions to:

(a) all locations listed in the declarations made by the United States pursuant to Article 2;

(b) any other location in order to conduct location-specific environmental sampling and such follow-on activities as were necessary; and

(c) other locations in order to conduct wide-area environmental sampling should such sampling be approved by the Board in the future.

53. However, the United States could not accept the application of each Protocol provision in all circumstances. Consistently with its existing safeguards agreement, the United States would reserve the right to exclude Agency access under the Protocol to activities of direct national security significance to the United States and to locations and information associated with such activities. No decision had yet been taken on what changes - if any - would be required in order to ensure that the exception provided for in the existing safeguards agreement was also applicable to the Protocol, but that was the only exception which the United States contemplated.

54. Mr. TIWARI (India) said that India had been voicing its concern over the need for a proper safeguards system even before the Agency had been established. As Dr. Homi Bhabha, the founder of India's atomic energy programme, had said in his speech on safeguards during the Conference on the Statute of the Agency in 1956 in New York, India was not against a system of inspection, controls and safeguards but was in favour of devising a system that was adapted to the world's realities. Human nature resented external interference and would tolerate only the minimum necessary, and only as long as it did not arouse fears of a loss of economic independence. In devising a system of controls, the gains to be realized should be weighed against the price to be paid by States in surrendering to inspection.

55. During the discussions on Programme 93+2, his delegation had attempted to address the proposals put forward in a dispassionate and pragmatic manner. The doubts it had expressed regarding the practicalities of implementing certain measures had been motivated by concern about the implications of those measures. It feared that certain incidents of undeclared or clandestine nuclear activities might be used as springboards to make the whole safeguards system unnecessarily intrusive and cost-intensive in the name of strengthening safeguards. The problems highlighted in successive SIRs indicated that even the existing safeguards systems which had been in existence for three decades and required no complementary legal authority, were still not completely free of implementation problems.

56. Turning to Programme 93+2, he said that the Part 1 measures, which were being implemented in countries with comprehensive safeguards agreements, already required a great deal of effort from both the Secretariat and the Member States concerned and had significant cost implications. The Agency should therefore wait a while before proceeding with the implementation of Part 2 measures. As to the promised cost neutrality of the measures to strengthen the safeguards system, his delegation wondered when that would be achieved. The material released from the dismantling of nuclear weapons would present an additional burden and the indications so far were that the Agency would remain totally dependent on obtaining additional manpower and financial resources. Furthermore, his delegation was concerned that the future of the Agency's promotional activities might be compromised as the organization continued to pursue its role as an international nuclear policeman.

57. With regard to the scope of application of the Model Protocol he reiterated that the rationale behind the Protocol's provisions was to detect undeclared nuclear facilities in countries with comprehensive safeguards agreements. India had consistently maintained that the Model Protocol could not be applied to States with INFCIRC/66-type agreements; the extension of the scope of the Protocol to such States was legally untenable and almost impossible to enforce. As the Director General had noted in his opening statement to the previous year's session of the General Conference, the central rationale for strengthening

safeguards verification in States with comprehensive safeguards, namely to increase confidence about their compliance with their non-proliferation pledge, did not apply to States with non-comprehensive safeguards, as they had made no such pledge.

58. India was not opposed to the programme of safeguards or to the strengthening of the safeguards system with a view to making it more efficient and more cost-effective, and would continue to honour, both in spirit and letter, its facility-specific safeguards agreements with the Agency. Although India was not a member of the Nuclear Suppliers Group, it had never been a party to the clandestine export of sensitive nuclear equipment or technology and remained committed to universal nuclear disarmament. However, only when India was satisfied that its legitimate concerns, including those regarding security, had been met would it be prepared to open a fresh dialogue on its existing safeguards agreements.

59. Mr. SABURIDO (Cuba), having thanked the Chairman and his predecessor for the manner in which they had conducted the work of Committee 24, said that his country continued to believe that the application of the measures foreseen by the Protocol in countries with INFCIRC/66-type agreements had no legal basis and would not be feasible. Furthermore, it would go beyond the Committee's mandate. There were often very different reasons why countries with INFCIRC/66-type agreements had not agreed to accept INFCIRC/153-type safeguards. The non-proliferation regime was highly discriminatory and universality was not a realistic goal at the present juncture. In Cuba's opinion the total elimination of nuclear weapons was the only solution to the problem.

60. His Government complied fully with its two INFCIRC/66-type safeguards agreements. INFCIRC/281 concerned the Juraguá nuclear power plant and INFCIRC/311 related to a zero-power nuclear reactor. Some years previously, his Government had decided not to continue with the reactor's construction and had requested negotiations with the Agency on an exemption from safeguards, since the facility would never become operational. The supplies on Cuban territory for the two installations had never included nuclear fuel.

61. Although Cuba's nuclear programme was modest in size, it was in general well structured. The construction of the Juraguá nuclear power plant had been halted temporarily in 1992 even though its viability and safety from the technical point of view had been demonstrated. Regrettably, factors outside Cuba's control were preventing the construction work from resuming.

62. Nuclear power was only one of the peaceful uses of nuclear energy where Cuba was facing serious difficulties in continuing to make progress. Cuba had successfully introduced nuclear techniques in medicine, agriculture and other industrial applications, with significant social benefits. Its nuclear programme was transparent and purely peaceful in nature, and international co-operation was welcome. It highly valued the technical co-operation and support it received from the Agency, with which it had some years earlier concluded a Revised Supplementary Agreement. However, there was sufficient evidence to indicate that Cuba's right to gain access to nuclear technology was consistently being violated. The free transfer of technology could not be ensured by Cuba's signature of bilateral agreements or instruments, but depended on a minority of countries accepting once and for all that Cuba was a free and sovereign State. The current climate of hostility and confrontation darkening the good-neighbourly relations which ought to prevail in all regions should then cease to exist.

63. Cuba's will to become more closely linked to the Latin American countries had been illustrated by the Government's decision to sign the Tlatelolco Treaty on 25 March 1995. Although an overwhelming majority of countries had welcomed that decision, a small minority had prevented Cuba from continuing to further its objective. In that connection, he recalled the words of the Cuban Foreign Minister to the effect that Cuba would continue to pay particular attention to the work of OPANAL and would not jeopardize the objectives of the Tlatelolco Treaty.

64. His Government had the political will to continue considering measures provided for in the Model Protocol with a view to their possible adoption. However, its action would be linked closely to the establishment of a climate of peace and the full respect of Cuba's

relations with all nuclear-weapon States. In addition, all the restrictions on his country, including the economic, commercial and financial blockade, must be lifted and the relevant legislation revoked.

65. Cuba's ratification of the Chemical Weapons Convention was yet another illustration of its firm commitment to universal disarmament at the international level. It would continue to move forward, in accordance with its foreign policy principles, but would not respond to pressure and bribery, however powerful the tools used to hinder its activities.

66. Mr. AMIR (Israel)*, having congratulated the Chairman on the manner in which he had conducted Committee 24's work, said that Israel supported the strengthening of safeguards and believed that the Model Protocol would improve the safeguards system considerably. However, compliance could not be guaranteed through safeguards alone and consistent political determination as well as a favourable political culture with a system of checks and balances were also necessary. The experience of UNSCOM should serve as a warning in that regard.

