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THE INTERNATIONAL ATOMIC ENERGY
AGENCY: APPLICATION OF SAFEGUARDS
IN THE UNITED STATES

AN ANALYSIS OF THE AGREEMENT AND AN
ASSESSMENT OF THE NEGOTIATION

PREPARED FOR THE

COMMITTEE ON FOREIGN RELATIONS
UNITED STATES SENATE

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FOREWORD

Last year, President Carter submitted to the Senate an agreement with the International Atomic Energy Agency (IAEA) for application of international safeguards in the United States and asked that the Senate consent to ratification of the agreement as a treaty.

The proposed treaty raises a number of questions which will be explored carefully during hearings by the Committee on Foreign Relations. The treaty could have important non-proliferation benefits by demonstrating our willingness to accept the same international safeguards and controls accepted by non-nuclear weapons states under the Non-Proliferation Treaty and required under the Nuclear Non-Proliferation Act of 1978 of countries cooperating with us. These benefits must be weighed against the obligations, responsibilities and costs entailed. We will want to make certain that the treaty would be applied to domestic nuclear energy activities in a realistic and practical manner. We must also ensure that sensitive national security information and commercially valuable data would not be jeopardized as we open our peaceful activities to international inspection.

Accordingly, it will be necessary to examine carefully the executive branch's plans for implementing and administering the treaty and to ascertain the likely frequency, coverage, and scope of the inspections program in general and as it would be applied in regard to certain key installations, such as the Portsmouth centrifuge enrichment facility.

In preparation for Committee consideration of this complex treaty, I asked the Congressional Research Service of the Library of Congress to provide two analyses for the Committee's use.

The first analysis, prepared by Dr. Warren H. Donnelly, describes the agreement and its purposes and discusses the potential effects of the agreement, effects within the United States, and potential issues.

The second paper was prepared by Mr. Allan M. Labowitz, who was directly involved in the negotiations while serving as counselor to the United States mission to the IAEA in Vienna. Mr. Labowitz's paper identifies key issues in the negotiations and the actions and goals of the United States and other interested countries which led to the agreement.

I expect that the Committee will be holding hearings on the treaty at an early date.

I hope the efforts of Dr. Donnelly and Mr. Labowitz will prove valuable to Members of the Committee and others concerned with this important matter.

FRANK CHURCH, *Chairman,*
Committee on Foreign Relations.

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PART 1.

THE U.S./IAEA SAFEGUARDS AGREEMENT

PURPOSE OF THE ANALYSIS

This analysis provides information on the safeguards agreement between the United States and the International Atomic Energy Agency (IAEA), which is pending before the Senate as a treaty. It explains what the agreement is and why it was negotiated, sketches its history, and compares it with similar agreements between the IAEA and non-nuclear-weapons countries that have ratified the Non-Proliferation Treaty (NPT), identifying and discussing notable differences. It speculates on the agreement's potential effects and identifies possible issues.

The analysis is based upon a side-by-side comparison of the proposed U.S. agreement with the IAEA standard agreement for non-nuclear-weapons countries as it appears in the Agency's information circular 153. The discussion of potential effects and identification of potentially controversial matters is based upon the author's experience with non-proliferation matters at the Congressional Research Service since 1974.

PURPOSE OF THE SAFEGUARDS AGREEMENT

In transmitting the safeguards agreement to the Senate, on February 9, 1978, for its advice and consent, the President said that in submitting itself to the same safeguards as other NPT nations, the United States' intention was to demonstrate that adherence to the NPT does not place other countries at a commercial disadvantage (in nuclear energy) because of increased costs associated with safeguards or risk of exposure (theft) of proprietary information. In addition, the President expects that U.S. ratification will encourage other nuclear countries to adhere to the NPT and help improve IAEA safeguards.

The President also noted that ratification would carry out President Johnson's pledge in 1967, made when negotiations for the Non-Proliferation Treaty (NPT) were completed, to permit application of IAEA safeguards to U.S. nuclear facilities without national security significance.

Not mentioned by the President is a popular restatement of the purpose of the agreement: to share the misery as well as the benefits of safeguards, because effective safeguards are likely to be of some nuisance to the operator of a nuclear facility that is subject to inspection because he has to provide special information.

DESCRIPTION OF THE SAFEGUARDS AGREEMENT

The agreement consists of two documents: the agreement proper for application of IAEA safeguards to nuclear facilities to be selected by the Agency from a list to be provided by the United States; and a protocol for the United States to supply information and reports to the Agency for other nuclear facilities on the list that are not selected for full safeguards. This second category can be thought of as facilities in standby status for future full inspection.

SUBSTANCE OF AGREEMENT

The proposed safeguards agreement is an adaptation of the standard safeguards agreement between the Agency and a non-nuclear-weapons state that has ratified the NPT and so has agreed to accept the Agency's safeguards for all peaceful nuclear activities within its territories and under its control. The U.S. safeguards agreement seeks to adapt this standard agreement to the circumstances of a nuclear-weapons state which has so many nuclear installations that the Agency could not safeguard them all. The agreement suggests that the negotiators tried to preserve as much as possible of the standard safeguards agreement so as to minimize any charge that the U.S. nuclear industry would be subject to less onerous requirements than nuclear industries in NPT states.

In substance, the U.S. agreement differs from the standard agreement in two principal ways. First, IAEA safeguards will not apply to facilities or materials involved in the U.S. military use of nuclear energy, including weapons and, presumably, nuclear propulsion. Second, to keep the safeguards effort within bounds of the Agency's safeguards resources, only a few U.S. nuclear facilities will be safeguarded at any one time, with the United States to provide information about others. The Agency will have the sole right to select U.S. nuclear facilities for full safeguards or standby safeguards status from a list to be provided and kept current by the United States.

FORM OF THE AGREEMENT

The document consists of the safeguards agreement and a protocol. The agreement itself consists of two parts. The 26 articles of Part I set out United States and IAEA commitments; the 64 articles of Part II deal with details and procedures. The separate protocol consists of 28 articles.

NOTABLE PROVISIONS

The basic commitments of the United States and the Agency appear in Part I of the Agreement. Of the 26 articles, 11 impose commitments and obligations upon the United States, and 11 upon the Agency, while 6 impose conditions jointly upon the United States and the Agency.

The salient provisions of Part I of the Agreement, as shown in Table II, commit the United States to: permit the Agency to apply safeguards; list for the Agency facilities from which it may select those to be safeguarded and those to be in standby status; maintain a national system of accounting and control for safeguarded nuclear

materials; provide the Agency with information and data; and ensure that Agency inspectors can function. The Agency for its part is to: select facilities to be safeguarded or to be in standby safeguards status; apply safeguards with minimum interference; protect commercial and industrial secrets and confidential information; and supply inspectors acceptable to the United States. Under the Agreement, U.S. nuclear facilities would fall into four categories; those not listed by the United States because of national security, those selected for safeguards, those selected for standby, and those not selected at all. It is expected that perhaps six to 10 facilities would be safeguarded at any one time, and that ultimately all of the listed but safeguarded facilities would be in standby status.

Part II of the Agreement sets out in 64 articles the details and procedures supportive of the Part I commitments. Notable among these are the statements of safeguards objectives in Articles 28-30 and the requirement for the U.S. national system. The objective of the safeguards, as specified in Article 28, is the timely detection of unauthorized withdrawals of significant quantities of safeguarded materials from activities in listed U.S. facilities. In comparison, the objective of the standard IAEA safeguards agreements is the timely detection of diversions of significant quantities of nuclear material from peaceful nuclear activities to the manufacture of nuclear weapons or of other nuclear explosive devices or for purposes unknown, and deterrence of such diversion by the risk of early detection.¹

NOTABLE DIFFERENCES FROM THE STANDARD AGREEMENT

The United States and Agency negotiators sought to adapt the standard IAEA safeguards agreement for non-nuclear-weapons states, most of which have comparatively few nuclear installations, to the circumstances of the United States which is a nuclear-weapons state with many nuclear facilities. The resulting agreement would apply IAEA safeguards in the United States in the same way they are applied elsewhere so that U.S. nuclear activities would not have a special advantage over other countries and would also share equitably in the nuisance of safeguards. Modifications in the standard agreement were necessary. Part I of the U.S. agreement has 11 notable differences between it and the standard agreement; Part II has nine notable differences. Table I of Appendix II cross references the articles in the U.S. agreement with those of the standard IAEA agreement and indicates those where there are notable differences. There are also differences between the U.S. agreement proper and the protocol with its provisions to require information about materials in facilities in standby status. Further identification and discussion of these differences appear in Appendices III and IV.

COMMENTARY IN THE PRESIDENT'S MESSAGE

The President's message of February 9, 1978, which transmitted the agreement to the Senate, briefly summarized its purpose, drew attention to President Johnson's voluntary offer of 1967, referred to

¹ INFCIRC/153, Article 28.

an enclosed report of the State Department on the agreement, and concluded with the following statement:

Universal participation in the NPT is a central goal of our nonproliferation policy. The entry into force of this agreement would encourage that participation and would fulfill our long-standing commitment to accept safeguards. I urge the Senate to act favorably on this agreement at an early date and give its advice and consent to ratification.

The Department of State's report gave some background on the agreement and then briefly mentioned 11 of the 26 articles in Part I, and 13 of the 64 articles in Part II.

The State Department noted that the United States by submitting itself to the same safeguards as other states, can demonstrate that adherence to the NPT does not place other countries at a commercial disadvantage either because of the increased costs associated with safeguards or because of risks of exposure of proprietary information. The voluntary offer was described as having been an incentive to the Federal Republic of Germany and Japan to ratify the NPT and thereby to place their nuclear materials under IAEA safeguards, which both have done. In addition to encouraging adherence to the NPT, the State Department hopes that the offer will help to improve Agency safeguards as Agency inspectors and U.S. personnel combine their experience and collaborate in making the safeguards systems more efficient and effective.

The Department of State concluded by noting that it, the Arms Control and Disarmament Agency, and the former Atomic Energy Commission were primarily responsible for negotiation of the agreement. Preparations for its entry into force has been undertaken by an inter-agency group with representatives of the Department of State, ACDA, NRC, DOE, and to a lesser extent, the Department of Defense. According to the State Department, the agreement has the approval of all these named departments and agencies. The President's submittal, however, does not provide any of this advice. Nor do the President's submission or the State Department's report indicate any views or advice of the National Security Council.

POTENTIAL EFFECTS OF THE AGREEMENT

Ratification of the agreement as a treaty would symbolize U.S. support of the NPT and of IAEA safeguards, but would be unlikely to influence a non-nuclear-weapons state that wants to acquire nuclear weapons. Nor would it cause non-NPT states to ratify the NPT. The following effects can be seasonably anticipated.

REDEMPTION OF THE U.S. OFFER

More than a decade has passed since President Johnson volunteered to place many U.S. nuclear materials and facilities under safeguards. The long delay since then apparently was tied to U.S. efforts to get Euratom to negotiate a safeguards agreement with the Agency, and to get Japan to ratify the NPT. Now that these steps have been taken, it is arguably time to redeem the voluntary offer the United States made so long ago in support of the NPT.

FRESH SUPPORT FOR THE NPT

Carrying out the agreement could provide new additional support for the commitments and principles of the NPT. Failure to carry out the agreement probably would weaken support for the NPT.

IMPROVEMENT OF IAEA SAFEGUARDS

Carrying out the agreement could upgrade IAEA safeguards by providing advanced professional training and experience for its inspectors and by acquainting them with the latest improvements in safeguards systems and technology from U.S. research and development. In particular, IAEA personnel would have opportunities to inspect advanced facilities, especially fuel fabrication plants and other facilities where nuclear materials are handled in bulk. The continued development and use of advanced safeguards technology in U.S. facilities also could give the inspectors valuable experience and probably would help to create pressure for other countries to adopt these advanced improvements.

U.S. EVALUATION OF IAEA SAFEGUARDS

The performance of the Agency's inspectors in the United States would give firsthand insight into their competence and, by inference, into the effectiveness of IAEA safeguards. This experience could help to demonstrate the credibility of the Agency's system and of information fed into it from national safeguards systems.

MEETING ARGUMENTS AGAINST DISCRIMINATION

Effective carrying out of the agreement could tend to meet the complaint by some countries of discriminatory provisions in the NPT. The United States, by subjecting itself to the safeguards applied in NPT non-nuclear-weapons states, could reduce or eliminate the complaint of NPT discrimination between weapons and non-weapons states.

DIVERSION OF SCARCE IAEA RESOURCES

The IAEA has a limited number of inspectors and inventory of equipment for world safeguards. To assign even a small part of this scarce resource to the United States for cosmetic reasons of appearance would tend to reduce IAEA capacity to provide safeguards coverage in other nations where they may be more needed to help deter proliferation.

DOUBTS ABOUT IAEA USE OF U.S. INFORMATION

The agreement would generate a vast flow to the Agency of information on nuclear materials in the United States, with little indication of what the Agency plans to do with it or its ability to handle it. This flow might overwhelm the Agency's system for processing accountability information from non-nuclear-weapons states.

DOUBTS ABOUT NATIONAL SAFEGUARDS SYSTEMS

While carrying out the agreement might enable the Agency's inspectors to verify that there had been no unauthorized withdrawal of U.S. materials at inspected facilities, the Agency would not be able to verify whether or not there had been unauthorized withdrawal at uninspected facilities. Also, the agreement does not authorize the Agency to set standards for the U.S. safeguards systems to demonstrate that this can be done acceptably.

DIMINISHING RETURNS

After a few years, other nations are likely to lose interest in IAEA safeguards within the United States. Thereafter, the expense of Agency safeguards in the United States to the Agency and to the United States would continue but with a diminishing benefit in return.

EFFECTS WITHIN THE UNITED STATES

Within the United States, carrying out the agreement probably would affect several Federal agencies, the U.S. nuclear supply industry, and the U.S. nuclear power industry. It would have imperceptible effects upon the public.

THE DEPARTMENT OF STATE

Since the agreement would be administered as a treaty, the Department of State would have a continuing involvement, particularly in case of disputes and difficulties. Considering the major new responsibilities of the State Department under the Nuclear Non-Proliferation Act, there may be some question of its present ability to take on this additional work.

THE ARMS CONTROL AND DISARMAMENT AGENCY

While ACDA has participated directly in negotiating the agreement, and while it can be expected to be interested in monitoring the carrying out of the agreement and assessing its effects, the ACDA would have little day-to-day involvement. Note, however, ACDA has a vigorous program to improve safeguards systems.