67. Israel considered that the Model Protocol was not relevant to States with INFCIRC/66-type agreements. Accordingly, it was not in a position to support the calls for the Director General to begin negotiations on additional protocols with States having such agreements. Nevertheless, it would continue to respect all its safeguards commitments and to support non-proliferation by adhering to export control regimes such as the Missile Technology Control Regime, the Nuclear Suppliers Group and the Australia Group, and it would consider voluntarily the relevance of measures in the Model Protocol that were consistent with its policy and safeguards undertakings.

68. Mr. AYATOLLAHI (Islamic Republic of Iran)*, having congratulated the Chairman on his leadership skills, said that the Model Protocol, like INFCIRC/153-type safeguards agreements, stemmed in spirit and letter from the Non-Proliferation Treaty. While the NPT could be criticized for being discriminatory, it was the backbone of the

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* Member States not members of the Board of Governors are indicated by an asterisk.

existing non-proliferation regime, and any criticism should rather be directed at the nuclear-weapon States and non-nuclear-weapon States which had not complied with their commitments under the Treaty. He welcomed the measures taken recently to begin dismantling nuclear weapons and to submit the weapons-grade material they contained to the Agency for safeguards verification, and he hoped that such examples would be followed in all nuclear-weapon States until a world free of nuclear weapons was finally achieved. Genuine efforts by all the signatories to the NPT could help to compensate for opportunities lost in previous decades.

69. With regard to Programme 93+2, his delegation felt that the Model Protocol had, regrettably, evolved in an atmosphere influenced greatly by reports of non-compliance by two Member States. However, he trusted that with the understanding and co-operation of Member States and the Agency, problems would not arise in the implementation of the Protocol.

70. The issue of the Model Protocol universality had not been settled in a satisfactory manner. In the absence of universality, there were genuine calls for the regional implementation of the Agency's safeguards verification measures. In the Middle East region, Israel had been posing a nuclear threat by not undertaking international safeguards commitments, acceding to the NPT or accepting the establishment of a nuclear-weapon-free zone - even though other countries had done so. Such great differences of approach might make implementation of the Protocol problematic.

71. The large volume of information to be supplied by signatories to the Protocol would increase the administrative burden on Member States, at least in the short term, and greatly add to the Secretariat's workload. Moreover, since the Secretariat would have access to a broad range of information resulting from inspections and monitoring, it was essential that it should remain independent and impartial, not in any way using the Protocol as a political tool in favour of some Member States against others, and that it should do everything in its power to protect the confidentiality of safeguards-relevant information. In that context, he commended the Secretariat on the document outlining the regime for the protection of such

information and noted that while the Secretariat should be entitled to receive the information from any sources, the suppliers thereof should take some responsibility for its accuracy.

72. Another problem which might be encountered in practice was that some of the provisions foreseen by the Model Protocol might conflict with national regulations in certain Member States. If it was not possible to reconcile national legislation with the Protocol's provisions, implementation might prove to be difficult.

73. Finally, the spirit of Article IV of the NPT should have been given more emphasis in the Protocol, by making it clear that the strengthened safeguards regime in general and the Model Protocol in particular should offer a means of providing credible assurances of nuclear non-proliferation while at the same time enabling the commercial aspects of the peaceful uses of nuclear energy to be exploited for the benefit of the developing world.

74. Mr. JAMEEL (Pakistan)* said that his country was in favour of strengthening the effectiveness and improving the cost-efficiency of the Agency's safeguards system and had, in that spirit, participated constructively in Committee 24's work. However, as Programme 93+2 focused on the detection of undeclared activities and facilities, it was neither relevant nor logical to suggest that the scope of the Programme should be extended to countries with item-specific safeguards agreements, and indeed Pakistan would find it unacceptable to consider applying any parts of the Protocol to countries with exclusively INFCIRC/66-type agreements. His country therefore continued to have strong reservations concerning the fourth paragraph of the Foreword to the draft Protocol and suggested that it be deleted.

75. The CHAIRMAN said he assumed that the Board wished to take note of the statements made by States not having comprehensive safeguards agreements in order to set forth their positions with respect to the measures provided for in the Model Protocol.

76. It was so agreed.

CONSIDERATION OF THE REPORT OF THE COMMITTEE AND OF THE DRAFT MODEL PROTOCOL
(GOV/2914)

77. Mr. FÖRSTER (Netherlands), speaking on behalf of the European Union and the associated countries Bulgaria, Cyprus, Czech Republic, Hungary, Lithuania, Romania, Slovakia and Slovenia, congratulated the Chairman on the results achieved in the Committee and thanked the Secretariat for its work. Members of the European Union and the associated countries had been some of the most active participants in the Committee's discussions, drawing on their experience as countries in a region with one of the world's largest concentrations of both nuclear industries and safeguards agreements.

78. The Model Protocol submitted for the Board's endorsement was a well-balanced set of measures which the European Union supported as part of the larger programme to strengthen the Agency's safeguards system and enhance the international nuclear non-proliferation regime. The adoption of the measures provided for in the Protocol would give the Agency the necessary powers to fulfil its role in accordance with the conclusions of the 1995 NPT Review and Extension Conference and the decision taken there on principles and objectives for nuclear non-proliferation and disarmament. The effectiveness and efficiency of the safeguards system would be enhanced significantly if all States committed themselves to implementing the measures provided for in the Model Protocol. The nuclear-weapon States had already identified the measures that they were prepared to accept on a legally binding basis, and he called upon all States and other parties to safeguards agreements to begin negotiations with the Agency for the conclusion of appropriate additional protocols with a view to implementing Programme 93+2 as soon as possible. The members of the European Union would initiate procedures shortly and expected other countries to do the same.

79. The confidentiality of the information provided by Member States after the Protocol had entered into force must be closely guarded and, while the document outlining the regime for the protection of safeguards confidential information constituted a basis for that endeavour, it was by no means a definitive set of rules. The issue of confidentiality should

therefore be addressed at a subsequent meeting of the Board. Furthermore, the information provided should be analysed and its value assessed.

80. Finally, he would welcome regular status reports from the Secretariat on the negotiation, conclusion and implementation of additional protocols as well as updated estimates on the funds required and the efficiency gains made so that Board members could draw conclusions on the expected cost neutrality of Programme 93+2.

81. Mr. BORCHARD (Germany), having commended the Chairman on his skilful chairmanship and the Committee on reaching a consensus on the Model Protocol, endorsed the statement made on behalf of the European Union. Once the Model Protocol had been approved by the Board, the main priority would of course be to ensure its timely adoption on as universal a basis as possible. In implementing the new measures, the Agency should proceed with "a certain degree of parallelism", as mentioned by the Chairman in the first meeting of the Committee's January session[1]. In that context, he particularly welcomed the undertaking by the United States to apply the provisions of the Model Protocol to all its nuclear activities with the sole exception of those having direct national security significance. He also welcomed statements along similar lines by other States that did not have comprehensive safeguards agreements which he hoped would prove to indicate the same degree of acceptance of the new measures.

82. High priority should also be given to integrating the measures foreseen in the Model Protocol and the Part 1 measures of Programme 93+2 already approved by the Board into the classical safeguards system in order to improve its efficiency and effectiveness, while providing protection against unwarranted intrusiveness.

83. On a legal level, that integration would be achieved under Article 1 of the additional protocols, which indicated the relationship between those protocols and the respective safeguards agreements. The interpretation of that relationship had already been documented in the Committee's summary records[2] and was to be endorsed by the Board in

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1 See GOV/COM.24/OR.24, para. 21.

2 See GOV/COM.24/OR.48, paras 2-7.

paragraph 15(c) of document GOV/2914. On a technical level, it would be necessary to rely more on regional safeguards and on State systems of accounting and control, to concentrate further on direct-use material, and to offset the measures involving the provision of in-depth information and extended access by a reduction in mechanistic counting of sheer numbers.

84. In conclusion, he supported the Board action recommended in paragraph 15 of document GOV/2914.

85. Mr. EL-FEKI (Egypt), noting that the efforts of both Member States and the Secretariat had been instrumental in ensuring the successful conclusion of the first comprehensive review of the safeguards system since the 1970s, welcomed the statements that had been made by the five nuclear-weapon States, which were steps in the right direction.

86. In the light of the action recommended in paragraph 15(e) of document GOV/2914, which requested the Director General to proceed as set forth in the Foreword to the Model Protocol, he expected the Agency to move on three fronts in parallel: with nuclear-weapon States, with States not party to the NPT, and with NPT States. He would have hoped that statements along the lines of those made by the nuclear-weapon States would also have been made by States that were not party to the NPT and that did not have comprehensive safeguards agreements, but Egypt had decided not to obstruct the Board's approval of the Model Protocol even though such statements had not been forthcoming. Nevertheless, it was to be hoped that the Board's efforts to strengthen the non-proliferation regime would encourage nuclear-weapon States and States that had chosen to remain outside the NPT also to take non-proliferation and nuclear disarmament measures so that the strengthening of the Agency's safeguards system would not actually increase the disparity and discrimination between those States and the non-nuclear-weapon States Party to the NPT.

87. While many of his delegation's comments on the proposed measures had been taken into account during the drafting of the Model Protocol, a number of general comments on questions of principle remained which would have to be borne in mind during

implementation and interpretation of the Protocol in order to strike a proper balance between the need to ensure the effectiveness of the safeguards system and the need to respect the sovereign rights of States.

88. Mr. STULLER (Czech Republic), having thanked the Chairman for his able leadership and endorsed the European Union statement, said that he was particularly satisfied with paragraph 14 of document GOV/2914 because it indicated that agreement had been reached on how the Board could amend Annexes I and II using a simplified procedure.

89. With regard to the expectation that adoption of the draft Model Protocol would lead to increased effectiveness and efficiency of safeguards, he noted that that would be so only if the measures foreseen were really applied in the daily working practices of both Member States and the Secretariat.

90. Recalling the lengthy negotiations and consultations that had taken place within the framework of Committee 24 and the difficulties that had been encountered in finding acceptable formulations, he said he was sure that all delegations could identify some parts of the Model Protocol that might have been expressed better or that could still be amended. Nevertheless, he believed that the final text was a good one and supported its adoption in its present form.

91. Turning to the scope of the Protocol's application, he said that his delegation, unlike some others, continued to believe that the provisions of the Protocol were applicable also to States that did not have INFCIRC/153-type agreements. He accordingly called upon those States to negotiate additional protocols containing measures provided for in the Model Protocol.

92. In conclusion, he recommended that the Board take the action suggested in paragraph 15 of document GOV/2914.

93. Mr. PESCI BOUREL (Argentina) noted that, while many political, legal, technical and financial aspects had not been completely resolved, the current text of the

draft Model Protocol nevertheless represented an acceptable balance between the need to widen the Agency's scope in monitoring nuclear activities, on the one hand, and the need to respect the sovereign rights of Member States, on the other. Adoption of the Model Protocol would be an effective step towards strengthening the nuclear non-proliferation regime. Argentina's firm support for the international community's efforts to achieve greater global security was well known, and his Government would adopt a similar attitude with respect to the entry into force and application of the Model Protocol. The successful implementation of the new safeguards system would depend on the determination of Member States and the Secretariat to work together to attain the common objective.

94. The measures covered by the Model Protocol, as well as those already approved at the beginning of 1992 and those relating to Part 1 of Programme 93+2 adopted in 1994, were basically qualitative measures that represented a major change from the quantitative approach of the existing system. The effective and efficient integration of both approaches would therefore offer a real challenge to the Secretariat, which would have to display considerable prudence and flexibility. In applying the new integrated system, the Secretariat would have to take into account both the specific nature of the basic safeguards agreements - to which in the case of Brazil and Argentina ABACC was also a party - and the special characteristics of the various nuclear programmes of individual Member States. The Secretariat would also have to maintain strict confidentiality in handling the information it obtained. In that context, he welcomed the establishment by the Board of an intergovernmental group of experts to make recommendations aimed at strengthening the existing regime for the protection of confidential information.

95. As to the Protocol's scope, Argentina believed that it should apply to all States through legally binding commitments, which would obviously have to take into account the characteristics of different types of safeguards agreements. He trusted that the statements made by the nuclear-weapon States would be put into practice. In particular, he welcomed the official position taken by the Government of the United States, which he was confident would facilitate the political decision-making process with respect to the Protocol in other countries.

96. In conclusion, he said that his delegation was in favour of adopting the action recommended in document GOV/2914 and expressed the hope that the Board of Governors, duly informed by the Secretariat, would continuously monitor the signing by Member States of additional protocols and their practical implementation.

97. Mr. ADAM (Belgium), having joined others in thanking the Chairman and the Secretariat and having expressed his full support for the statement made by the Governor from the Netherlands on behalf of the European Union and associated States, noted that Belgium had always supported the objectives of Programme 93+2 and had participated actively in the drafting of the Model Protocol.

98. Belgium firmly believed that safeguards should be applied universally and that the international community as a whole should participate in the efforts to strengthen the safeguards system and create an effective worldwide non-proliferation regime. In particular, a major contribution by the nuclear-weapon States would be needed to ensure effective implementation of Programme 93+2. He had therefore noted with interest the intention of those States to conclude with the Agency binding agreements based on the Model Protocol in addition to their voluntary offers. Regarding the substance of those agreements, he concurred with the representative of China that history and conditions of nuclear development might mean there would be differences in terms of the commitments made. He particularly welcomed the United States offer to accept the Protocol in its entirety and apply all of its provisions, subject to the need to protect data concerning the military nuclear programme and to the obligations under Article 1 of the NPT. Such a commitment was likely to facilitate the adoption of additional protocols by many non-nuclear-weapon States, and he sincerely hoped that other nuclear-weapon States would make similar commitments.

99. As had been mentioned in the European Union statement, it was important that the Board should be kept regularly informed of the conclusion and implementation of additional protocols by States and other parties having safeguards agreements with the Agency, including nuclear-weapon States and States that had INFCIRC/66-type

agreements, which he called upon also to contribute to the implementation of Programme 93+2 so as to strengthen the international non-proliferation regime.

100. Mr. EL FADHEL KHALIL (Tunisia) reiterated his country's commitment to strengthening the international nuclear non-proliferation regime. Just as it favoured the promotion of the peaceful uses of nuclear science and technology, so it also endorsed efforts to ensure that nuclear energy was not used for activities prohibited under the NPT. It therefore supported the Model Protocol and was willing to contribute to its application.

101. The successful implementation of the strengthened safeguards programme would depend on meeting several conditions: on maintaining a balance between the new commitments undertaken by States and respect for their sovereign rights; on ensuring that there was no increase in contributions by States having neither nuclear weapons nor nuclear facilities and no reduction in the resources allocated to technical co-operation activities; on a universality achieved through acceptance by nuclear-weapon States of some of the measures accepted by States with comprehensive safeguards agreements and through the adoption by States with INFCIRC/66-type agreements of additional protocols containing measures included in the Model Protocol; and on ensuring the infallibility of the regime for the protection of safeguards confidential information by regularly updating and improving it.