DEPARTMENT OF ENERGY

The President's transmittal and the Department of State report on the agreement imply that some DOE nuclear facilities would be on the list of eligible facilities. Presumably, these would include various DOE test reactors, particularly those fueled with highly enriched uranium or plutonium, such as the Fast Flux Test Reactor, the projected national nuclear waste facility, and possibly the planned expansion of U.S. enrichment capacity. The DOE's Oak Ridge National Laboratory, because of previous work, probably would receive nuclear materials accounting information to be sent to the Agency and presumably put it into a form compatible with the Agency's computer system. The over-

all effect on DOE would be to require time and effort to arrange access to facilities, continue present technical support programs for the Agency's safeguards, and in other ways to help prepare both DOE facilities for international safeguards.

THE NUCLEAR REGULATORY COMMISSION

The NRC's work would be somewhat increased by the agreement. NRC would have to revise its regulations to require its licensees to provide the design and accounting information for the Agency, and to provide for IAEA inspection. The NRC, rather than the DOE or the DOS, has the sole authority to require its licensees to cooperate with the Agency, to permit inspection, and to supply information. While the number of licensed facilities to be inspected probably would not be more than 6 to 10 at any one time, it is expected that the Agency would change its selections from time to time, which would mean that the NRC would have to do what was needed to make the changes and to make IAEA safeguards work, sometimes with complications from disinterested or even hostile licensees.

THE NUCLEAR SUPPLY INDUSTRY

The Agency is likely to choose commercial fuel converters, fuel fabricators or other bulk handlers of nuclear materials for safeguarding. These licensees can be affected by requests to supply design and accounting information; to permit inspection and to produce things to be inspected; to take and analyze samples;² to observe sampling by others; and to permit installation of IAEA equipment. U.S. licensees face possible requests to provide some containment measures to reduce access to sensitive nuclear materials and to permit installation of surveillance equipment. Licensees also may have human relations problems in dealing with IAEA inspectors who may not be accustomed to U.S. life styles and who may be naive in their understanding of the processes to be safeguarded. These licensees may also have some misgivings about protection of company confidential information which the inspectors will need for their work. Note that one argument for the agreement is its demonstration that this is not a serious risk. The nuclear industry may benefit from IAEA inspection to the extent that it confirms the reliability of the U.S. national safeguards system.

THE NUCLEAR POWER INDUSTRY

The licensees for nuclear power plants selected for inspection likewise will feel the effects of IAEA inspection and the presence of inspectors at critical operations, such as initial loading and reloading of cores. Sooner or later, the Agency is likely to ask for some kind of verification of the amount of plutonium estimated to be in spent fuel discharged from nuclear power plants. At present, despite years of work by the Agency and others, there is no nondestructive testing method or equipment in commercial use for this purpose.

² Note, however, that in most instances the IAEA cannot require a licensee to take and analyze samples, and if this is done, the Agency pays the cost, to observe sampling by others; and to permit installation of IAEA equipment.

ISSUES LIKELY TO BE RAISED

The Administration appears confident that the benefits to the United States from the voluntary agreement, in terms of helping to reduce the risks of spread of nuclear weapons associated with nuclear power, would be great enough to assure the consent of the Senate. Nonetheless, there are many questions about the treaty and its effects which can be expected to appear as Congress inquires into it. There follows a list of questions that appear likely to be raised.

THE NEED FOR THE TREATY

If placing U.S. nuclear facilities under IAEA safeguards was not necessary from 1967 to date, why is it necessary or desirable now?

Why has it taken from 1967 to 1978 for the United States to complete its negotiations with the IAEA and to submit the agreement for ratification?

TREATY STATUS

The President presented the safeguards agreement to the Senate for ratification as a Treaty. In comparison, all other U.S. agreements for nuclear cooperation have been submitted to both Houses of Congress as executive agreements. As a treaty, the safeguards agreement would be part of the supreme law of the land although it could be changed by legislation. An executive agreement for cooperation can be easily changed at any time Congress so desires. Since the negotiators apparently negotiated a safeguards *agreement* with the Agency, why did the President present it as a *treaty*? Also, if this agreement is given treaty status, what would be the reasons for and against transforming U.S. agreements for cooperation into treaties? In particular, to what extent would such a change increase the credibility of the United States as a nuclear supplier?

ADMINISTRATION

What are the respective responsibilities of the Department of State, the Department of Energy, the Nuclear Regulatory Commission and the Arms Control and Disarmament Agency in carrying out the agreement? What coordination will there be of these Federal responsibilities?

How soon will the treaty take effect after Senate approval?

What have the responsible agencies done to prepare themselves to carry out the treaty?

What has been done to inform the operators of nuclear facilities of information they may have to collect and supply, and access they will have to provide?

COSTS OF COMPLIANCE

It seems likely that compliance with the Agency's requirements for batch accounting, the establishment of material balance areas and reporting of material balances for such areas, the submission of special reports, plus the costs of inspections and associated sampling and analyses required by the Agency, all will generate costs. The Admin-

istration's presentation to Congress did not indicate what these costs may be, who will bear them, and what effect they will have on costs of nuclear energy.

FACILITIES TO BE INSPECTED

Presumably, all NRC licensed facilities will be on the list from which IAEA will select those to be inspected. In addition to these, what unlicensed DOE facilities are likely to be on the list? In particular, is it contemplated that the new U.S. enrichment facility at Portsmouth will be on this list? Will any of the three DOE enrichment plants be on the list to give the Agency working experience with safeguarding a large-scale enrichment facility? To what extent would such experience increase the effectiveness of IAEA inspections of the Urenco and Eurodif enrichment plants in Europe?

INFORMATION REQUIREMENTS

The U.S. agreement contemplates that design and accounting information will be supplied to the Agency. How will this be done? Which agencies will be responsible? Will accounting information be sent in raw form or will it be processed by the United States? If the latter, who will do this? How much will it cost? Also, how compatible will be the information now collected by the United States for its domestic purposes with the form specified by the Agency? If there are incompatibilities, how serious will they be and how close to resolution are they?

What are the respective roles of the DOE and NRC in collecting, processing and supplying information to the Agency?

To what extent will operators of licensed or contractor facilities have to supply information directly to the Agency or its inspectors?

What does the Agency plan to do with the routine nuclear materials information to be supplied to it? The Agency presumably is developing a sophisticated data processing system for such information. Will it have the capacity to receive and handle the large amount of information to be expected from the United States?

INSPECTIONS

The agreement provides for three kinds of IAEA inspections: ad hoc, routine and special. These vary in purpose, notice and frequency. How will the regulations governing these inspections distinguish them? What costs are they likely to cause? Who will bear these costs? For those costs that the Agency is to bear, will the U.S. facility collect from the Federal Government which, in turn, collects from the Agency, or would the inspected facility deal directly with the Agency?

Will IAEA inspectors always be accompanied by U.S. officials or can IAEA inspectors demand entry and access by themselves?

Does the Agency expect to establish continuous inspection at certain U.S. facilities, such as at those that handle nuclear materials in bulk?

What access will IAEA inspectors be given to the privately owned Barnwell fuel reprocessing facility in view of its inoperable status?

How will surprise inspections be arranged? Will the IAEA have to arrange them through the NRC, or will it deal directly with the facilities?

Can IAEA inspectors export samples of nuclear materials without an NRC license?

IAEA SAFEGUARDS

A collateral purpose of the agreement would be to help improve the effectiveness of IAEA safeguards. This purpose, however, can be expected to raise questions including the following:

1. Doubts about safeguards. Some analysts question the effectiveness of international safeguards. For example, the Acheson-Lilienthal report on the international control of atomic energy in 1946 stated:

We have concluded unanimously that there is no prospect of security against atomic warfare in a system of international agreements to outlaw such weapons, controlled only by a system which relies on inspection and similar policy-like methods * * *. A system of inspection superimposed on an otherwise uncontrolled exploitation of atomic energy by national governments will not be an adequate safeguard.

More recently, a key NRC safeguards official resigned after refusing to declare IAEA safeguards reliable. On the other hand, others see IAEA safeguards as adequate for their intended purposes. What is the Administration's analysis of these doubts and the reasons for them?

2. Why are improvements still needed? In September 1977, the Agency's Director General told the IAEA general conference that intensive development will be essential to make safeguards both more credible and cost effective. More needs to be done, he said, to improve safeguards in continuously fueled power reactors (the Canadian type) and fuel fabrication plants. Considering that the end of the fourth decade of the nuclear age is drawing near, why does safeguards technology still need so much improvement? Why are safeguards deficient despite research and development in the United States and abroad over many years?

3. Containment and surveillance features. The primary tools of safeguards are accounting, containment and surveillance for nuclear materials. The agreement is specific about accounting and inspection requirements but gives little detail about containment or surveillance. Why is this? To what extent can U.S. nuclear facility operators anticipate IAEA requests to install containment features or surveillance devices such as seals and cameras?

4. Differing objectives. The statements of objectives for safeguards for the U.S./IAEA agreement and the standard IAEA agreement are different. For the U.S. agreement, the stated objective is to permit the Agency to verify whether or not an unauthorized *withdrawal* has occurred. For the standard agreement, the stated objective is to establish whether or not a *diversion* has occurred. Since "withdrawal" and "diversion" have different meanings, it may be asked what the negotiators had in mind when they made this change, and how this change might be perceived by leading non-nuclear-weapon states? Are they likely to argue that this difference would impose a signifi-

cantly less onerous burden upon U.S. nuclear facility operators than upon their own operators?

5. Effects on national systems. A recent internal IAEA report on its safeguards identified the need for significant and continuous improvement in the nuclear materials accounting systems of member states. While this report has not been officially released, it is widely referred to within the nuclear community, and bootleg copies are circulating. It may be asked how the U.S. national nuclear materials accounting systems—that for licensed holders of nuclear materials, which is administered by the NRC, and that for contractor holders of nuclear materials, which is administered by the DOE—compare with the Agency's ideal for a national system. If there are notable differences, would the United States be expected to correct them? If so, what would this mean to licensed holders of nuclear materials in terms of cost and effort?

6. Secrecy of information. The U.S. agreement provides for the Agency to keep secret information that it gets from the United States. However, there have been criticisms of excessive secrecy by the Agency, and suspicions that the Agency uses this secrecy to hide mistakes and internal controversies. Since secrecy is required also by the international statute that established the Agency—which the United States helped to draft—what would be the effect were the United States to publish voluntarily all or some of the inspection reports to demonstrate that this can be done without unacceptable risk to commercial secrets and information? To what extent would U.S. laws that protect commercial information from Government disclosure limit Federal agencies from publishing or making available the results of IAEA safeguards inspections? Would this information be available under the Freedom of Information Act?

7. Unanswered questions. In May 1977, the Agency's then-top safeguards official, Rudolph Rometsch, said at an IAEA symposium that safeguards verification leaves many questions unanswered. Elaborating, he said:

* * * Insufficient experience is available for judging how the findings of the SSAC [national safeguards system] verification activity can be used effectively for the Agency to arrive at independent conclusions on the non-diversion of nuclear material. Until such experience can be gained, it will be necessary for the Agency and the SSAC to carry out jointly a continuous inspection program and thereby learn how the duplication of safeguards effort can be minimized.

What are the implications of this comment for the U.S. agreement? Can the Agency's prospective experience with the U.S. national safeguards system help? Would this experience be regarded by other states as valid?

SPENT FUEL

In light of the President's policy for indefinite storage of spent fuel without reprocessing and his proposals for the construction of a Federal spent fuel repository, the plutonium contained in spent fuel will become an increasingly large figure in the U.S. nuclear materials inventory. Will this plutonium be under IAEA safeguards? If so, what

methods and equipment are available to measure and verify the plutonium continued in spent fuel? How reliable and accurate are the measurements? What is being done to improve reliability and accuracy?

TERMINATION

The U.S. agreement is to remain in force as long as the United States is a party to the NPT. But article 26 also contains a possible loophole. It provides for the United States and the Agency to commit themselves to consult upon request, and, to the extent mutually agreed, to modify the agreement “* * * in order to ensure that it continues to serve the purpose for which it was originally intended.” If the parties are unable to agree upon modifications, either may, upon six months’ notice, terminate the agreement. Is this a backdoor termination provision unavailable to other nations? What is the purpose of this provision?

PART 2.

ASSESSMENT OF THE NEGOTIATION

BACKGROUND AND PURPOSE OF THE OFFER BY PRESIDENT JOHNSON IN 1967

During the negotiations of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) in 1966 and 1967, one of the issues which proved most difficult to resolve was whether the Treaty should include a requirement for the application of IAEA safeguards to the peaceful nuclear activities of parties. The representatives of the United States advocated a provision in the Treaty requiring each non-nuclear weapon state party to the Treaty to submit all of its peaceful nuclear activities to IAEA safeguards. Such a requirement was seen as important to the verification of the basic undertakings by such parties. Senator John Pastore, in an important statement in the Senate, considered such a provision, making such safeguards mandatory in non-nuclear weapon states, to be essential to the purpose of the Treaty.

In the negotiations at the Eighteen-Nations Disarmament Committee (ENDC) meeting in Geneva, however, such a provision was opposed by many non-nuclear weapon states. Some maintained their traditional opposition to the principle of international inspection as an invasion of sovereignty and as a measure aimed particularly at developing countries. More novel was the objection of industrialized countries, particularly non-nuclear weapon states of the European Community and Japan, to the proposal. In consultations with its European allies, it was argued to the United States that (1) the peaceful nuclear activities of all members of the European Community were already required, by the Treaty of Rome, to be safeguarded by the multinational organization maintained for that purpose by Euratom and (2) the exclusion of the nuclear weapon states from any requirement in the NPT for application of IAEA safeguards would provide the commercial industrial activities in those states an advantage in competing with industrial activities in which IAEA safeguards are required.

The first objection was addressed by the United States in a statement of guiding principles, developed in extensive consultations with its European allies and placed on record at the ENDC. (See page 10 of Hearings before the Committee on Foreign Relations on ratification of the NPT, July 1968, for the text of those guiding principles.)

In addressing the second argument, however, the negotiators were faced with the necessity to respond to concerns that IAEA inspection would impose a serious economic burden on commercial enterprises

through interference with their efficient operation, resulting in increased operating costs, and through the compromising of industrial and trade secrets. At that time, the IAEA had acquired little experience in safeguarding commercial nuclear activities which the United States negotiators could cite in support of their conviction that such concerns were unfounded. Yet the safeguards issue had become a powerful public argument against acceptance by the NPT of a number of industrialized countries having the capability, if they undertook to do so, to manufacture nuclear weapons.

Within the Administration, arguments were made that provisions for mandatory safeguards be dropped, in the interest of completing the negotiation of the NPT and of gaining the widest possible adherence to it. The prevailing view, however, was that the Treaty offered what appeared to be the only foreseeable opportunity to extend IAEA safeguards to all the indigenous peaceful nuclear activities of non-nuclear weapon states and that mandatory safeguards provided an element of verification in the Treaty—a feature not otherwise incorporated in the text.