102. With those remarks, his delegation recommended that the Board adopt the measures set out in paragraph 15 of document GOV/2914.

103. Mr. TIWARI (India), while endorsing the action recommended in paragraph 15, drew attention to the fourth paragraph of the Foreword to the Model Protocol, which as drafted suggested that additional protocols could be negotiated with States that had INFCIRC/66-type agreements. As his delegation had repeatedly stated, the aim of the Model Protocol being to detect undeclared nuclear activities and facilities, it could not legally and practically be applied to States with INFCIRC/66-type agreements such as India, since such States by definition had undeclared nuclear activities.

104. Mr. Seung-Kon LEE (Republic of Korea), having congratulated the Chairman on the successful conclusion of Committee 24's work, said that most of the substantial issues had been resolved through compromise, with a good balance being struck between the Agency's need for more information and access on the one hand, and States' need to protect their legitimate interests on the other. Implementation of the new measures would significantly enhance the Agency's ability to detect undeclared nuclear materials and activities. The participation of States that did not have comprehensive safeguards agreements, particularly nuclear-weapon States, would much improve the effectiveness of those measures and would be a step forward towards a more universal non-proliferation system. In that context, he noted the statements made by the nuclear-weapon States earlier in the meeting.

105. During the discussions in Committee 24, his delegation had gone into the issue of confidentiality at length because it had felt that it was the most sensitive and crucial element of Part 2 of Programme 93+2. While the Agency had so far maintained an impeccable record on confidentiality, his delegation still believed that a different approach was required for Part 2 measures, since the Agency would in future be handling very sensitive commercial information and industrial secrets. His delegation therefore looked forward to the strengthened regime for the protection of safeguards confidential information to be proposed by the Secretariat later in the year and emphasized the importance of periodic review and updating of the Agency's regime by the Director General and by the Board as provided in Article 15 of the Model Protocol.

106. The new measures contained in the Model Protocol were designed not only to strengthen the effectiveness of the safeguards system, but also to improve its efficiency. A balance between effectiveness and efficiency was thus required, and he hoped that those States which would bear an additional burden from the strengthened safeguards system would eventually benefit from a reduction where routine safeguards activities were concerned. The inspection frequency, for example, at low-proliferation-risk facilities should be readjusted accordingly.

107. With those comments, his delegation was ready to approve the report of Committee 24 as contained in document GOV/2914 and the action recommended in paragraph 15.

108. Mr. MAYOR (Switzerland) congratulated the Chairman and the Secretariat on their efforts, which had made it possible to achieve the objective in a timely fashion.

109. Switzerland welcomed the United States intention to apply all the measures provided for in the Protocol with the exception of those directly affecting its national security. It was regrettable that other nuclear-weapon States had not made the same commitment. Their position was not in accordance with the principle of universality or with the basic goal of strengthening the global non-proliferation regime by comprehensive application of the Model Protocol. He hoped those countries would reconsider their decision to restrict the scope of application of Programme 93+2, for a change in the position of those countries would enable non-nuclear-weapon States to adopt additional protocols more easily and thus ensure swift entry into force.

110. The competent Government officials and experts in the nuclear field in his country were satisfied with the Committee's report and the draft Model Protocol. The next stage would be to submit those documents to Switzerland's parliamentary institutions and, if necessary, to adapt national legislation in order to permit the signing and implementation of the additional protocol. Before taking a decision, the Swiss Parliament would await with interest the practical application of the statements made by the five nuclear-weapon States in the form of additional safeguards agreements with the Agency and the adaptation of the corresponding national legislations to permit their entry into force.

111. Mr. MACKINNON (Canada) welcomed the draft Model Protocol and the Committee's report and looked forward to entering into negotiations with the Agency on an additional protocol to the bilateral safeguards agreement between Canada and the Agency at a mutually convenient early date.

112. A safeguards system that was appropriate to a world with tens of thousands of nuclear weapons would not be appropriate to a world with significantly fewer such

weapons. Safeguards would have to become an integral aspect of national security arrangements in all countries, and indeed significantly strengthened safeguards were a prerequisite for any further substantial nuclear disarmament. Programme 93+2 was only a first step but it was an important one.

113. A new way of implementing safeguards would have to be found if they were to be both efficient and effective in future. The intensity of the Agency's safeguards effort could not continue to be based simply on the size of a State's peaceful nuclear power programme. If, through the provision of broader information and expanded access, States could give credible assurances that they have no undeclared nuclear material or activities, the intensity of safeguards applied to their nuclear power reactors could and should be decreased.

114. In conclusion, he supported the action by the Board recommended in paragraph 15 of document GOV/2914.

The meeting rose at 1 p.m.

International Atomic Energy Agency
BOARD OF GOVERNORS

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RECORD OF THE NINE HUNDRED AND FOURTEENTH MEETING

Held at Headquarters, Vienna,
on Thursday, 15 May 1997, at 3.15 p.m.

CONTENTS

[*] GOV/2912.

97-01903 (XXVIII)

Attendance

(The list below gives the name of the senior member of each delegation who attended the meeting, as well as that of any other member whose statement is summarized in this record.)

Mr. P. WALKER	Chairman (Canada)

Mr. MAFFEI	Argentina
Mr. JOSEPH	Australia
Ms. CLAEYS	Belgium
Mr. de OURO-PRETO	Brazil
Mr. I. PETROV	Bulgaria
Mr. MACKINNON	Canada
Mr. SILVA HENNINGS	Chile
Mr. FU Manchang	China
Mr. AGUIRRE AGUIRRE	Colombia
Mr. SABURIDO	Cuba
Mr. STULLER	Czech Republic
Mr. BOEL ABRAHAMSEN	Denmark
Mr. NASSER	Egypt
Mr. PRETTRE	France
Mr. SANDTNER	Germany
Mr. RAGHURAMAN	India
Mr. IKEDA	Japan
Mr. Chan Ho HA	Korea, Republic of
Mr. AL-GHAIS	Kuwait
Mr. RAJA ADNAN	Malaysia
Mr. LISWANISO	Namibia
Mr. FÖRSTER	Netherlands
Mr. COOK	New Zealand
Mr. AGEV	Nigeria
Mr. ALCANTARA de MELO	Portugal
Mr. PUTINEANU	Romania
Mr. PAVLINOV	Russian Federation
Mr. AL-TAIFI	Saudi Arabia
Ms. MXAKATO-DISEKO	South Africa
Mr. MAYOR	Switzerland
Mr. BOUZOUITA	Tunisia

Attendance
(Contd.)

Mr. AL-YASIRI		United Arab Emirates
Mr. HEATHCOTE		United Kingdom of Great Britain and Northern Ireland
Mr. RITCH	}	United States of America
Mr. WULF	}	

Mr. BLIX	Director General
Mr. PELLAUD	Deputy Director General, Department of Safeguards
Mr. SANMUGANATHAN	Secretary of the Board

Representatives of the following Member States attended the meeting:

Algeria, Austria, Croatia, Finland, Greece, Holy See, Indonesia, Islamic Republic of Iran, Ireland, Israel, Italy, Jordan, Lebanon, Lithuania, Luxembourg, Mexico, Morocco, Pakistan, Peru, Philippines, Poland, Slovakia, Spain, Syrian Arab Republic, Thailand, Turkey, Ukraine, Viet Nam.