In an effort to break the impasse, the question was raised within the Administration of the United States volunteering to accept IAEA safeguards in its facilities generally, in order to clinch the argument that IAEA safeguards would not impose a hardship to nuclear activities having commercial importance. The United States had, some years previously, submitted voluntarily several research reactors and the Yankee Atomic Power Station to IAEA safeguards, as well as the Nuclear Fuel Services reprocessing plant while it was processing spent fuel from Yankee. But the idea of submitting all, or even a large fraction, of the peaceful nuclear activities in the United States to IAEA safeguards, particularly in the absence of similar action by the U.S.S.R., had not been seriously considered.

The Atomic Energy Commission, which had been the major proponent of mandatory IAEA safeguards for non-nuclear weapon states party to the NPT, agreed to address the suggestion, which offered a way to resolve the impasse with the European allies and Japan. The Commission recognized that the U.S.S.R. was unlikely to follow the example of the United States, but believed that the NPT, with mandatory safeguards in non-nuclear weapon states, was of sufficient importance to justify serious consideration of the suggestion. Accordingly, officers of major manufacturers and electrical utility organizations were invited to meet with the Commission and negotiators of the Treaty. The negotiating situation was explained and the views of the industry representatives sought concerning the proposal to permit the general application of IAEA safeguards in peaceful nuclear activities in the United States. The responses of the industry representatives indicated recognition that the assurance provided by the general application of IAEA safeguards, in the nuclear activities of their customer countries, was essential to the continuation and growth of their international trade. They also appreciated fully the value of the suggested voluntary action by the United States in meeting the concerns of other countries regarding the possible effect of IAEA safeguards and indicated their readiness to cooperate in implementing such actions, if it were taken.

As a result of the consultations with representatives of the nuclear industry and subsequently, with Members of the Congress, a recommendation was made to the President that the United States offer to permit the IAEA to apply its safeguards to all nuclear activities in the United States, excluding only those with national security significance. When the President had approved such action, the United Kingdom and the U.S.S.R. were informed of the intention of the United States making clear that the action was being taken in response to the expressed concerns of industrialized non-nuclear weapon states regarding commercial competition. The other two governments were encouraged to consider taking similar action, although it was understood that similar action by either was not to be a prerequisite to action by the United States.

The ceremonies scheduled at the University of Chicago in early December 1967, commemorating the 25th anniversary of the operation of the first nuclear reactor, was selected as the occasion for the announcement of the offer by President Johnson. In his televised message on December 2, he said:

* * * I want to make it clear to the world that we in the United States are not asking any country to accept safeguards that we are unwilling to accept ourselves.

So I am, today, announcing that when such safeguards are applied under the treaty, the United States will permit the International Atomic Energy Agency to apply its safeguards to all nuclear activities in the United States—excluding only those with direct national security significance.

Under this offer the Agency will be able to inspect a broad range of U.S. nuclear activities, both governmental and private, including the fuel in nuclear power reactors owned by utilities for generating electricity, and the fabrication, and chemical reprocessing of such fuel * * *.

That statement was followed by the announcement on December 4 by the United Kingdom of a similar offer with respect to its nuclear activities, excluding those having national security significance.

HEARINGS BEFORE THE SENATE FOREIGN RELATIONS COMMITTEE, JULY 1968 AND FEBRUARY 1969

When the NPT was opened for signature on July 1, 1968, it was signed on behalf of the United States and on July 9, was submitted to the Senate by President Johnson for its advice and consent to ratification. The Foreign Relations Committee began hearings the following day.¹

In his prepared statement at the opening of testimony, Secretary of State Rusk identified Article III of the Treaty, dealing with safeguards, as one of two primary concerns of the NATO allies. He referred to an impasse in the NPT negotiations concerning safeguards until the early fall of 1967, when the United States, after discussions in

¹ See Nonproliferation Treaty: Hearings before the Committee on Foreign Relations, United States Senate, on Executive H, 90th Cong. 2d sess. (1968) and part 2 (1969), cited herein as Hearings.

capitals of the allies, in the North Atlantic Council and in the European Atomic Energy Community (Euratom), proposed a revised compromise draft of Article III. The Soviet Union having agreed to the compromise text at the same time the three guiding principles which had been developed during the consultations with the allies.

Secretary Rusk's statement was followed by that of Mr. William C. Foster, Director of the Arms Control and Disarmament Agency who, in discussing Article III of the NPT, referred to the fact that the NPT does not require safeguards on the peaceful nuclear activities of nuclear weapon states, that this situation was noted by many governments at the ENDC, in the United Nations and in the consultations in the North Atlantic Council, but that it had been impossible to negotiate such arrangements within the NPT. "Therefore," he said, "and to remove the grounds for claim that safeguards would unfairly place industrial, economic or other burdens" on non-nuclear weapon states party to the NPT, President Johnson had made the announcement of December 2, 1967.

The statement of Dr. Seaborg, Chairman of the Atomic Energy Commission, presented on July 12, 1968, referred to concerns expressed by several countries during the negotiations of the NPT that the application of IAEA safeguards might serve to place the non-nuclear weapon states at a commercial disadvantage by compromising their commercial secrets or by interfering with the operation of the facilities involved. He noted that those fears were felt to be groundless, since Agency inspectors are precluded from interfering in plant operations, they normally require access only to information that is not commercially sensitive and, in any event, they are barred from communicating to unauthorized parties any information they receive. Referring to the President's announcement of December 2, 1967, he said, "We took this step to demonstrate the sincerity of our convictions that the safeguards to be applied under this treaty would not place the non-nuclear weapon states at any disadvantage. We also wished to demonstrate that we sought no commercial advantage through this treaty and were prepared to submit our own nuclear industry to the same safeguards as will be applied in non-nuclear weapon states."

The record of the hearings includes a memorandum submitted by the AEC at the request of the Committee staff for an explanation of the President's offer.² The memorandum notes that no date could be set, at that time, at which the offer would take effect. The progress in adherence to the Treaty and in the negotiation and implementation of IAEA's safeguards agreements with non-nuclear weapon states party to the Treaty would be considered in determining when the President's offer will take effect.

The memorandum states that the offer would be fulfilled by the negotiation of a formal implementing agreement between the IAEA and the United States Government. The agreement would identify those activities in which the IAEA could apply its safeguards and the IAEA will determine in which of those listed activities safeguards are to be applied.

The memorandum also notes that the terms of the agreement to be negotiated with the IAEA will recognize that a facility will be safe-

² Hearings, pp. 110-112.

guarded as long as the activity normally associated with it is not of direct national security significance. It goes on to state that a detailed review will be made before submitting the name of any facility to the IAEA to assure that it meets the criteria of the offer and that certain types of facilities will be excluded from the list submitted to the IAEA. The types to be *excluded* are identified as (1) military reactors, (2) plutonium production reactors, (3) space propulsion experiments, (4) auxiliary power reactors (for space applications), (5) facilities concerned at the time with military, nuclear explosive device or other classified work and (6) facilities located in an area at a site generally engaged in military, nuclear explosive device, or classified work.

An illustrative list of facilities, in six categories, which might meet the criteria of the offer and would therefore be included in the list to be provided to the IAEA is shown as an attachment to the AEC's memorandum. The six categories are: (1) central-station electric power reactors, (2) dual purpose plants (electric power and desalting), (3) experimental electric power systems (Experimental Breeder Reactor No. 2), (4) test, research and university reactors, (5) critical assembly facilities, and (6) fuel fabrication and chemical processing facilities.

The memorandum expresses doubt that the IAEA will wish to apply its safeguards to all the activities which the United States will include in the list, nor was it believed that the purpose of the offer by the United States required the Agency to do so. Rather, it was "more likely that the IAEA would elect to apply safeguards to a representative number of U.S. activities, at least initially."

In a further memorandum³ submitted by the AEC in connection with the hearings in February 1969, it was estimated that the facilities in the six categories identified in the earlier memorandum, which were then in operation, being built or planned and which might be included in the list provided to the IAEA would total about 200. The memorandum notes that the IAEA would probably choose to apply safeguards only to a small number of those listed facilities in the first five categories, but to most or all of the fuel fabrication and chemical processing facilities handling the fuel for the nuclear reactors selected.

The record of the hearings is clear that it was understood that the offer by President Johnson (which was endorsed by President Nixon when he resubmitted the NPT to the Senate on February 5, 1969) was made to provide assurance to the allies of the United States, that the Soviet Union had not given any indication that it would agree to any inspection by the IAEA of its facilities and that, as Secretary of State Rogers noted, "As a matter of fact, the Soviet Union probably would have been just as satisfied if we had not made it."⁴

SAFEGUARDS COMMITTEE OF THE IAEA, 1970-1971

The requisite states having deposited their instruments of ratification, the NPT entered into force in March 1970. The Board of Governors of the IAEA had already taken steps, at its regularly-scheduled meeting shortly before that time, to address the matter of the safeguards agreements to be concluded with each of the non-nuclear weapon

³ Hearings, p. 333.

⁴ Hearings, p. 333.

states party to the Treaty. A committee was established to advise the Board, as a first task, concerning the form and content of such agreements. Membership in the Committee was open to all members of the IAEA, which at that time numbered more than one hundred.

The Committee met first in June 1970 and met several times during the remainder of that year and in the early months of 1971, in sessions of two or three weeks. Kurt Waldheim of Austria was elected Chairman and presided for the first few sessions. A vice-chairman, Dr. Bruno Straub of the Hungarian atomic energy organization, led the Committee during its final series of meetings and was instrumental in the successful resolution of difficult issues which arose in the detailed discussions. Almost fifty countries participated in the Committee's work, which produced a report to the Board in March 1971, transmitting the text of a document titled *The Structure and Content of Agreements Between the Agency and States Required in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons*. (The document has been reproduced as an IAEA Information Circular, INFCIRC/153.)

In their participation in the work of the Safeguards Committee, the representatives of the United States and its allies sought to give effect to the three guiding principles which had been developed in the course of their consultations during the negotiations of the safeguards provisions of the NPT and which were an integral part of the negotiating history of Article III of the Treaty. Those principles regarding the safeguards and the safeguards agreements called for by Article III were:

"1. There should be safeguards for all non-nuclear weapon parties of such a nature that all parties can have confidence in their effectiveness. Therefore safeguards established by an agreement negotiated and concluded with the IAEA in accordance with the Statute of the IAEA and the Agency's safeguards system must enable the IAEA to carry out its responsibility of providing assurance that no diversion is taking place.

"2. In discharging their obligations under Article III, non-nuclear-weapon states may negotiate safeguards agreements with the IAEA individually or together with other parties; and, specifically, an agreement covering such obligations may be entered into between the IAEA and another international organization the work of which is related to the IAEA and the membership of which includes the parties concerned.

"3. In order to avoid unnecessary duplication, the IAEA should make appropriate use of existing records and safeguards, provided that under such mutually agreed arrangements the IAEA can satisfy itself that nuclear material is not diverted to nuclear weapons or other nuclear explosive devices."

INFCIRC/153 consists of 97 paragraphs (plus definitions), many of which required detailed negotiation and debate during drafting. The influence of the United States and of the United Kingdom in that process was unquestionably enhanced by the recognition by the participating non-nuclear weapon states that the safeguards procedures prescribed in the document would be applied in facilities in their respective territories.

As might be expected in any document of importance, negotiated by almost fifty governments representing a variety of views concerning an international system of inspection constituting an unprecedented intrusion on national sovereignty, INFCIRC/153 is not free of ambiguity. The most significant ambiguities appear in those paragraphs which set forth the relationship of the IAEA to the "national system of accounting for and control of nuclear material" which each non-nuclear weapon state party is called upon to establish and maintain. It was recognized that, in due course, the non-nuclear weapon states which were members of the European Community would negotiate an agreement with the IAEA, as a group, together with Euratom. None of those states had established a national system, but rather had delegated that function to Euratom, which had been applying safeguards within the Community member states for more than 10 years. Obviously, the details concerning the meshing of the multinational Euratom system with the IAEA system would require intensive negotiations. The most that could be accomplished in the Safeguards Committee was the avoidance of prejudice to the outcome of those future negotiations.

Another underlying source of tension in the Safeguards Committee was the difference in view as to the fundamental nature of the IAEA safeguards; that is, whether the IAEA's role was merely to assure that the national (or regional) system of accounting and control was being applied properly or whether the IAEA was to satisfy itself by independent means, such as inspections, measurements, analysis of samples, and the application of containment (e.g. seals) and surveillance (e.g. cameras) measures by its own inspectors that there had been no diversion of nuclear materials. Some participants, including some of the members of Euratom, advocated a procedure to be followed by IAEA of "spot checks" among the facilities in a given country, rather than a systematic sequence of inspection activities in each facility, with the actions taken and their frequency related to the character and quantity of nuclear material handled by the facility. The latter approach was followed in INFCIRC/153, thereby maintaining the fundamental premise of IAEA safeguards which the overwhelming majority of the members of the IAEA, including the United States, had supported.

The Safeguards Committee, before it completed its work on the document concerning the structure and content of the agreements, addressed the question of the financing of the Agency's safeguards activities. The less affluent countries participating in the Committee pointed out that the growth in those activities would require substantial increases in the Agency's future budgets. Since they did not foresee very much nuclear activity of their own, they resented being assessed at the normal rate to support the Agency's safeguards functions which would be required in the affluent countries. A satisfactory compromise was reached on the issue, which provided for a reduction in the assessment attributed to the Agency's safeguards activities for the less affluent members, but which preserved the principle that all member states pay a share of the costs of Agency safeguards, on the basis that those activities serve the entire world community.

During the discussions which led to that result, however, questions were raised concerning the magnitude of the costs of the IAEA

(which would be assessed upon its member governments) for its increased safeguards activities resulting from the NPT. Estimates were provided by the Secretariat of the Agency for the application of safeguards in all peaceful nuclear activities in non-nuclear weapons states during the succeeding five years. The Secretariat pointed out that similar estimates could not be made for implementing the offer by the United States and the similar offer by the United Kingdom, since the manner in which those offers were to be implemented had not been determined. It was noted, however, that the number of facilities in the United States and the United Kingdom which the Secretariat expected to be listed by those two governments pursuant to their respective offers would equal the total number of facilities in all non-nuclear weapon states. Thus, implementation of the two voluntary offers to the maximum extent would at least double the safeguards portion of the Agency's assessed budget. The reaction of the participants to this realization was predictable. The developing countries generally and the Soviet Union (which had been in the uncomfortable position of being the only nuclear-weapon state party to the NPT which had not offered to permit IAEA safeguards to be applied in any of its facilities) and its allies were not in the least enthusiastic at the prospect of their assessments being doubled in order to satisfy commercial concerns of a few affluent countries. France took the position that, since the actions by the United States and the United Kingdom were not required by the NPT, those two governments should bear the full costs of their voluntary actions. At the same time, the United States and the United Kingdom made it clear that they did not intend to bear the cost (beyond their shares, based upon the assessment rates) of fulfilling their offers, which had been made in the interest of encouraging adherence to the NPT by important countries. Thus, the question of how the offers by the United States and of the United Kingdom would be fulfilled became a center of controversy in a situation not favorable to its resolution.

DEVELOPMENT OF PRINCIPLES FOR IMPLEMENTATION OF THE OFFER BY THE UNITED STATES

When the Safeguards Committee met in February 1971, there were two issues to be addressed: arrangements for financing of the Agency's safeguard activities and, finally, its report to the Board of Governors of its recommendations.

Complex negotiations of the general approach to the financing of safeguards between two groups—the industrialized countries on one side and the less affluent on the other—were continuing, but the wide difference in view toward the specific case of financing implementation of the offers by the United States and by the United Kingdom remained unresolved.

The head of the Australian delegation, Maurice Timbs, invited the delegations of a number of industrialized countries, including Japan, the Federal Republic of Germany, Italy, Belgium, Sweden and Canada to meet with him informally, in an effort to find a way for the IAEA to implement the offers by the United States and the United Kingdom at a reasonable cost, while still achieving the purpose of the offers. The delegations of the United States and the United Kingdom

were also invited to attend Mr. Timb's informal meeting, but only as observers, in order to avoid any impression that they were seeking to limit the terms of their offers.

After his meeting, Mr. Timbs was able to report to the Safeguards Committee on the results of his efforts. He noted that some members of the IAEA had said that the offers by the United States and the United Kingdom had a significant bearing on their decisions to sign the NPT. He noted that the offers had been motivated by the wish to ensure that nuclear manufacturers in nuclear-weapon states would have no advantage over those in non-nuclear weapon states by reason of the latter states' undertaking under NPT to accept Agency safeguards on the whole of their nuclear fuel cycles. He alluded to a view which had been put forward that, if the offers were accepted by the Agency, *all* the activities made available under the offers should be inspected in the same manner and to the same extent as the Safeguards Committee had recommended for non-nuclear weapon states party to the NPT.

He reported that his delegation and those of Italy, Japan and the Federal Republic of Germany had recognized the need to keep the cost of applying safeguards in the United States and in the United Kingdom as low as possible without prejudice to the objectives. They had therefore emphasized the importance of providing for full inspection of facilities of advanced design incorporating new technology, and those which were sensitive in terms of international competition. In the interests of economy they were willing to have "random inspection" of all other nuclear activities which would be included in the offers. By that approach, the Agency's costs attributable to the offers would be reduced to less than half of those estimated by the Secretariat, on the basis of applying the full regime of safeguards to all the facilities expected to be included in the offers.

The delegate of the Soviet Union did not believe the reduction in costs was sufficient and could not assure his delegation's "support" unless the original estimates were reduced to an absolute minimum—by a factor of five or even more—by further "bargaining." The delegate of the Federal Republic of Germany made it clear that his delegation supported the proposal outlined by Mr. Timbs as a compromise solution and not for further bargaining. Unless that was understood, his delegation would withdraw its support.

No effort was made by Australia, or the other delegations which had joined in putting forward the approach, to have the Committee adopt or endorse it. Rather, it was presented as a demonstration that costs for implementing the offers could be kept at a reasonable level, while achieving their purpose, thereby avoiding the risk that the Committee would recommend either rejection of the offers or charging the costs to the United States and the United Kingdom.

Mr. Timbs' efforts succeeded in avoiding either of those alternatives and in defusing the offers as an issue in the negotiations of the general approach to the financing of the Agency's safeguards costs. Those negotiations were completed in March 1971, at which time the Safeguards Committee reached agreement on a report to the Board of Governors, transmitting the document which, after its approval by the Board of Governors in April 1971, was issued as INFCIRC/153. The Committee's report made only a passing reference to the offers by

the United States and by the United Kingdom, recommending that the Board request the Director General of the Agency to consult with those two governments as to the desirable content of the agreements to be entered into with the Agency. During the Board's discussion of the Committee's report, Mr. Timbs referred to the importance of that recommendation and expressed the hope that the Director General would also consult with the governments of the Federal Republic of Germany and Japan in connection with the desirable content of the agreements to be concluded with the United States and the United Kingdom.

The approach suggested by Mr. Timbs, with the support of Japan, Italy and the Federal Republic of Germany, for implementation of the offers, was consistent with the expectations expressed in the memoranda which the AEC had provided to the Senate Foreign Relations Committee, in that both endorsed the principle of "selectivity." The "Timbs proposal" went further by identifying the character of activities in the United States and in the United Kingdom which were of greatest concern to those countries having the greatest interest in fulfillment of the offers. The setting forth of specific criteria for facilities in which the full safeguards regime, including inspections, were to be applied—those of advanced design incorporating new technology and those which are sensitive in terms of international competition—would be very useful in the negotiation and implementation of the agreements with the Agency by the United States and the United Kingdom.

The reference in the "Timbs proposal" to "random inspection" of the remainder of the facilities to be offered was not elaborated upon by the sponsors, but its implications were not particularly helpful. No such concept had ever been adopted by the IAEA, nor had the Safeguards Committee included such a concept in its document recommending the structure and content for safeguards agreements for non-nuclear weapons states party to the NPT. It therefore appeared that the sponsors had in mind a departure from the generally accepted premise of IAEA safeguards. If that were the case, there was a risk, if the concept of "random inspection" were to be applied in the case of the United States and the United Kingdom, that an important and unhelpful precedent would be established. Clearly, that aspect of the "Timbs proposal" would require further attention in the course of the negotiation of the agreements with the IAEA by the United States and the United Kingdom.

INITIATION OF U.S. NEGOTIATIONS WITH THE IAEA

Following approval by the IAEA Board of Governors in April 1971 of the document prepared by the Safeguards Committee concerning the structure and contents of safeguards with non-nuclear weapon states (published shortly thereafter as INFCIRC/153), the governments of Finland and Austria negotiated their agreements with the Agency. The Board, during its meeting in June 1971, authorized the Director General to conclude those agreements.

The negotiation of the texts of the agreements with Finland and Austria accomplished the task of converting the requirements listed in

INFCIRC/153 into provisions of a formal agreement and thus provided a "model" for succeeding agreements with other non-nuclear weapon states party to the NPT.

The texts of those agreements were also used by the United States as a point of departure for the initial drafting of a possible agreement text in connection with the offer by the United States.

The Board of Governors, in its April 1971 meeting, had requested the Director General to consult the United States and the United Kingdom concerning the contents of the agreements to be concluded in connection with their respective offers, as had been recommended by the Safeguards Committee. Accordingly, the Director General informed the United States Representative to the IAEA that the Secretariat of the Agency was prepared to enter into discussions concerning the character of the agreement to be concluded in connection with the offer by the United States. In early June, Ambassador T. Keith Glennan replied that the United States was also ready for such discussions. His letter also noted that:

"The United States is appreciative of the continuing importance that some key non-nuclear weapon states ascribe to the U.S. offer as a mechanism for further demonstrating that the United States is not seeking a commercial advantage as a result of the NPT. Bearing in mind the financial implications and the special purpose of the offer, the United States also is aware that several states are of the view that this objective can be realized through selective application by the Agency of the concept of full inspection to certain key U.S. activities."

Ambassador Glennan's letter suggested that discussions begin in Vienna and closed with the statement that:

"The United States would expect that timing of these negotiations as well as the entry into force date of the U.S.-IAEA Agreement would be related to the timing and entry into force of the NPT Safeguards Agreements to be concluded by the Agency with a representative number of the more industrialized Non-Nuclear Weapon States."

The first formal negotiating session took place September 2, 1971, when Ambassador Glennan, accompanied by officers of the U.S. Mission to the IAEA, met with the Agency's negotiating team. At that time, a draft of a U.S.-IAEA agreement had not yet been prepared. The purpose of the United States in the discussions was to explain the approach it proposed to take in drafting the text and to obtain the views of the Agency's negotiators. The United States proposed to use the concepts of INFCIRC/153 as the basis for the U.S.-IAEA agreement to the fullest possible extent consistent with the purpose of the U.S. offer and special circumstances surrounding it. Care would have to be taken, however, that in doing so the terms of the agreement not appear to imply any modification to the offer. Conversely, the agreement should not result in any enlargement of the scope of the offer. For example, the United States had not, within the terms of its offer or the NPT, assumed any obligations with respect to its continuing possession or manufacture of nuclear weapons or other nuclear explosive devices. At the same time, the United States was interested in exploring approaches which would achieve the purposes of its offer at the minimum cost to the Agency.

The Agency negotiators suggested phasing in the submission of design information concerning U.S. facilities, in order to avoid swamping the Agency's reviewing capacity, and to limit the submission of reports to the Agency to only those from certain facilities or designated areas within facilities. (In the informal discussions which had led to the "Timbs proposal" in the Safeguards Committee, on the other hand, the sponsors of the proposal had expressed the expectation that all of the facilities which the United States and the United Kingdom would make eligible under their offers would maintain records and submit reports to the IAEA, to the same extent as set forth in INFCIRC/153). The United States referred to the concept of selection by the Agency of certain categories of facilities, from among the U.S. facilities which the United States would make eligible for the application of IAEA safeguards, as suggested by Australia, Japan, Italy and the Federal Republic of Germany in the "Timbs proposal". It was expected, based upon the discussion of that suggestion in the Safeguards Committee, that the Director General would consult with the four sponsors and other "interested" governments in making such selections. It was also expected that changes would be made by the Director General in the selections, from time to time, and that previously selected facilities would be removed from safeguards while others would be selected to take their place.

An aspect of INFCIRC/153 which the United States foresaw as difficult to incorporate in the U.S.-IAEA agreement were the provisions dealing with imports of nuclear material into and its export out of the United States. Those provisions were based upon the situation where IAEA safeguards were required to be applied to all nuclear material in the peaceful nuclear activities of a state, as was the case for non-nuclear weapon states party to the NPT. The counterpart, in the case of the United States, in which IAEA safeguards were applied only to a part of its nuclear material, would be that the "international transfer" procedures of INFCIRC/153 (primarily, advance notifications to the Agency) would apply only to imports to and exports from a facility in which safeguards were being applied. Such fragmentary information would be of little utility to the IAEA, whose interest in obtaining information from the United States on international transfers of nuclear material was to confirm information it would be receiving from non-nuclear weapon states party to the NPT concerning their exports and imports of nuclear material.

It was agreed, at the end of the first formal negotiating session, that the United States would prepare an initial draft of the agreement for consideration by the IAEA team.

DRAFTING OF THE U.S.-IAEA AGREEMENT

The initial drafting of the U.S.-IAEA agreement text was carried out in Washington by a team drawn from the staffs of the AEC (including its regulatory staff), the Arms Control and Disarmament Agency and the Department of State. They had available the text of the Austria-IAEA agreement, which had been signed in September 1971, as a model to be adjusted to reflect the purpose of and special circumstances surrounding the U.S. offer, while minimizing the cost to the IAEA of implementing the offer.

The purpose of the offer—to demonstrate that no commercial disadvantage in international competition would be suffered by non-nuclear weapon states as a result of the application of IAEA safeguards in their facilities—required that when IAEA safeguards were to be applied in facilities in the United States, the same procedures should be followed by the IAEA and the same requirements placed upon facility operators and the government as would be the case of similar facilities in the non-nuclear weapon states party to the NPT. Thus, the technical requirements set forth in INFCIRC/153, concerning the submission to the IAEA of design information and its verification, the maintenance of specified records by the facility and the submission of reports to the IAEA concerning the status of nuclear material in the facility, as well as inspections by the IAEA of the facility should be applicable to those U.S. facilities in which safeguards would be applied by the IAEA.

It had been visualized at the time the offer was made, however, that a U.S. facility would be safeguarded only as long as the activity normally associated with it was not on “direct national security significance”. The AEC’s memorandum submitted to the Senate Foreign Relations Committee in July 1968 stated that the terms of the agreement with IAEA would reflect that limitation. It was necessary, for example, that a United States plant fabricating fuel elements under commercial arrangements for power reactors, be available to produce fuel elements for naval propulsion reactors, notwithstanding that the IAEA was applying safeguards to the plant. Similarly, the United States needed to reserve the right to remove nuclear material from a facility in which the IAEA was applying safeguards and to use that material for national security purposes.

Moreover, determinations regarding what constituted “direct national security significance”—in the list of United States facilities to which the offer applied or in the withdrawal of facilities from the list—could only be made by the United States. The IAEA could not review such determinations or play any other role in the process. Nothing would prevent the governments of the industrialized non-nuclear weapon states interested in the fulfillment of the U.S. offer, of course, from monitoring the determinations of the United States and if there was concern that the United States was misusing the “direct national security” exclusion to avoid the application of safeguards to a particular facility, the United States Government could be asked by those governments for an explanation.

The requirement for flexibility by the United States, in the interest of its national security, meant that the basic undertaking in the safeguards agreements concluded on the basis of INFCIRC/153 could not be used in the U.S.-IAEA agreement, since that undertaking calls for safeguarded nuclear material not to be diverted to nuclear weapons or other nuclear explosive devices. At the same time, care had to be taken that the undertaking in the U.S.-IAEA agreement did not establish an unhelpful precedent for other safeguards agreements with the IAEA.

The concept of selectivity by the IAEA in the application of safeguards in U.S. facilities called for special provisions in the U.S.-IAEA agreement, since the agreements based upon INFCIRC/153, with non-nuclear weapon states party to the NPT, required safeguards to be applied to *all* nuclear material in *all* peaceful nuclear activities. While

the United States alone was to list the U.S. facilities from which the selection would be made, the basic concept was that the IAEA alone would make the actual selections. During the drafting by the United States team, it was visualized that the IAEA, in the interest of economy, would select and apply safeguards in one group of U.S. facilities for one year or more, at which time the IAEA would cease the application of safeguards in that group and select another group. That concept could not, however, be embodied in the agreement as a requirement on the IAEA, since it could have been interpreted as narrowing the terms of the U.S. offer. The agreement, rather, should permit the selection by the IAEA of any or all of the facilities offered by the United States and should permit changes, at any time in the facilities selected. That approach, however, raised the possibility that the IAEA might limit its selections in such a way that facilities owned by one U.S. company would be safeguarded, while those of another competing U.S. company were not, or that the duration of the application of safeguards would be longer in one company's facilities than in those of another company. Various kinds of provisions were considered to meet such a contingency. In the end, it was recognized that it was not possible to anticipate and set forth criteria for the IAEA to follow in its selections to guard against all the possible variations in treatment among U.S. facilities in implementing the agreement. A provision for consultation by the IAEA with the United States would be included, for the sole purpose of avoiding discrimination in the selection of facilities and the application of safeguards.