Abbreviations used in this record

ABACC	Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials
Committee 24	Committee on Strengthening the Effectiveness and Improving the Efficiency of the Safeguards System
DPRK	Democratic People's Republic of Korea
NPT	Treaty on the Non-Proliferation of Nuclear Weapons
NPT Review and Extension Conference	Review and Extension Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons
SAGSI	Standing Advisory Group on Safeguards Implementation
SSAC	State System of Accounting for and Control of Nuclear Material
WMO	World Meteorological Organization
World Bank	International Bank for Reconstruction and Development
WPPR	Working Planning and Performance Review
WWER	Water-cooled and -moderated reactor
XRF	X-ray fluorescence

CONSIDERATION OF THE REPORT OF THE COMMITTEE AND OF THE DRAFT MODEL PROTOCOL (continued)
(GOV/2914)

1. Mr. RAJA ADNAN (Malaysia), after commending the Chairman on his guidance of the deliberations of Committee 24 and the Secretariat on its support and hard work under the Director General's leadership, said that his country had long called for the strengthening of the nuclear non-proliferation regime as a means of preventing horizontal and vertical proliferation and for tangible measures to achieve nuclear disarmament as soon as possible. Malaysia believed that nuclear weapons should be outlawed in the same way as chemical and biological weapons. Despite its disappointment that the NPT had been extended indefinitely and not for a fixed period, Malaysia still regarded the Treaty as the cornerstone of global efforts to curb the spread of nuclear weapons and to promote the peaceful uses of nuclear energy.

2. The Model Protocol and the implementation of the measures developed under Programme 93+2 would substantially strengthen the Agency's safeguards system. However, it was essential that the new arrangements for the monitoring and verification of nuclear material and activities should also apply to the nuclear-weapon States and other States that were not party to comprehensive safeguards agreements. He therefore welcomed the fact that the five nuclear-weapon States intended to apply those measures provided for in the Model Protocol which each of them believed could contribute to the non-proliferation and efficiency aims of the Protocol and were consistent with its obligations under the NPT. As well as providing a high level of assurance of non-diversion and of the absence of undeclared material and activities, the Model Protocol would also facilitate the further transfer of technology in general, and of nuclear technology in particular.

3. While it was understandable that export controls should be obligatory for any State Party to the NPT capable of transferring nuclear or nuclear-usable technology, Malaysia, not being a nuclear supplier, was primarily concerned about the effect that the export controls on items listed in Annex II might have on its efforts to maintain minimal

regulation of its export trade. As the list in Annex II was to be implemented as part of a voluntary reporting scheme and as the majority of developing countries had been excluded from the discussions on that list, Malaysia welcomed the proposed open-ended working group of experts to be established by the Board to review and amend the lists contained in Annexes I and II. The group would serve as a forum for co-operative dialogue between suppliers and non-suppliers of nuclear material and equipment.

4. Problems were likely to arise during the implementation of the export controls in countries such as his own because the way that the items were described would make it difficult even for nuclear scientists to identify them, let alone customs officials, and because his Government did not attach national priority to the controlled items in question, which were not produced in Malaysia and were not likely to be in transit through Malaysia in the near future.

5. In the light of those considerations, it would be desirable for the Agency to assist all interested parties in the creation of an export control system and in training, including the provision of manuals for customs officers The benefits to be derived from such assistance would justify the costs and if those problems were not tackled early, they would multiply once reporting of the dual-use items in Annex II was introduced.

6. In conclusion, he reiterated his Government's firm conviction that the introduction and implementation of new measures and methods to strengthen the effectiveness and improve the efficiency of comprehensive safeguards should not in any way restrict peaceful nuclear technical co-operation and technology transfer. With those comments, Malaysia could support the recommended action contained in paragraph 15 of document GOV/2914.

7. Mr. IKEDA (Japan) thanked the Chairman for his able guidance of the Committee's negotiations and the Secretariat for its very valuable assistance. His delegation was convinced that the effectiveness and efficiency of Programme 93+2 would be enhanced if it was implemented not only by States with comprehensive safeguards agreements, but also by States with other types of agreement. He therefore welcomed the announcement by the United States that it intended to accept the Protocol in its entirety and

to apply all of its provisions, with the exception of those affecting activities of direct national security significance. It was to be hoped that the United States would interpret that exception as narrowly as possible and that the other nuclear-weapon States would adopt the straightforward position of the United States.

8. It was important to remember that all the measures provided for in the Model Protocol were important for improving and strengthening the global non-proliferation regime. Furthermore, the introduction and application of the Protocol in many non-nuclear-weapon States would proceed more smoothly if the nuclear-weapon States took positive action in accordance with the third paragraph of the Foreword to the Protocol. Japan would take a close interest in their efforts in that regard. It was also to be hoped that the countries with INFCIRC/66-type agreements would accept in full the measures provided for in the Protocol, thereby contributing to the objectives of Programme 93+2 and to global nuclear non-proliferation.

9. Turning to the application of the Protocol, he said that the effectiveness of Programme 93+2 depended on all States implementing the measures provided for in the Protocol and it was likely that a certain degree of parallelism would be necessary. Once the Protocol had been adopted by the Board, guidelines and procedures for the collection of information in accordance with the provisions of the Protocol would need to be formulated in order to ensure its smooth introduction and implementation. Since it was important to improve efficiency as well as effectiveness, the introduction of advanced techniques and increased co-operation among SSACs was most welcome. His delegation would appreciate being informed by the Secretariat what specific benefits were expected from those efforts, to which Japan was willing to contribute.

10. Mr. AL-GHAIS (Kuwait), having congratulated the Chairman and the Secretariat on the successful outcome of their work, said that his country, which had supported Programme 93+2 since its inception, welcomed the Model Protocol as a major accomplishment in the context of the efforts to free the world from weapons of mass destruction.

11. That achievement was all the more welcome bearing in mind the events in Iraq and the DPRK which had first highlighted the need for a more effective and efficient safeguards system. The Iraqi experience in particular had shown the need to expand the safeguards system to cover undeclared nuclear sites and had clearly demonstrated that the mere existence of a safeguards agreement was not always sufficient to ensure sincere compliance with its provisions.

12. The scope of the Protocol should be universal and not confined to countries with comprehensive safeguards agreements. Otherwise, countries would have unequal responsibilities and some countries would effectively be rewarded for not signing the NPT. It would therefore have been preferable to have used stronger language in the fourth paragraph of the Foreword referring to negotiations with non-nuclear-weapon States with non-comprehensive safeguards agreements.

13. The statements made by the nuclear-weapon States indicating their willingness to adopt some of the Protocol's provisions on a voluntary basis were most welcome. In particular, he was pleased that the United States intended to apply all the provisions except where they affected its national security and trusted that the notion of "national security" would be interpreted as narrowly as possible. It would be desirable for the other nuclear-weapon States to adopt a similar position.

14. It was to be hoped that the Protocol would strengthen efforts to establish the Middle East as a nuclear-weapon-free zone, but it was clear that that could only be achieved if all States acceded to the NPT, complied strictly with their safeguards commitments and adopted a responsible attitude.

15. Referring to the request made by the representative of the Netherlands on behalf of the European Union and associated countries for the Secretariat to provide the Board with regular reports on the status of negotiations of individual protocols with Member States having comprehensive safeguards agreements, he said that he supported that request. In addition, he would appreciate regular reports, at intervals to be determined by the Director

General, on his negotiations with the nuclear-weapon States and States that did not have comprehensive safeguards agreements.

16. Finally, calling upon all countries to sign additional protocols as soon as possible so that the implementation stage could begin, he endorsed the recommended action contained in paragraph 15 of document GOV/2914.