The U.S. team was aware that interested non-nuclear weapon states had expressed the expectation, during the discussions in and around the Safeguards Committee, that all of the facilities offered by the United States should be required to maintain records and submit reports to the IAEA, in the manner and to the extent specified in INFCIRC/153. The U.S. team, in addressing that possibility, kept in mind the desirability of avoiding the characterization of such measures as "safeguards". That term was reserved for the situation where not only all of those measures were required but, in addition, the IAEA had the right to conduct inspections of the facilities, as prescribed in INFCIRC/153. Accordingly, in the early drafting by the U.S. team, it was visualized that the U.S.-IAEA agreement would address only those U.S. facilities which the Agency would select for the full "safeguards" regime, including inspections. Any other arrangements regarding the other facilities offered by the United States, would be made by an exchange of letters between the United States and the IAEA.

Agreements with non-nuclear weapon states party to the NPT include provisions setting forth procedures for the application of safeguards to nuclear material in "facilities" and in locations outside of facilities. A "facility" is defined in those agreements as "(a) A reactor, a critical facility, a conversion plant, a fabrication plant, a reprocessing plant, an isotope separation plant or a separate storage installation; or (b) Any location where nuclear material in amounts greater than one effective kilogram is customarily used." An examination of licenses issued by the United States for the possession of nuclear material showed several hundred of locations licensed to possess quanti-

ties below one effective kilogram. The standard requirements for the submission of information concerning each such location—the vast majority of which were universities, colleges, hospitals and other non-industrial institutions—would have generated a substantial amount of paper work unrelated to the purpose of the offer by the United States and of no apparent interest to the IAEA or the industrialized non-nuclear weapon states.

The drafting of meaningful and practical provisions for the U.S.-IAEA agreement relating to “international transfers” proved to be a most difficult task for the U.S. team and would require further study and discussion with the IAEA and with other governments, as well.

CONSULTATIONS WITH OTHER GOVERNMENTS AND THE IAEA

In February 1972, a draft of substantive parts of a U.S.-IAEA agreement was proposed to the IAEA negotiating team; a draft of a complete agreement was provided in November of that year.

The IAEA negotiating team commented on the U.S. draft in informal discussions. One of the major concerns of the IAEA was the omission of any provisions in the U.S. draft for notification to the IAEA of exports from or imports into the United States of nuclear material. In the discussions of this point, it became clear that the IAEA team's concern was not directly related to the implementation of the U.S. offer, but rather to the IAEA's hope that information from the United States concerning its international transfers would provide confirmation of information to be received by the IAEA, from non-nuclear weapon states party to the NPT, concerning their shipments to and from the United States. It was suggested to the IAEA team that they study the question of the kinds of information from the United States which the Secretariat would find most helpful in carrying out its responsibilities under its agreements with non-nuclear weapon states party to the NPT. The United States would then consider what steps could be taken to make available the desired information.

In due course, the results of the IAEA's study were received and the United States consulted the United Kingdom concerning the means by which the needs of the IAEA might be met. It was concluded that the U.S.-IAEA and U.K.-IAEA safeguards agreements were not the best vehicles for such arrangements and that collateral arrangements would be preferable. Moreover, it appeared that the Soviet Union, which had recently entered the international uranium enrichment market, would be a source of such information as well and might be equally interested in assisting the IAEA by making the desired information available.

Accordingly, representatives of the three governments met in Vienna and developed uniform policies for the provision of information to the IAEA concerning their respective exports and imports of nuclear material. Each of the three governments informed the Director General of the IAEA, by identical letters dated July 10, 1974, that it would provide, on a continuing basis, (a) advance information (and confirmation after shipment) of each export for peaceful purposes to any non-nuclear weapon states of nuclear material, in an amount exceeding one effective kilogram, and (b) information concerning each import of nuclear material, in an amount greater than one effective kilogram, which had been subject to IAEA safeguards in the country from which

it was exported. The full text of the letters from the United States, the United Kingdom and the Soviet Union were published by the IAEA in INFCIRC/207.

Consultations were also carried out with industrialized non-nuclear weapon states concerning the manner in which the U.S. offer would be implemented and the way the various aspects might be reflected in the provisions of the agreement. No objection was encountered in restricting the implementation of the offer to "facilities", as defined in INFCIRC/153, or in the arrangements for providing information to the Agency concerning U.S. exports and imports of nuclear material.

The inclusion of an opportunity for "selectivity" in the application of safeguards in U.S. facilities was welcomed by the other governments, but the treatment of "unselected" facilities was the subject of much discussion. A solution was found in an arrangement whereby the IAEA would be permitted to make secondary selections from among the U.S. facilities offered, but not selected by the IAEA for application of the full regime of safeguards. By that means, the IAEA could adjust the pace at which it would receive information from the remaining offered facilities, to the Agency's capacity to deal with it. The terms of the agreement would not preclude the Agency from designating all those remaining offered facilities to be in that category.

These and other refinements were taken into account in the drafting by the U.S. team of successive agreement texts. In order to simplify the drafting and to clarify the procedures applicable to the facilities designated by the Agency in the two-tier selection process, the format of the agreement was changed. The agreement proper contained the general provisions and those dealing with the safeguarding of nuclear material in facilities selected by the IAEA for the application of the full safeguards regime, including inspections. The provisions dealing with the secondary selection—of facilities for which design information would be submitted (and verified by visits of inspectors to the facilities), records would be maintained and reports submitted—were grouped into a "protocol" which would be an integral part of the overall agreement.

This structure of the agreement made more clear the distinctions in the status of various groups of U.S. facilities when the agreement entered into force. These would be:

A. Facilities excluded by the United States from its offer for reasons of direct national security significance.

B. Facilities included by the United States in a list, provided to the IAEA, of those facilities eligible under the offer.

C. Facilities selected, at any time, by the IAEA for the applications of the full regime of safeguards, including inspection, from among those listed by the United States as eligible (B. above).

D. Facilities selected, at any time, by the IAEA for treatment under the "protocol" to the agreement, from among those remaining on the list.

E. Facilities remaining on the list of eligible facilities (B. above) which, at any time, had not been selected by the IAEA for treatment under either the agreement proper (C. above) or the protocol (D. above).

The group of facilities in each of the foregoing categories is subject to change. Under the terms of the agreement, changes in categories A and B are entirely at the discretion of the United States, while changes in the other categories are entirely at the discretion of the IAEA, subject only to agreement with the United States that the IAEA's action takes into account the necessity for the United States to avoid discriminatory treatment of U.S. commercial firms.

The two-tier selection process provided for by the agreement proper and the protocol gives the IAEA an opportunity to adjust its workload in implementing the U.S. offer. It could, for example, select facilities for treatment under the protocol in anticipation of their future selection for treatment under the agreement proper, thereby permitting all the procedures, except for inspections, to be established in advance of initiation of inspections. Conversely, when the IAEA decides it no longer wishes to apply its safeguards, including inspection, in a particular facility, the IAEA would decide whether it wishes that facility to continue to maintain records and to submit reports, in which case the IAEA would select it for treatment under the protocol. On the other hand, the IAEA might decide that there was no further interest in that facility and therefore to allow it to be among those in group E.

The flexibility which the two-tier selection arrangement allows the IAEA will permit the implementation of the agreement by the IAEA in a manner so as to achieve the objective of the U.S. offer at the minimum cost to the Agency.

THE U.S. OFFER AND NPT RATIFICATION AND IMPLEMENTATION

President Johnson's announcement of December 2, 1967 stated that the IAEA would be permitted to apply its safeguards in U.S. facilities when safeguards are applied under the NPT. Ambassador Glennan's letter to the Director General in June 1971, agreeing to the opening of negotiations of the U.S.-IAEA agreement by which the offer would be implemented, made it clear that the timing of those negotiations and the entry into force of the resulting agreement would be related to the timing and entry into force of the safeguards agreements to be included by the IAEA with a representative number of the "more industrialized" non-nuclear weapon states.

All of the non-nuclear weapon states which were members of the European Community at the time the NPT was opened for signature (Belgium, the Federal Republic of Germany, Italy, Luxembourg, and the Netherlands) had signed the NPT by November 1969. Each had announced, at the time of signature, that it would not ratify the Treaty until negotiations between the Community and the IAEA had led to a satisfactory safeguards agreement. The negotiations by Euratom and the IAEA were completed in April 1973, by the signature of the agreement by the Community and each of the non-nuclear weapon states of the Community, including Denmark and Ireland, which had recently joined the Community. Ratification of the NPT by each of the original five non-nuclear weapon states was then undertaken.⁵ Those ratifications were completed in May 1975, when

⁵ Ireland had ratified the NPT in July 1968 and Denmark had done so in January 1969.

the five states deposited instruments of ratification. The Euratom-IAEA agreement, however, could not enter into force until the promulgation of regulations by the Community and the adoption of the necessary conforming legislation by each of the states concerned. Only when that process was completed, did the agreement enter into force in February 1977.

In September 1971, the delegate of the Federal Republic of Germany, in his address to the General Conference of the IAEA had stressed the importance which his government attached "with a view to ensuring equal opportunities in the economic and scientific fields, to the fulfillment of the assurance given by the United States and Great Britain concerning the application of safeguards to their peaceful nuclear activities. . . ." The statement issued by the Federal Republic in connection with its signing the NPT, in November 1969, stressed the vital importance it attached to the undertakings by the United States and the United Kingdom concerning the application of safeguards to their peaceful nuclear activities. The same statement was made in connection with the deposit of its instrument of ratification of the NPT in May 1975.

Japan signed the NPT in February 1970. Its statement issued on that occasion includes the following:

"The Government of Japan greatly appreciates, as measures supplementing this Treaty, the declarations of the Governments of the United States and the United Kingdom, which are both nuclear-weapon states, that they will accept the application of the safeguards of the International Atomic Energy Agency to all their nuclear activities, excluding only those directly related to their national security, and earnestly hopes that these assurances will be faithfully implemented."

A similar reference to the importance attached to the offers by the United States was made in Japan's statement upon its ratification of the NPT in June 1976.

Later in that month, the Board of Governors of the IAEA considered the text of the U.K.-Euratom-IAEA agreement, by which the U.K. offer would be implemented, and authorized the Director General to conclude the agreement. During the Board's discussion which led to that result, the representative of the Federal Republic of Germany recalled that his government had consistently upheld the view that the NPT should not open the door to commercial or competitive inequality and that it had been among the first to welcome the unilateral commitments undertaken by the United States and the United Kingdom. His government believed that the inevitable inequality between nuclear-weapon states should be limited strictly to prevention of the proliferation of nuclear weapons. As far as commercial, scientific and technological questions were concerned, the danger of inequality had been largely eliminated, for which he expressed his sincere gratitude to the United Kingdom for its efforts to conclude an appropriate agreement. He looked forward with similarly high expectations to the conclusion in the near future of an agreement on the same lines between the United States and the Agency.

The representative of Italy endorsed fully the views of the representative of the Federal Republic of Germany.

The representative of Japan expressed the great appreciation of his government for the voluntary offers by nuclear-weapon states, as a practical step towards reducing the inequality between nuclear-weapon states and non-nuclear weapon states under the NPT. He stated that the main purpose of applying safeguards under agreements such as that of the United Kingdom was to ensure that operators of facilities or manufacturers of nuclear materials in nuclear-weapon states should obtain no advantage over competitors in the non-nuclear weapon states. To that end, facilities classed as "sensitive" in terms of international competition, as well as facilities of advanced design incorporating new technology, should be placed on the list of eligible facilities (by the United Kingdom) and should be subject to designation (by the IAEA, for the application of the full regime of safeguards, including inspection) in accordance with the agreement. He hoped that the IAEA would give consideration to consulting with interested non-nuclear weapon states prior to making such designations.

The representative of Australia, which had ratified the NPT in January 1973 and whose safeguards agreement had entered into force in July 1974, spoke in approval of the proposed agreement with the United Kingdom, looked forward to the conclusion of a similar agreement with the United States and hoped that other nuclear-weapon states would follow suit. In reply to several speakers (Iran, Yugoslavia and Zaire) who had expressed concern at the costs and questioned the value of implementing such agreements with nuclear-weapon states, he stated that it would be necessary to ensure that the additional expenditures required for implementing the agreements were not inordinately high. Assurance should nevertheless be given that the safeguards imposed on the facilities designated (by the IAEA, from the list provided by the nuclear-weapon state) were applied no less rigorously than in any other state party to the NPT. He also noted that the agreement with the United Kingdom would help to reassure suppliers of nuclear raw materials that their materials were not going to be diverted for nuclear weapons purposes.

In reply to a question by the representative of India concerning the estimated expenditures by the IAEA for implementing the agreement with the United Kingdom, the head of the IAEA's Department of Safeguards stated that the intention was to minimize the deployment of the Agency's safeguards resources for that purpose.

Shortly after the Board's approval of the agreement which would implement the offer by the United Kingdom, the United States and the IAEA completed the final details of the drafting of the U.S.-IAEA agreement and the decision was made by the United States to seek its approval by the Board of Governors at its next meeting, scheduled for September. At the time, neither the safeguards agreement with Euratom and its non-nuclear weapon states nor that with Japan had entered into force. The agreement with Japan was, in fact, still in negotiation with the IAEA. Positive action on the U.S.-IAEA agreement was seen as providing a further stimulant to the Euratom member states and Japan to bring their respective safeguards agreements into force.

Accordingly, the proposed U.S.-IAEA agreement was placed on the agenda of the Board and the text was circulated to all members of the Agency well in advance of the Board meeting. Prior to the meeting, the U.S. Mission to the IAEA consulted the missions of many of the governments represented on the Board,⁶ in order to explain the background and objectives of the U.S. offer and to answer questions concerning the provisions of the proposed agreement.

In his customary memorandum to the members of the Board, transmitting the draft text of the proposed U.S.-IAEA agreement, the Director General called attention to the provisions of the agreement and of the protocol referring to the need to avoid discrimination between U.S. commercial firms in the identification (selection) of facilities offered by the United States. He stated that, in making such identifications, the Agency will also observe the criteria referred to in the Safeguards Committee (the "Timb's proposal"), which "will involve selection of 'facilities of advanced design incorporating new technology, and those which [are] sensitive in terms of international competition'".

The Director General's memorandum makes no reference to the wish often expressed, both privately and publicly, by certain non-nuclear weapon states party to the NPT, that he consult "interested" governments in identifying U.S. facilities. It is unlikely that he would ignore their desires and, in fact, may have privately assured them that they would be consulted.

At the meeting of the Board, in September, the U.S. representative, Ambassador Gerald Tape, reviewed the purpose of the proposed agreement. The representative of the Federal Republic of Germany stated that his government believed that the NPT should never interfere with the commercial activities of states and he therefore congratulated the United States and the United Kingdom for having submitted their civil nuclear facilities to safeguards. He only regretted that the other nuclear-weapon states were not doing the same. His views were supported by the representatives of the Netherlands and of Italy. The representative of Japan commended the initiative of the United States and hoped it would be followed by other countries. The representative of the Soviet Union noted that the submission of nuclear facilities to safeguards, as foreseen in the U.S.-IAEA agreement, did not stem from obligations laid down in the NPT. The representative of Iran recalled the views he had expressed at the previous meeting of the Board concerning the costs of implementing such agreements.