17. Mr. PUTINEANU (Romania), after expressing support for the statement made on behalf of the European Union and associated countries, congratulated all concerned on the successful conclusion of the Committee's work. The Board now had a unique opportunity to approve a set of measures which, if implemented by both nuclear-weapon States and non-nuclear-weapon States, would significantly enhance the Agency's ability to detect undeclared nuclear material and activities. For its part, Romania, having already contributed to the implementation of measures contained in Part 1 of Programme 93+2 and, on a voluntary basis, to that of some contained in Part 2, looked forward to concluding an additional protocol with the Agency.

18. The first priority was to achieve the widest possible application of the new safeguards measures. Accordingly, he welcomed the willingness expressed by the nuclear-weapon States to contribute to the implementation of Programme 93+2 and appealed to all States, regardless of the type of safeguards agreement that they had concluded with the Agency, to implement those measures which they considered appropriate to the development of the peaceful utilization of nuclear energy and international nuclear co-operation.

19. With those comments, his delegation could approve the recommended action contained in paragraph 15 of document GOV/2914.

20. Ms. MXAKATO-DISEKO (South Africa) congratulated the Chairman, Member States and the Secretariat on the successful conclusion of the work of Committee 24 and looked forward to the early start of the process of negotiating individual agreements between the Agency and Member States so that the new measures would become effective on a global scale as soon as possible.

21. South Africa believed that the new strengthened safeguards system would make a significant contribution towards realizing the aims of the NPT, by providing greater assurance of the non-diversion of nuclear material and the non-proliferation of nuclear weapons. From the outset, her country had supported and been involved in the process of developing a strengthened safeguards system, in particular through its participation in the environmental sampling trials. Moreover, the Agency's experience in verifying the completeness of the dismantling of South Africa's nuclear weapons programme had been very useful in evaluating the extent to which safeguards measures needed to be strengthened.

22. Her delegation attached particular importance to the improved efficiency that the Protocol was expected to achieve. In that regard, South Africa was pleased to be participating in the experiments on remote monitoring which, in their final form and when universally applied, would bring about efficiency savings in the area of inspections.

23. Turning to the issue of universality, she stressed that the universal application of certain features of the strengthened safeguards system was indispensable to their effectiveness. South Africa therefore welcomed the fact that the nuclear-weapon States had agreed to comply with those minimum requirements, and that some of them had gone even further by taking on additional commitments.

24. Finally, having urged all non-nuclear-weapon States without comprehensive safeguards agreements to consider which elements of the strengthened safeguards system they could accept in order to reinforce the global system of non-proliferation and thereby facilitate nuclear disarmament initiatives, she endorsed the recommended action contained in paragraph 15 of document GOV/2914.

25. Mr. I. PETROV (Bulgaria), after congratulating the Chairman on the successful outcome of the Committee's work, said that his country, which had concluded a comprehensive safeguards agreement with the Agency and had always supported and participated in the activities to develop and apply Programme 93+2, fully endorsed the recommended action contained in paragraph 15 of document GOV/2914.

26. His delegation was satisfied that the provisions of the Protocol would provide the Secretariat with the additional information and access needed to improve the Agency's capability to detect undeclared nuclear material and activities in countries with comprehensive safeguards agreements. It believed that the measures provided for in the Model Protocol represented a sound balance between the Agency's verification requirements and the interests of Member States and that the recommendation to strengthen the regime for the protection of safeguards confidential information was important for the Protocol's future implementation.

27. Finally, his delegation joined those which had expressed the hope that all States with INFCIRC/66-type agreements would negotiate additional protocols with the Agency based on measures provided for in the Model Protocol and which had welcomed the statements by the nuclear-weapon States concerning those measures which their Governments intended to implement.

28. Mr. WULF (United States of America) thanked the Chairman for his effective chairmanship of Committee 24 and its members for their co-operation and commitment. In addition, he expressed his appreciation to the Director General, without whose insight and leadership Programme 93+2 would not have been launched and could not have succeeded, and to the Secretariat for so ably assisting the Committee.

29. In September 1996, in both his address to the United Nations General Assembly and his message read to the Agency's General Conference, President Clinton had emphasized the need to strengthen the Agency's ability to carry out its mandate and the need to provide it with the necessary authority and resources to combat the proliferation of nuclear weapons, including the capability to detect undeclared nuclear activities. By negotiating the Model Protocol, Committee 24 had made a substantial contribution towards achieving those goals.

30. He read the following message from President Clinton:

> "I extend my congratulations to all those who worked persistently and successfully to bring before the Board of Governors of the IAEA a draft Model Protocol to strengthen further the international safeguards system. It is satisfying to see that the international community has joined together to create a new set of tools that will strengthen safeguards and thereby serve our mutual non-proliferation interests. The draft Model Protocol now before the Board of Governors represents an important milestone in the path of those who continue to work towards a safer, more secure international community.
>
> "States now have a rare opportunity to take a tangible step forward in the quest for peace. I urge the Board of Governors to approve the draft Model Protocol before it and encourage all States to move promptly to adopt appropriate protocols to their safeguards agreements or other legally binding arrangements containing measures in the Protocol.
>
> "Last September, I said that '... the United States stands ready to accept the new safeguards as fully as possible in our country consistent with our obligations under the NPT.' The United States intends to do so by accepting the Protocol in its entirety and applying all of its provisions except where they involve information or locations of direct national security significance to the United States. It is our intention to make the Protocol legally binding."

31. The Model Protocol was the result of the Board's recognition, in March 1995, that the safeguards system for implementing comprehensive safeguards agreements should provide for verification by the Agency of the correctness and completeness of States' declarations, so as to create credible assurance of the non-diversion of nuclear material from declared activities and of the absence of undeclared nuclear activities.

32. The measures contained in the Model Protocol would have to be implemented in parallel with other measures to strengthen safeguards, such as special inspections, the early provision of design information and the Part 1 measures of Programme 93+2. The adoption and implementation of the Model Protocol would further enhance the credibility of the Agency's safeguards system, strengthen the nuclear non-proliferation regime, and contribute to an environment in which peaceful nuclear co-operation could flourish.

33. In conclusion, he endorsed the recommended action contained in paragraph 15 of document GOV/2914 and urged all States to begin negotiations with the Agency on additional protocols or other legally binding agreements as soon as possible.

34. Mr. COOK (New Zealand) expressed his appreciation to the Secretariat for its contribution to the development of Programme 93+2, and his particular gratitude to the Chairman and his predecessor for guiding the work of Committee 24 to a successful conclusion. He also commended all delegations on the constructive approach they had shown during the negotiations.

35. The Board was about to take an historic decision. The dangers posed by clandestine nuclear programmes had required urgent measures to strengthen the Agency's verification capability. Only by maintaining effective and credible safeguards could the Agency continue to play a crucial role in support of the international non-proliferation system and provide a basis for international security and nuclear disarmament.

36. The development of Programme 93+2 had demonstrated that the Agency could respond decisively to such challenges. The implementation of the Part 1 measures had been an important step forward, and the adoption of the Protocol embodying the Part 2 measures would now provide a structure which significantly enhanced the Agency's ability to detect undeclared nuclear activities.

37. He welcomed the fact that the Committee had been able to complete its work in time to indicate to the recent meeting of the Preparatory Committee for the next NPT Review Conference that the Agency was fulfilling the important task entrusted to it by the 1995 NPT Review and Extension Conference. He hoped that the importance of implementing Programme 93+2 would be fully recognized in the enhanced NPT review process.