The Board (acting by consensus, as is customary) authorized the Director General to conclude the proposed agreement with the United States and subsequently to implement it.

In February 1977, the agreement of the IAEA with Euratom and its non-nuclear weapon states entered into force.

In March 1977, the Board approved the agreement with Japan; the agreement came into force in December 1977.

⁶ Members of the Board of Governors in September 1976 were Argentina (Chairman), Australia, Bangladesh, Brazil, Canada, Chile, Columbia, Denmark, France, German Democratic Republic, Federal Republic of Germany, India, Indonesia, Iran, Iraq, Italy, Japan, Libyan Arab Republic, Netherlands, Philippines, Poland, Senegal, South Africa, Spain, Thailand, Turkey, U.S.S.R., United Kingdom, United States, Uruguay, Venezuela, Yugoslavia, Zaire and Zambia.

In August 1978, the U.K.-Euratom-IAEA agreement entered into force.

In November 1978, the United Nations General Assembly considered the report of the International Atomic Energy Agency, made annually to that body. During the discussion, the delegates of both Japan and the Federal Republic of Germany again stressed the importance their governments attached to the voluntary offers by the United States and the United Kingdom.

CURRENT DIPLOMATIC SIGNIFICANCE

There seems little doubt that the U.S. offer was a significant factor in inducing the adherence to the NPT by a number of industrialized nuclear-weapon states. The legislatures of those countries, in approving ratification, certainly were made aware of the U.S. offer and expected it to be implemented in a manner which would satisfy concerns regarding the effect of IAEA safeguards on the ability of their industries to compete in the international market. The safeguards agreements which those countries have concluded with the IAEA, in accordance with the NPT, are in force and safeguards, including inspections, are being carried out in their industries pursuant to those agreements. The governments of those countries therefore continue to show keen interest in seeing that the U.S.-IAEA agreement comes into force and that it will be implemented in accordance with the terms of the original offer by President Johnson—that “* * * the Agency will be able to inspect a broad range of U.S. nuclear activities, both governmental and private * * *.”

The reassessment of U.S. nonproliferation policies, during recent years, has focused increased attention on the safeguards system of the IAEA. The Congress, for example, has appropriated funds to be used in support of IAEA safeguards and a substantial program of special assistance to the IAEA, aimed at increasing the effectiveness and efficiency of IAEA safeguards, has been undertaken. Several other governments have initiated similar programs with the IAEA. The IAEA Secretariat, at the same time, has instituted systematic evaluations of its safeguard functions which provide opportunities to identify technical and other aspects which need improvement. The application of IAEA safeguards in U.S. facilities will enable the United States, on the basis of its own experience and observations, to evaluate the performance of the IAEA system and to judge its impact upon the operations of facilities of different types.

The introduction of changes and improvements in IAEA safeguards will require the endorsement and support of the members of the Agency, especially those which are major contributors to the Agency's budget. The United States will be in a much better position to muster support among other members for changes and improvements needed to be made in IAEA safeguards, if it is seen to be among those states in which those safeguards are applied.

While not foreseen at the time it was made, the U.S. offer may very well become vital in assuring an adequate international supply of low-enriched uranium fuel for light-water reactors. Canada and Australia are expected to be major sources of the natural uranium, which is en-

riched up to 5 percent in U-235 in plants for that purpose, presently located in the Soviet Union, France, the Netherlands and in the United States, which has available the greatest capacity. Canada and Australia, however, have each adopted non-proliferation policies requiring the application of IAEA safeguards in all the peaceful nuclear activities of any state (including a nuclear-weapon state) to which its uranium is supplied.

Unless the United States can satisfy the Canadian and Australian requirements for the application of IAEA safeguards in the United States, the utilities in other countries which purchase uranium from Canada or Australia will be unable to have the uranium sent to the United States for enrichment. Consequences, both commercial and political, which could result from that situation, would likely be inconsistent with the non-proliferation objectives of the United States. For example, the shortage of enrichment capacity could stimulate additional countries to establish their own enrichment plants.

There are indications, however, that implementation of the U.S.-IAEA safeguards agreement will play an important role in satisfying the requirements of Canada and Australia for the export of uranium. The "interim" agreements by the United States with Canada in 1976⁷ and 1977,⁸ concerning the transfer of nuclear materials and equipment, refer to implementation of the U.S.-IAEA agreement as the means by which Canada's requirements for safeguards would be met in the United States. The statement by the representative of Australia in the IAEA Board of Governors meeting in June 1976, in which he characterized the U.K.-Euratom-IAEA agreement as helping to reassure suppliers of nuclear raw materials that such material would not be diverted, is relevant. Australia's role in the Safeguards Committee, in the development of a mechanism for achieving the purpose of the United States and United Kingdom offers at minimum cost to the IAEA, is also recalled.

Negotiations of new or amended agreements for cooperation in the civil uses of atomic energy are underway by the United States with both Canada and Australia, as called for in the Nuclear Non-Proliferation Act of 1978. Implementation of the U.S.-IAEA agreement is quite likely to be recognized in those negotiations as the practical means by which the United States can satisfy the requirements for safeguards of Canada and Australia and thus be able to receive uranium from those countries and to export the resulting enriched uranium.

⁷ TIAS No. 8287.

⁸ TIAS No. 8782

APPENDIX I

95TH CONGRESS }
2d Session }

SENATE

EXECUTIVE
BAGREEMENT WITH THE INTERNATIONAL ATOMIC
ENERGY AGENCY FOR THE APPLICATION OF SAFE-
GUARDS IN THE UNITED STATES OF AMERICA,
WITH PROTOCOL

MESSAGE

FROM

THE PRESIDENT OF THE UNITED STATES

TRANSMITTING

THE AGREEMENT BETWEEN THE GOVERNMENT OF THE
UNITED STATES OF AMERICA AND THE INTERNATIONAL
ATOMIC ENERGY AGENCY FOR THE APPLICATION OF SAFE-
GUARDS IN THE UNITED STATES OF AMERICA, WITH AT-
TACHED PROTOCOL, APPROVED BY THE BOARD OF GOVER-
NORS OF THE AGENCY ON SEPTEMBER 17, 1976



FEBRUARY 9, 1978.—Treaty was read the first time and, together with the
accompanying papers, referred to the Committee on Foreign Relations
and ordered to be printed for the use of the Senate

U.S. GOVERNMENT PRINTING OFFICE

29-118

WASHINGTON : 1978

LETTER OF TRANSMITTAL

THE WHITE HOUSE, *February 9, 1978.*

To the Senate of the United States:

I submit herewith, for Senate advice and consent to ratification, the Agreement between the United States of America and the International Atomic Energy Agency ("Agency") for the Application of Safeguards in the United States of America, with attached Protocol, approved by the Board of Governors of the Agency on September 17, 1976. This Agreement provides for application of Agency safeguards to nuclear facilities in the United States, other than those having direct national security significance. The Agreement will enter into force when the United States notifies the Agency that its constitutional and statutory requirements for entry into force have been met.

The United States, as a nuclear weapons state party to the Treaty on the Non-Proliferation of Nuclear Weapons ("NPT"), is not obligated to accept Agency safeguards on its peaceful nuclear activities. On December 2, 1967, President Johnson offered to place United States nuclear facilities, except those with direct national security significance, under Agency safeguards in an effort to demonstrate that the application of those safeguards would not work to any nation's commercial disadvantage. Specifically, President Johnson stated:

* * * I want to make it clear to the world that we in the United States are not asking any country to accept safeguards that we are unwilling to accept ourselves.

So I am, today, announcing that when such safeguards are applied under the treaty, the United States will permit the International Atomic Energy Agency to apply its safeguards to all nuclear activities in the United States—excluding only those with direct national security significance.

Under this offer the Agency will be able to inspect a broad range of U.S. nuclear activities, both governmental and private, including the fuel in nuclear power reactors owned by utilities for generating electricity, and the fabrication, and chemical reprocessing of such fuel * * *.

Over the next ten years, both Presidents Nixon and Ford reaffirmed that offer.

I also transmit, for the information of the Senate, the report of the Department of State concerning the Agreement.

Universal participation in the NPT is a central goal of our non-proliferation policy. The entry into force of this Agreement would encourage that participation, and would fulfill our long-standing commitment to accept safeguards. I urge the Senate to act favorably on this Agreement at an early date and give its advice and consent to ratification.

JIMMY CARTER.

LETTER OF SUBMITTAL

DEPARTMENT OF STATE,
Washington, December 14, 1977.

The PRESIDENT,
The White House.

THE PRESIDENT: I have the honor to submit to you, with a view to its transmission to the Senate for advice and consent to ratification, the Agreement between the Government of the United States and the International Atomic Energy Agency for the Application of Safeguards in the United States of America, with attached Protocol. This Agreement was approved by the Board of Governors of the International Atomic Energy Agency ("Agency") on September 17, 1976 and will enter into force when the United States informs the Agency that United States constitutional and statutory requirements for entry into force have been met.

Background

The Treaty on the Non-Proliferation of Nuclear Weapons ("NPT"), to which the United States is a party, commits non-nuclear weapon states parties to accept Agency safeguards on all their peaceful nuclear activities. Although the United States, as a nuclear weapons state, is under no legal obligation to accept such safeguards, it has been the announced policy of this Government to permit the application of Agency safeguards to its nuclear facilities, excluding only those of direct national security significance. By submitting itself to the same safeguard others are subject to, it is the United States' intention to demonstrate that adherence to the Treaty does not place other countries at a commercial disadvantage, either because of the increased costs associated with safeguards or because of risk of exposure of proprietary information. President Johnson first enunciated this policy in 1967; both Presidents Nixon and Ford reaffirmed it. In September 1976, you stated your intention to bring quickly into force the "Voluntary Offer," as the Agreement has come to be called.¹

In addition to encouraging adherence to the Non-Proliferation Treaty, it is hoped that the Offer will help to improve Agency safeguards. Agency inspectors and United States personnel from the Department of Energy ("DOE") and the Nuclear Regulatory Commission ("NRC") will be able to combine their experience and collaborate in making the safeguards system more efficient and effective.

The Voluntary Offer by the United States has already had several effects. In anticipation of the United States' bringing the Offer into force, both the Federal Republic of Germany and Japan ratified the Non-Proliferation Treaty. In both cases, United States willingness to

¹ A similar agreement between the Agency and the United Kingdom has also been approved by the Board of Governors.

enter into a safeguards agreement with the Agency was a substantial incentive. Moreover, to ensure uniformity in its non-proliferation policy, the Canadian Government has conditioned use of Canadian-origin uranium by United States utilities on the entry into force of Agency safeguards in the United States. Until the offer enters into force, Canadian ore may be enriched in DOE facilities, but may not, without written permission of the Atomic Energy Control Board of Canada, be fabricated into fuel or used in United States power reactors.

Description of Proposed Agreement

The Agreement is based on the standard Agency safeguards agreement with NPT parties (INFCIRC/153), except that United States facilities of direct national security significance are excluded from its coverage. Part I of the Agreement (Articles 1-26) sets out Agency and United States commitments; Part II (Articles 27-90) describes the implementing procedures. The Protocol to the Agreement describes procedures for facilities not subject to routine inspection by the Agency.

Under the Agreement, the United States will submit to the Agency a list of eligible facilities, i.e. all U.S. nuclear facilities except those with direct national security significance. The eligible list will be part of the Subsidiary Arrangements of the Agreement. Pursuant to Articles 2(b), 39(b) and 39(c), the Agency will identify on that list certain facilities which will be subject to the full provision of Agency safeguards. For these facilities, the United States must submit inventory and design information to the Agency. NRC or DOE, as appropriate, will obtain the information from the operator. Within 90 days of the entry into force of the Agreement, the United States will submit the design information to the Agency, which will prepare facility attachments specifying accountancy procedures, key measurement points, material balance areas, and the like, to enable it effectively to apply safeguards. From time to time pursuant to Article 39(b) (ii) the Agency will designate new facilities to which it will apply safeguards. Within 90 days of such designation, the United States must submit the relevant inventory and design information to the Agency. Eventually, it is estimated that there will be about 12 to 15 facilities subject to safeguards inspection at any one time, although the actual number identified by the Agency will represent a balance between the political objectives of the Agreement and the cost of applying safeguards.

Pursuant to the Protocol, the Agency may also designate facilities from the eligible list which it will not inspect, but for which inventory and design information must be submitted and Transitional Subsidiary Arrangements prepared. The same accountancy reports required by the Agency for facilities identified under Articles 2(b), 39(b), and 39(c) must also be provided for facilities identified under the Protocol. It is anticipated that all facilities not designated under these Articles will eventually be included on the list prepared pursuant to the Protocol.

As stated previously, one purpose of the Offer was to reassure those States concerned about the possibility that safeguards might compromise proprietary information. It should be noted that under Article 5 of the Agreement, as well as Article VII.F of the IAEA Statute, the Agency is committed to protect commercial and industrial secrets, and other confidential information. The Agency's operating

regulations provide physical protection to safeguard confidential information similar to that which the United States Government provides for classified national security information. The Agency will require only the minimum amount of information necessary to carry out its responsibilities under the Agreement (Article 8(b)). Moreover, when particularly sensitive design information is required to be shown to the Agency, the United States may ask that it be examined on United States premises and not physically communicated to the Agency (Article 8(c)). These provisions are common to all Agency safeguards agreements written pursuant to the NPT. Historically, the Agency has an excellent record of protecting confidential information; no case has been brought to our attention of compromise of such information.

As has been indicated, not all United States facilities on the eligible list will be subject to Agency safeguards inspection and the attendant costs. To remove the potential inequitable treatment of various facilities, the Agency has agreed, to "proceed in a manner which the Agency and the United States mutually agree takes into account the requirement on the United States to avoid discriminatory treatment as between United States commercial firms similarly situated." (Article 2(c)). Although the Agency is not obligated to establish detailed criteria for identification of facilities, it has stated that it will give highest priority to the inspection of facilities of advanced design and technology as well as those which are sensitive in terms of international competition. At the same time, the Agency will also select for inspection, on a rotating basis, various facilities from the remainder of United States installations. Adherence to these guidelines would fulfill the foregoing requirement.

The Agency's fundamental safeguards measure is materials accountancy. As in other countries, the accountancy system in the United States is based upon a system of records kept at the direction of the responsible national agencies—here the NRC and DOE. For facilities identified under Articles 2(b), 39(b), and 39(c) an initial inventory of nuclear materials (source and special nuclear materials) is established, and the accountancy system tracks subsequent changes in the inventory. Facility operators will be required to keep accounting and operating records and submit accounting reports based on these records to the NRC or DOE. In turn, the United States will submit to the Agency accounting reports in respect of nuclear material subject to safeguards.