38. The widest possible implementation of the measures contained in the Protocol would greatly enhance the effectiveness of the safeguards system. He therefore welcomed the statements by the nuclear-weapon States, particularly the United States, indicating their intention to implement certain provisions of the Protocol and urged other States without

comprehensive safeguards agreements to co-operate and adopt whatever measures were appropriate. Once agreement had been reached on a cut-off convention, even wider application of the measures contained in the Protocol would be required.

39. The Board's approval of the Protocol would conclude one major phase in the strengthening of safeguards and commence another. The priority now was to conclude individual additional protocols as soon as possible so that the measures could be implemented on a global basis. In that connection, his delegation would appreciate regular reports to the Board by the Director General on progress in the negotiation and conclusion of such protocols. For its part, New Zealand was already examining the requirements for the adoption of an additional protocol to its comprehensive safeguards agreement and intended to complete that process as quickly as possible.

40. With those remarks, he could endorse the recommended action contained in paragraph 15 of document GOV/2914.

41. Mr. JOSEPH (Australia), having congratulated the Chairman and the Director General on their skill in guiding the work of Committee 24, said that the Model Protocol represented a major step forward, in that it would oblige Governments to provide the Agency with information in far greater detail than ever before about their nuclear activities. The Agency's inspectors would have expanded rights of access and new technologies would be employed to ensure that States complied with their non-proliferation commitments. As a result, undeclared nuclear activities would become more difficult to conceal and any clandestine nuclear weapons programme would become a more hazardous exercise from the political standpoint. In consequence, the world would become a safer place.

42. The Model Protocol marked an important point in the transition from traditional safeguards, which had worked well before their limitations had finally been exposed, to a more qualitative system which promised not only greater effectiveness, but also significant savings. Although the new system would permit a broader right of access for inspection, the use of new technologies would result in a need for fewer inspections and thus there

would be a lighter burden on the nuclear industry. A further positive characteristic of the new system from the point of view of the nuclear industry was that it had the potential to achieve an effectiveness which would have a favourable impact on public and political opinion, and thus enhance the industry's credibility.

43. The effectiveness of the new arrangements would depend on the number of countries prepared to accept them. His delegation therefore joined others in urging States to begin negotiating individual protocols with a view to their early conclusion. For its part, Australia hoped to complete that process within a few months.

44. In conclusion, he endorsed the request by the representative of the Netherlands, speaking on behalf of the European Union and associated countries, for the Secretariat to supply the Board at regular intervals with status reports on the negotiation and implementation of individual protocols.

45. Mr. AGEV (Nigeria), after congratulating the Chairman on the successful completion of the Committee's work, said that the Model Protocol represented a significant milestone in the efforts of Member States to strengthen the effectiveness and improve the efficiency of the safeguards regime. Its approval would help promote the principles guiding the establishment of nuclear-weapon-free zones.

46. While it was important for Member States to commit themselves fully to the implementation of the Model Protocol, the Secretariat must also remain aware of its own responsibilities, particularly those relating to the protection of confidential information.

47. Noting the varying degrees of commitment to the implementation of the Protocol expressed by the nuclear-weapon States, he said that he hoped that the successful realization of the objectives of Programme 93+2 would not be hindered by the fact that the nuclear-weapon States could not immediately implement certain aspects of the Protocol.

48. In conclusion, his delegation could approve the recommended action contained in paragraph 15 of document GOV/2914.

49. Mr. PAVLINOV (Russian Federation), having called upon all members of the Board to endorse the recommended action contained in paragraph 15 of document GOV/2914 and all States with safeguards agreements with the Agency to start negotiating individual protocols as soon as possible, thanked the Chairman and his predecessor for their effective work that had culminated in agreement on the draft Model Protocol in such a short time, as well as the Director General for his leadership in the preparation of the whole programme to strengthen the effectiveness and efficiency of the safeguards system. He also thanked the staff of the Secretariat, in particular the Deputy Director General for Safeguards and the Assistant Director General for External Relations, for having prepared the excellent document on which the Model Protocol had been based, and for their assistance in overcoming the difficult technical and legal problems that had arisen during the Committee's work. Finally, he thanked the members of the Committee for their constructive and flexible approach to the discussions on the Protocol.

50. Mr. OK (Turkey)* thanked the Chairman for his untiring efforts and able leadership throughout the long hours of the Committee's meetings and the Secretariat for the assistance and highly sophisticated expertise it had provided throughout the process of negotiating Programme 93+2.

51. Turkey, which was committed to the establishment of a strengthened and more efficient safeguards system, welcomed the fact that agreement had been reached on a Model Protocol which endorsed those aims and whose principal objective was to enhance the Agency's ability to detect undeclared nuclear activities. Implementation of the measures contained in Programme 93+2 would mark the beginning of more transparent and controllable nuclear activities worldwide. Turkey had already agreed to implement Part 1 of the Programme and had also begun operating the voluntary reporting scheme on exports and imports.

52. With regard to the universality of the new measures, the results achieved were not entirely satisfactory, but represented a step in the right direction. She welcomed the

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* Member States not members of the Board of Governors are indicated by an asterisk.

statements by the nuclear-weapon States on their voluntary commitments to implement relevant provisions of the Model Protocol on a legally binding basis and, in particular, President Clinton's message and the announcement by the United States that it intended to apply all the measures in the Model Protocol except those relating to national security. It was to be hoped that the other nuclear-weapon States would follow suit.

53. She had also noted with interest the statement by India, a country with an INFCIRC/66-type agreement, indicating its security concerns and describing the prospects for possible negotiation of a more comprehensive safeguards agreement once those concerns had been met. It was to be hoped that such an agreement could be concluded in the near future. Although the security concerns in some regions of the world were understandable, universal application of the strengthened safeguards system was essential in order for it to be credible, effective and in line with the goals of non-proliferation. She was therefore concerned about the statements made by other countries with INFCIRC/66-type agreements

54. With those comments, she endorsed the recommended action contained in paragraph 15 of document GOV/2914 and associated herself with previous speakers in requesting the Director General to report periodically to the Board on developments in connection with the implementation of the new safeguards system.

55. Mr. ORTIZ (Spain)*, having associated himself with the comments made by the Governor from the Netherlands on behalf of the European Union, said it appeared from the statements of the nuclear-weapon States that some of them were interpreting paragraph 3 of the Foreword to the Model Protocol in an excessively restrictive manner. At the same time, he thanked the United States for the sensitivity that it had shown from the very beginning of the exercise to the legitimate concern of many of the non-nuclear-weapon States regarding the need for universal application of the proposed measures.

56. Mr. HERRERA ANDRADE (Mexico)* joined others in commending the Chairman, the Secretariat and the Director General on their efforts in bringing the work on Programme 93+2 to fruition. He also thanked the nuclear-weapon States for the

statements they had made, which had facilitated progress. The final goal was nuclear disarmament and concomitant regional and international security. Although the Protocol would enhance security, there could not be complete security without full nuclear disarmament and he therefore hoped that the nuclear-weapon States would adopt appropriate measures to eliminate the nuclear threat.

57. Mr. PAPADIMITROPOULOS (Greece)* endorsed the statement which had been made by the Governor from the Netherlands on behalf of the European Union. He also thanked the Chairman and his predecessor, Ambassador van Ebbenhorst Tengbergen, for the considerable efforts they had made, the Secretariat for the valuable assistance it had provided, and the Director General for exerting his influence to bring the process to a successful conclusion.

58. Safeguards was a highly political issue and it had been the Committee's task to formulate rules which would allow the Secretariat to fulfil its obligations under the NPT. The best way of doing that was to modernize the safeguards system and develop additional measures which would enable the Agency to detect undeclared activities. Greece was convinced that the NPT, strengthened by safeguards agreements and the Protocol, would help stem proliferation and encourage continued progress towards disarmament, leading to an enhancement of international security and of the conditions for the implementation of the peaceful uses of nuclear energy. However, universality of the safeguards system was essential if all States were to have confidence in its effectiveness and efficiency. In that connection, he had noted with great satisfaction the statements which had been made by the nuclear-weapon States indicating their willingness to adopt the measures in the Protocol.

59. In conclusion, he requested the Director General to keep the Board informed of the conclusion of individual protocols and of progress with the implementation of the new safeguards system.

60. Ms. HASAN (Pakistan)* associated herself with the statement which had been made by the Indian delegation to the effect that the Protocol was only relevant to States with comprehensive safeguards agreements. Paragraph 4 of the Foreword to the Protocol was therefore out of place and should be deleted.

61. Mr. OURO-PRETO (Brazil), after congratulating the Chairman and his predecessor on their able work in chairing the Committee and having thanked the Secretariat for its highly professional assistance, said that his Government had always attached great importance to strengthening the effectiveness of the safeguards system and had thus played an active part in the work of Committee 24. The Model Protocol had been greatly improved during the negotiations and he welcomed in particular the final version of Article 4 and especially the provisions relating to complementary access to non-nuclear installations. He also welcomed the special attention which had been given to the issue of *confidentiality*.

62. Safeguards should be as universal as possible and expanded safeguards only made sense if all States accepted them. He had therefore noted with interest the statements of the nuclear-weapon States indicating their intention to negotiate special agreements. He particularly welcomed the declaration of the United States delegation. It was to be hoped that other States with non-comprehensive safeguards agreements would also participate in the new measures.

63. Finally, having reiterated the point made by the delegation of Argentina that the new safeguards system would have to take into account ABACC in the new agreement with Brazil and Argentina, he endorsed the recommendations contained in paragraph 15 of document GOV/2914.

64. Mr. ARROUCHI (Morocco)*, having thanked the Chairman, the Director General and the Secretariat for their manifold efforts during the work of Committee 24, noted that substantial progress had been made in recent years towards eliminating weapons

of mass destruction, including nuclear weapons. Nuclear-weapon-free zones had been established in Latin America, the South Pacific and Africa, and he hoped that one would soon be established in the Middle East as well. It was essential that the safeguards system should inspire confidence and its universality was the only way to ensure the effectiveness of the non-proliferation regime. While he had noted the statements of the nuclear-weapon States indicating the measures they intended to accept, he continued to believe that the measures in the Protocol constituted an indivisible whole and should not therefore be adopted on a selective basis.

65. With those comments, he supported the recommendations contained in paragraph 15 of the document.

66. The CHAIRMAN, there being no more speakers, took it that the Board:

(a) Took note of the report of the Committee on Strengthening the Effectiveness and Improving the Efficiency of the Safeguards System to the Board contained in document GOV/2914;

(b) Endorsed the understandings reached in the Committee, which were set forth Attachments 2 and 3 to its report, on the relationship between additional protocols and the respective safeguards agreements;

(c) Having taken note of the statements made under item 3 by States with non-comprehensive safeguards agreements, approved the draft Model Protocol contained in Attachment 1 to the Committee's report;

(d) Requested the Director General to proceed as set forth in the Foreword to the Model Protocol and to keep the Board regularly informed of the conclusion and entry into force of individual protocols;

(e) Agreed to set up open-ended ad hoc working groups to advise it whenever amendments were proposed to the lists contained in Annexes I and II, and confirmed that those working groups would follow the established practice of the Board in arriving at their decision; and

(f) Requested the Director General to review periodically and update the regime for the protection of confidential information and to keep the Board periodically informed on the implementation of that regime.

67. It was so decided.

68. Mr. RITCH (United States of America) said that he felt sure the Chairman would agree with him that a great debt of gratitude was also owed to his predecessor who had adroitly and successfully steered Programme 93+2 through some of its more difficult phases. He also applauded the work of Mr. Pellaud, the Deputy Director General for Safeguards, who had coined the name for the Programme and had seen it through from its inception in 1993. He was glad that the Programme had finally come to fruition, since its name was becoming an embarrassment. Finally, he thanked Mr. Hooper, the Director of the Division of Concepts and Planning, for his enormous contribution.

69. The DIRECTOR GENERAL, having expressed his great satisfaction at the adoption of the Model Protocol, which was an historic moment, recalled that after the Gulf War it had become clear that the world needed a safeguards system with a greater detection capacity. The Agency's initial approach had been incremental based on the adoption of measures which it could perform within its existing legal authority and a great deal had been achieved using that approach. The Programme 93+2 concept developed in the Department of Safeguards, on the other hand, had been a systematic approach founded on the experience gained, inter alia, through the inspections in Iraq. Those parts of the Programme which it had been possible to initiate on the basis of existing authority had been implemented without losing any time, but it had been recognized that the remaining parts required a new basis of authority for their implementation; that new basis had now been achieved. Though the process had sometimes seemed long and arduous, it had in fact been relatively swift, and everyone involved had worked very intensively. The draft proposals which had been developed within the Secretariat had been adapted to respond to Governments' concerns about intrusiveness, the rights of private citizens and

confidentiality. It was gratifying that Governments were now ready to launch themselves into a strengthened and more demanding verification system.

70. He did not wish to suggest that the system had a 100% detection capacity; such an approach would be prohibitively expensive and hardly attainable. However, the detection and deterrent capacity could be expected to increase considerably once the system was in full operation. In a world freed, or nearly freed of nuclear weapons, there would be a need to go even further, but the new system had to be applied first. With positive experience, the level of confidence in the Agency's verification activities should rise and as confidence in the reliability of international verification grew, less need would be felt for national and regional verification. The adoption of the Model Protocol was not the end of the road, but it was a great leap forward towards greater efficiency.

71. He welcomed with pleasure the duties placed upon the Director General and the Secretariat as a result of the Board's adoption of the Model Protocol: letters would be prepared to Governments with comprehensive agreements proposing talks on the acceptance of the Model Protocol; meetings would be held with other Governments in order to discuss what measures they were ready to take; reports would be presented to the Board on acceptance of the Protocol; and preparations for implementation would continue. He hoped that Governments would move swiftly in accepting and signing additional protocols so that he would be able to report positively to the session of the General Conference in September commemorating the Agency's fortieth anniversary. It was important not to lose the momentum which had been gained.

72. In conclusion, he thanked the Chairman for skilfully piloting the Protocol through to its adoption, and the members of the Board and Government experts from both in and outside the Board - in particular in SAGSI - for the tremendous work they had done. Finally, he thanked the staff of the Secretariat in the Department of Safeguards, the Division of External Relations and the Legal Division, as well as his own office, for their excellent work.

73. The CHAIRMAN thanked all the members of the Committee, the Board and other delegations who had contributed to the work. In particular, the consultations and discussions which had been held outside the meetings had been indispensable. He also thanked the Secretariat - especially the members of the "Core Group"[1] - who had been of enormous assistance to him. Finally, he thanked the staff of Conference Services and the interpreters and translators for their untiring efforts. He himself had found it exciting and stimulating to be part of the exercise.

The meeting rose at 4.45 p.m.

[1] See GOV/COM.24/OR.55 para. 48.