Not all nuclear material is subject to the safeguards. Mining and ore processing activities are excluded (Article 33). At the request of the United States, the Agency is required to exempt small quantities of nuclear materials (Article 36).

The Agency may inspect the facilities identified under Articles 2(b), 39(b), and 39(c) in order to verify design information; verify the initial inventory information; identify and verify changes that have occurred after the initial report; verify that reports to it are consistent with the records kept by the operators; verify the identity, location, quantity and composition of nuclear material subject to safeguards; and verify information on the possible causes of material unaccounted for, shipper/receiver differences and uncertainties in book inventory (Articles 48, 69, 70). The United States must also report

without delay any unusual incidents or circumstances that may indicate loss of material subject to safeguards or unexpected changes in containment of nuclear material (Articles 66, 71).

Except for a relatively small number of unannounced inspections of random facilities subject to safeguards, Agency inspections must be announced in advance (Articles 81, 82). They must also be performed in such a way as to avoid hampering the operation of the facility (Article 85). Agency inspectors may not themselves take samples; they must ask the operator's personnel to take them. Nor may they operate a facility or direct that the staff carry out any operation. As to the inspectors themselves, the United States may object to inspectors, whereupon the Agency would propose others (Article 9). If the United States repeatedly refuses to accept inspectors, however, the Director General must so notify the Board of Governors, with a view to its taking "appropriate action" (Article 9(a)(iii)).

The Agency also uses containment and surveillance measures. In general, the Agency makes use of existing containment features of a facility and of containers of special nuclear material, storage areas and other places holding nuclear material. Surveillance includes human, optical and electronic observation of, e.g., storage areas.

Safeguards on a given quantity of special nuclear material terminate when the material is consumed, becomes diluted so that it is no longer usable for any nuclear activity relevant from the point of view of safeguards, has become practically irrecoverable, or is moved to a facility not subject to Agency safeguards (Article 11). In addition, the United States may remove facilities from the eligible list, including facilities currently being safeguarded; at such time, safeguards on the material therein are terminated (Article 34).

Articles 17 to 21 of the Agreement deal with disputes or questions arising under the Agreement. In general disputes will be settled by binding arbitration. Notwithstanding the general procedure, if the Board of Governors of the Agency decides that "an action by the United States is essential and urgent to ensure compliance" with the Agreement, it may call on the United States to take such action. If the Board determines that there has been non-compliance, it may call upon the United States to remedy the non-compliance and, if the United States fails to take "fully corrective action within a reasonable time," the Board is to report the non-compliance to the Security Council and the General Assembly of the United Nations and take other action provided for by Article XII of the Agency Statute. These other measures may include the suspension of the privileges and rights of membership, including the right to ask for the application of safeguards. Both the United States and the Agency are committed to consult at the request of the other on any questions arising out of the application or interpretation of the Agreement, and the United States may ask the Board of Governors to consider any such questions.

Under Article 22 of the Agreement the United States must initiate steps to suspend the application of Agency safeguards in effect in the United States under trilateral safeguards transfer agreements, while assuring that material of like amount and composition is subject to Agency safeguards under the new Agreement. For example, certain Japanese origin material in the United States is under Agency safe-

guards. We are preparing a protocol to the trilateral United States-Japan-IAEA safeguards transfer agreement to effect a transfer of this material from coverage under that agreement to coverage under the United States-IAEA Agreement.

As stated earlier, the Agreement will come into force only when the United States has notified the Agency in writing that its statutory and constitutional requirements for entry into force have been met. These include approval by two-thirds of the Senate as required under Article II, section 2 of the United States Constitution, ratification by the President, and subsequent deposit of the treaty instrument. The Agreement is to remain in force as long as the United States is a party to the Treaty on the Non-Proliferation of Nuclear Weapons. The parties may agree to modify the Agreement in order to ensure that it continues to serve its originally intended purposes, and failing agreement, may terminate the Agreement on six-months' notice.

The Department of State, the Arms Control and Disarmament Agency ("ACDA"), and the Atomic Energy Commission were primarily responsible for the negotiation of this Agreement. The responsibility for preparing for its entry into force, including negotiation of subsidiary arrangements, has been undertaken by an inter-agency group comprised of representatives of the Department of State, ACDA, NRC, DOE and to a lesser extent, the Department of Defense. The Agreement has the approval of all the named departments and agencies.

I recommend that you transmit this to the Senate with the recommendation that it be approved at an early date.

Respectfully submitted.

WARREN CHRISTOPHER.

AGREEMENT BETWEEN THE UNITED STATES OF AMERICA AND THE INTERNATIONAL ATOMIC ENERGY AGENCY FOR THE APPLICATION OF SAFEGUARDS IN THE UNITED STATES OF AMERICA

Whereas the United States of America (hereinafter referred to as the "United States") is a Party to the Treaty on the Non-Proliferation of Nuclear Weapons (hereinafter referred to as the "Treaty") which was opened for signature at London, Moscow and Washington on 1 July 1968 and which entered into force on 5 March 1970;

Whereas States Parties to the Treaty undertake to co-operate in facilitating the application of International Atomic Energy Agency (hereinafter referred to as the "Agency") safeguards on peaceful nuclear activities;

Whereas non-nuclear-weapon States Parties to the Treaty undertake to accept safeguards, as set forth in an agreement to be negotiated and concluded with the Agency, on all source or special fissionable material in all their peaceful nuclear activities for the exclusive purpose of verification of the fulfillment of their obligations under the Treaty with a view to preventing diversion of nuclear energy from peaceful uses to nuclear weapons or other nuclear explosive devices;

Whereas the United States, a nuclear-weapon State as defined by the Treaty, has indicated that at such time as safeguards are being generally applied in accordance with paragraph 1 of Article III of the Treaty, the United States will permit the Agency to apply its safeguards to all nuclear activities in the United States—excluding only those with direct national security significance—by concluding a safeguards agreement with the Agency for that purpose;

Whereas the United States has made this offer and has entered into this agreement for the purpose of encouraging widespread adherence to the Treaty by demonstrating to non-nuclear-weapon States that they would not be placed at a commercial disadvantage by reason of the application of safeguards pursuant to the Treaty;

Whereas the purpose of a safeguards agreement giving effect to this offer by the United States would thus differ necessarily from the purposes of safeguards agreements concluded between the Agency and non-nuclear-weapon States Party to the Treaty;

Whereas it is in the interest of Members of the Agency, that, without prejudice to the principles and integrity of the Agency's safeguards system, the expenditure of the Agency's financial and other resources for implementation of such an agreement not exceed that necessary to accomplish the purpose of the Agreement;

Whereas the Agency is authorized, pursuant to Article III of the Statute of the International Atomic Energy Agency (hereinafter referred to as the "Statute"), to conclude such a safeguards agreement;

Now, therefore, the United States and the Agency have agreed as follows:

(1)

PART I

Article 1

(a) The United States undertakes to permit the Agency to apply safeguards, in accordance with the terms of this Agreement, on all source or special fissionable material in all facilities within the United States, excluding only those facilities associated with activities with direct national security significance to the United States, with a view to enabling the Agency to verify that such material is not withdrawn, except as provided for in this Agreement, from activities in facilities while such material is being safeguarded under this Agreement.

(b) The United States shall, upon entry in force of this Agreement, provide the Agency with a list of facilities within the United States not associated with activities with direct national security significance to the United States and may, in accordance with the procedures set forth in Part II of this Agreement, add facilities to or remove facilities from that list as it deems appropriate.

(c) The United States may, in accordance with the procedures set forth in this Agreement, withdraw nuclear material from activities in facilities included in the list referred to in Article 1(b).

Article 2

(a) The Agency shall have the right to apply safeguards, in accordance with the terms of this Agreement, on all source or special fissionable material in all facilities within the United States, excluding only those facilities associated with activities with direct national security significance to the United States, with a view to enabling the Agency to verify that such material is not withdrawn, except as provided for in this Agreement, from activities in facilities while such material is being safeguarded under this Agreement.

(b) The Agency shall, from time to time, identify to the United States those facilities, selected from the then current list provided by the United States in accordance with Article 1(b), in which the Agency wishes to apply safeguards, in accordance with the terms of this Agreement.

(c) In identifying facilities and in applying safeguards thereafter on source or special fissionable material in such facilities, the Agency shall proceed in a manner which the Agency and the United States mutually agree takes into account the requirement on the United States to avoid discriminatory treatment as between United States commercial firms similarly situated.

Article 3

(a) The United States and the Agency shall co-operate to facilitate the implementation of the safeguards provided for in this Agreement.

(b) The source or special fissionable material subject to safeguards under this Agreement shall be that material in those facilities which shall have been identified by the Agency at any given time pursuant to Article 2(b).

(c) The safeguards to be applied by the Agency under this Agreement on source or special fissionable material in facilities in the United

States shall be implemented by the same procedures followed by the Agency in applying its safeguards on similar material in similar facilities in non-nuclear-weapon States under agreements pursuant to paragraph 1 of Article III of the Treaty.

Article 4

The safeguards provided for in this Agreement shall be implemented in a manner designed:

(a) To avoid hampering the economic and technological development of the United States or international co-operation in the field of peaceful nuclear activities, including international exchange of nuclear material;

(b) To avoid undue interference in peaceful nuclear activities of the United States and in particular in the operation of the facilities; and

(c) To be consistent with prudent management practices required for the economic and safe conduct of nuclear activities.

Article 5

(a) The Agency shall take every precaution to protect commercial and industrial secrets and other confidential information coming to its knowledge in the implementation of this Agreement.

(b) (i) The Agency shall not publish or communicate to any State, organization or person any information obtained by it in connection with the implementation of this Agreement, except that specific information relating to the implementation thereof may be given to the Board of Governors of the Agency (hereinafter referred to as "the Board") and to such Agency staff members as require such knowledge by reason of their official duties in connection with safeguards, but only to the extent necessary for the Agency to fulfill its responsibilities in implementing this Agreement.

(ii) Summarized information on nuclear material subject to safeguards under this Agreement may be published upon the decision of the Board if the United States agrees thereto.

Article 6

(a) The Agency shall, in implementing safeguards pursuant to this Agreement, take full account of technological developments in the field of safeguards, and shall make every effort to ensure optimum cost-effectiveness and the application of the principle of safeguarding effectively the flow of nuclear material subject to safeguards under this Agreement by use of instruments and other techniques at certain strategic points to the extent that present or future technology permits.

(b) In order to ensure optimum cost-effectiveness, use shall be made, for example, of such means as:

(i) Containment as a means of defining material balance areas for accounting purposes;

(ii) Statistical techniques and random sampling in evaluating the flow of nuclear material; and

(iii) Concentration of verification procedures on those stages in the nuclear fuel cycle involving the production, processing, use

or storage of nuclear material from which nuclear weapons or other nuclear explosive devices could readily be made, and minimization of verification procedures in respect of other nuclear material, on condition that this does not hamper the Agency in applying safeguards under this Agreement.

Article 7

(a) The United States shall establish and maintain a system of accounting for and control of all nuclear material subject to safeguards under this Agreement.

(b) The Agency shall apply safeguards in accordance with Article 3(c) in such a manner as to enable the Agency to verify, in ascertaining that there has been no withdrawal of nuclear material, except as provided for in this Agreement, from activities in facilities while such material is being safeguarded under this Agreement, findings of the accounting and control system of the United States. The Agency's verification shall include, inter alia, independent measurements and observations conducted by the Agency in accordance with the procedures specified in Part II. The Agency, in its verification, shall take due account of the technical effectiveness of the system of the United States.

Article 8

(a) In order to ensure the effective implementation of safeguards under this Agreement, the United States shall, in accordance with the provisions set out in Part II, provide the Agency with information concerning nuclear material subject to safeguards under this Agreement and the features of facilities relevant to safeguarding such material.

(b) (i) The Agency shall require only the minimum amount of information and data consistent with carrying out its responsibilities under this Agreement.

(ii) Information pertaining to facilities shall be the minimum necessary for safeguarding nuclear material subject to safeguards under this Agreement.

(c) If the United States so requests, the Agency shall be prepared to examine on premises of the United States design information which the United States regards as being of particular sensitivity. Such information need not be physically transmitted to the Agency provided that it remains readily available for further examination by the Agency on premises of the United States.

Article 9

(a) (i) The Agency shall secure the consent of the United States to the designation of Agency inspectors to the United States.

(ii) If the United States, either upon proposal of a designation or at any other time after designation has been made, objects to the designation, the Agency shall propose to the United States an alternative designation or designations.

(iii) If, as a result of the repeated refusal of the United States to accept the designation of Agency inspectors, inspections to be conducted under this Agreement would be impeded, such refusal shall be

considered by the Board, upon referral by the Director General of the Agency (hereinafter referred to as "the Director General") with a view to its taking appropriate action.

(b) The United States shall take the necessary steps to ensure that Agency inspectors can effectively discharge their functions under this Agreement.

(c) The visits and activities of Agency inspectors shall be so arranged as:

(i) To reduce to a minimum the possible inconvenience and disturbance to the United States and to the peaceful nuclear activities inspected; and

(ii) To ensure protection of industrial secrets or any other confidential information coming to the inspectors' knowledge.

Article 10

The provisions of the International Organizations Immunities Act of the United States of America shall apply to Agency inspectors performing functions in the United States under this Agreement and to any property of the Agency used by them.

Article 11

Safeguards shall terminate on nuclear material upon determination by the Agency that the material has been consumed, or has been diluted in such a way that it is no longer usable for any nuclear activity relevant from the point of view of safeguards, or has become practicably irrecoverable.

Article 12

(a) If the United States intends to exercise its right to withdraw nuclear material from activities in facilities identified by the Agency pursuant to Articles 2(b) and 39(b) (other than those facilities removed, pursuant to Article 34(b)(i) from the list provided for by Article 1(b)) and to transfer such material to a destination in the United States other than to a facility included in the list established and maintained pursuant to Articles 1(b) and 34, the United States shall notify the Agency in advance of such withdrawal. Nuclear material in respect of which such notification has been given shall cease to be subject to safeguards under this Agreement as from the time of its withdrawal.

(b) Nothing in this Agreement shall effect the right of the United States to transfer material subject to safeguards under this Agreement to destinations not within or under the jurisdiction of the United States. The United States shall provide the Agency with information with respect to such transfers in accordance with Article 89. The Agency shall keep records of each such transfer and, where applicable, of the re-application of safeguards to the transferred nuclear material.

Article 13

Where nuclear material subject to safeguards under this Agreement is to be used in non-nuclear activities, such as the produc-

tion of alloys or ceramics, the United States shall agree with the Agency, before the material is so used, on the circumstances under which the safeguards on such material may be terminated.

Article 14

The United States and the Agency will bear the expenses incurred by them in implementing their respective responsibilities under this Agreement. However if, the United States or persons under its jurisdiction incur extraordinary expenses as a result of a specific request by the Agency, the Agency shall reimburse such expenses provided that it has agreed in advance to do so. In any case the Agency shall bear the cost of any additional measuring or sampling which inspectors may request.

Article 15

In carrying out its functions under this Agreement within the United States, the Agency and its personnel shall be covered to the same extent as nationals of the United States by any protection against third-party liability provided under the Price-Anderson Act, including insurance or other indemnity coverage that may be required by the Price-Anderson Act with respect to nuclear incidents.

Article 16

Any claim by the United States against the Agency or by the Agency against the United States in respect of any damage resulting from the implementation of safeguards under this Agreement, other than damage arising out of a nuclear incident, shall be settled in accordance with international law.

Article 17

If the Board, upon report of the Director General, decides that an action by the United States is essential and urgent in order to ensure compliance with this Agreement, the Board may call upon the United States to take the required action without delay, irrespective of whether procedures have been invoked pursuant to Article 21 for the settlement of a dispute.

Article 18

If the Board, upon examination of relevant information reported to it by the Director General, determines there has been any non-compliance with this Agreement, the Board may call upon the United States to remedy forthwith such non-compliance. In the event there is a failure to take fully corrective action within a reasonable time, the Board may make the reports provided for in paragraph C of Article XII of the Statute and may also take, where applicable, the other measures provided for in that paragraph. In taking such action the Board shall take account of the degree of assurance provided by the safeguards measures that have been applied and shall afford the United States every reasonable opportunity to furnish the Board with any necessary reassurance.

Article 19

The United States and the Agency shall, at the request of either, consult about any question arising out of the interpretation or application of this Agreement.

Article 20

The United States shall have the right to request that any question arising out of the interpretation or application of this Agreement be considered by the Board. The Board shall invite the United States to participate in the discussion of any such question by the Board.

Article 21

Any dispute arising out of the interpretation or application of this Agreement, except a dispute with regard to a determination by the Board under Article 18 or an action taken by the Board pursuant to such a determination which is not settled by negotiation or another procedure agreed to by the United States and the Agency shall, at the request of either, be submitted to an arbitral tribunal composed as follows: The United States and the Agency shall each designate one arbitrator, and the two arbitrators so designated shall elect a third, who shall be the Chairman. If, within thirty days of the request for arbitration, either the United States or the Agency has not designated an arbitrator, either the United States or the Agency may request the President of the International Court of Justice to appoint an arbitrator. The same procedure shall apply if, within thirty days of the designation or appointment of the second arbitrator, the third arbitrator has not been elected. A majority of the members of the arbitral tribunal shall constitute a quorum, and all decisions shall require the concurrence of two arbitrators. The arbitral procedure shall be fixed by the tribunal. The decisions of the tribunal shall be binding on the United States and the Agency.

Article 22

The Parties shall institute steps to suspend the application of Agency safeguards in the United States under other safeguards agreements with the Agency while this Agreement is in force. However, the United States and the Agency shall ensure that nuclear material being safeguarded under this Agreement shall be at all times at least equivalent in amount and composition to that which would be subject to safeguards in the United States under the agreements in question. The detailed arrangements for the implementation of this provision shall be specified in the subsidiary arrangements provided for in Article 39, and shall reflect the nature of any undertaking given under such other safeguards agreements.

Article 23

(a) The United States and the Agency shall, at the request of either, consult each other on amendments to this Agreement.

(b) All amendments shall require the agreement of the United States and the Agency.

Article 24

This Agreement or any amendments thereto shall enter into force on the date on which the Agency receives from the United States written notification that statutory and constitutional requirements of the United States for entry into force have been met.

Article 25

The Director General shall promptly inform all Member States of the Agency of the entry into force of this Agreement, or of any amendments thereto.

Article 26

The Agreement shall remain in force as long as the United States is a party to the Treaty except that the Parties to this Agreement shall, upon the request of either of them, consult and, to the extent mutually agreed, modify this Agreement in order to ensure that it continues to serve the purpose for which it was originally intended. If the Parties are unable after such consultation to agree upon necessary modifications, either Party may, upon six months' notice, terminate this Agreement.

PART II

Article 27

The purpose of this part of the Agreement is to specify the procedures to be applied in the implementation of the safeguards provisions of Part I.

Article 28

The objective of the safeguards procedures set forth in this part of the Agreement is the timely detection of withdrawal, other than in accordance with the terms of this Agreement, of significant quantities of nuclear material from activities in facilities while such material is being safeguarded under this Agreement.

Article 29

For the purpose of achieving the objective set forth in Article 28, material accountancy shall be used as a safeguards measure of fundamental importance, with containment and surveillance as important complementary measures.

Article 30

The technical conclusion of the Agency's verification activities shall be a statement, in respect of each material balance area, of the amount of material unaccounted for over a specific period, and giving the limits of accuracy of the amounts stated.

Article 31

Pursuant to Article 7, the Agency, in carrying out its verification activities, shall make full use of the United States' system of account-

ing for and control of all nuclear material subject to safeguards under this Agreement and shall avoid unnecessary duplication of the United States' accounting and control activities.

Article 32

The United States' system of accounting for and control of all nuclear material subject to safeguards under this Agreement shall be based on a structure of material balance areas, and shall make provision, as appropriate and specified in the Subsidiary Arrangements, for the establishment of such measures as:

(a) A measurement system for the determination of the quantities of nuclear material received, produced, shipped, lost or otherwise removed from inventory, and the quantities on inventory;

(b) The evaluation of precision and accuracy of measurements and the estimation of measurement uncertainty;

(c) Procedures for identifying, reviewing and evaluating differences in shipper/receiver measurements;

(d) Procedures for taking a physical inventory;

(e) Procedures for the evaluation of accumulations of unmeasured inventory and unmeasured losses;

(f) A system of records and reports showing, for each material balance area, the inventory of nuclear material and the changes in that inventory including receipts into and transfers out of the material balance area;

(g) Provisions to ensure that the accounting procedures and arrangements are being operated correctly; and

(h) Procedures for the provision of reports to the Agency in accordance with Articles 57 through 63 and 65 through 67.

Article 33

Safeguards under this Agreement shall not apply to material in mining or ore processing activities.

Article 34

The United States may, at any time, notify the Agency of any facility or facilities to be added to or removed from the list provided for in Article 1(b):

(a) In case of addition to the list, the notification shall specify the facility or facilities to be added to the list and the date upon which the addition is to take effect;

(b) In the case of removal from the list of a facility or facilities then currently identified pursuant to Articles 2(b) or 39(b):

(i) The Agency shall be notified in advance and the notification shall specify: the facility or facilities being removed, the date of removal, and the quantity and composition of the nuclear material contained therein at the time of notification. In exceptional circumstances, the United States may remove facilities without giving advance notification;

(ii) Any facility in respect of which notification has been given in accordance with sub-paragraph (i) shall be removed from the list and nuclear material contained therein shall cease to be subject to safeguards under this Agreement in accordance with and at the time specified in the notification by the United States.

(c) In the case of removal from the list of a facility or facilities not then currently identified pursuant to Articles 2(b) or 39(b), the notification shall specify the facility or facilities being removed and the date of removal. Such facility or facilities shall be removed from the list at the time specified in the notification by the United States.

Article 35

(a) Safeguards shall terminate on nuclear material subject to safeguards under this Agreement, under the conditions set forth in Article 11. Where the conditions of that Article are not met, but the United States considers that the recovery of safeguarded nuclear material from residues is not for the time being practicable or desirable, the United States and the Agency shall consult on the appropriate safeguards measures to be applied.

(b) Safeguards shall terminate on nuclear material subject to safeguards under this Agreement, under the conditions set forth in Article 13, provided that the United States and the Agency agree that such nuclear material is practicably irrecoverable.

Article 36

At the request of the United States, the Agency shall exempt from safeguards nuclear material, which would otherwise be subject to safeguards under this Agreement, as follows:

(a) Special fissionable material, when it is used in gram quantities or less as a sensing component in instruments;

(b) Nuclear material, when it is used in non-nuclear activities in accordance with Article 13, if such nuclear material is recoverable; and

(c) Plutonium with an isotopic concentration of plutonium-238 exceeding 80%.

Article 37

At the request of the United States, the Agency shall exempt from safeguards nuclear material that would otherwise be subject to safeguards under this Agreement, provided that the total quantity of nuclear material which has been exempted in the United States in accordance with this Article may not at any time exceed:

(a) One kilogram in total of special fissionable material, which may consist of one or more of the following;

(i) Plutonium;

(ii) Uranium with an enrichment of 0.2 (20%) and above, taken account of by multiplying its weight by its enrichment; and

(iii) Uranium with an enrichment below 0.2 (20%) and above that of natural uranium, taken account of by multi-

plying its weight by five times the square of its enrichment;
 (b) Ten metric tons in total of natural uranium and depleted uranium with an enrichment above 0.005 (0.5%);
 (c) Twenty metric tons of depleted uranium with an enrichment of 0.005 (0.5%) or below; and
 (d) Twenty metric tons of thorium;
 or such greater amounts as may be specified by the Board for uniform application.

Article 38

If exempted nuclear material is to be processed or stored together with nuclear material subject to safeguards under this Agreement, provision shall be made for the re-application of safeguards thereto.

Article 39

(a) The United States and the Agency shall make Subsidiary Arrangements which shall:

(i) contain a current listing of those facilities identified by the Agency pursuant to Article 2(b) and thus containing nuclear material subject to safeguards under this Agreement; and

(ii) specify in detail, to the extent necessary to permit the Agency to fulfill its responsibilities under this Agreement in an effective and efficient manner, how the procedures laid down in this Agreement are to be applied.

(b) (i) After entry into force of this Agreement, the Agency shall identify to the United States, from the list provided in accordance with Article 1(b), those facilities to be included in the initial Subsidiary Arrangements listing;

(ii) The Agency may thereafter identify for inclusion in the Subsidiary Arrangements listing additional facilities from the list provided in accordance with Article 1(b) as that list may have been modified in accordance with Article 34.

(c) The Agency shall also designate to the United States those facilities to be removed from the Subsidiary Arrangements listing which have not otherwise been removed pursuant to notification by the United States in accordance with Article 34. Such facility or facilities shall be removed from the Subsidiary Arrangements listing upon such designation to the United States.

(d) The Subsidiary Arrangements may be extended or charged by agreement between the Agency and the United States without amendment of this Agreement.

Article 40

(a) With respect to those facilities which shall have been identified by the Agency in accordance with Article 39(b)(i), such Subsidiary Arrangements shall enter into force at the same time as, or as soon as possible after, entry into force of this Agreement. The United States and the Agency shall make every effort to achieve their entry into force within 90 days after entry into force of this Agreement; an extension of that period shall require agreement between the United States and the Agency.

(b) With respect to facilities which, after the entry into force of this Agreement, have been identified by the Agency in accordance with Ar-

Article 39(b) (ii) for inclusion in the Subsidiary Arrangements listing, the United States and the Agency shall make every effort to achieve the entry into force of such Subsidiary Arrangements within ninety days following such identification to the United States; an extension of that period shall require agreement between the Agency and the United States.

(c) Upon identification of a facility by the Agency in accordance with Article 39(b), the United States shall provide the Agency promptly with the information required for completing the Subsidiary Arrangements, and the Agency shall have the right to apply the procedures set forth in this Agreement to the nuclear material listed in the inventory provided for in Article 41, even if the Subsidiary Arrangements have not yet entered into force.

Article 41

The Agency shall establish, on the basis of the initial reports referred to in Article 60(a) below, a unified inventory of all nuclear material in the United States subject to safeguards under this Agreement, irrespective of its origin, and shall maintain this inventory on the basis of subsequent reports concerning those facilities, of the initial reports referred to in Article 60(b), of subsequent reports concerning the facilities listed pursuant to Article 39(b) (ii), and of the results of its verification activities. Copies of the inventory shall be made available to the United States at intervals to be agreed.

Article 42

Pursuant to Article 8, design information in respect of facilities identified by the Agency in accordance with Article 39(b) (i) shall be provided to the Agency during the discussion of the Subsidiary Arrangements. The time limits for the provision of design information in respect of any facility which is identified by the Agency in accordance with Article 39(b) (ii) shall be specified in the Subsidiary Arrangements and such information shall be provided as early as possible after such identification.

Article 43

The design information to be provided to the Agency shall include, in respect of each facility identified by the Agency in accordance with Article 39(b), when applicable:

(a) The identification of the facility, stating its general character, purpose, nominal capacity and geographic location, and the name and address to be used for routine business purposes;

(b) A description of the general arrangement of the facility with reference, to the extent feasible, to the form, location and flow of nuclear material and to the general layout of important items of equipment which use, produce or process nuclear material;

(c) A description of features of the facility relating to material accountancy, containment and surveillance; and

(d) A description of the existing and proposed procedures at the facility for nuclear material accountancy and control, with special reference to material balance areas established by the

operator, measurements of flow and procedures for physical inventory taking.

Article 44

Other information relevant to the application of safeguards shall also be provided to the Agency in respect of each facility identified by the Agency in accordance with Article 39(b), in particular on organizational responsibility for material accountancy and control. The United States shall provide the Agency with supplementary information on the health and safety procedures which the Agency shall observe and with which the inspectors shall comply at the facility.

Article 45

The Agency shall be provided with design information in respect of a modification relevant for safeguards purposes, for examination, and shall be informed of any change in the information provided to it under Article 44, sufficiently in advance for the safeguards procedures to be adjusted when necessary.

Article 46

The design information provided to the Agency shall be used for the following purposes:

(a) To identify the features of facilities and nuclear material relevant to the application of safeguards to nuclear material in sufficient detail to facilitate verification;

(b) To determine material balance areas to be used for Agency accounting purposes and to select those strategic points which are key measurement points and which will be used to determine flow and inventory of nuclear material; in determining such material balance areas the Agency shall, *inter alia*, use the following criteria:

(i) The size of the material balance area shall be related to the accuracy with which the material balance can be established;

(ii) In determining the material balance area, advantage shall be taken of any opportunity to use containment and surveillance to help ensure the completeness of flow measurements and thereby to simplify the application of safeguards and to concentrate measurement efforts at key measurement points;

(iii) A number of material balance areas in use at a facility or at distinct sites may be combined in one material balance area to be used for Agency accounting purposes when the Agency determines that this is consistent with its verification requirements; and

(iv) A special material balance area may be established at the request of the United States around a process step involving commercially sensitive information;

(c) To establish the nominal timing and procedures for taking of physical inventory of nuclear material for Agency accounting purposes;

(d) To establish the records and reports requirements and records evaluation procedures;

(e) To establish requirements and procedures for verification of the quantity and location of nuclear material; and

(f) To select appropriate combinations of containment and surveillance methods and techniques at the strategic points at which they are to be applied.

The results of the examination of the design information shall be included in the Subsidiary Arrangements.

Article 47

Design information shall be re-examined in the light of changes in operating conditions, of developments in safeguards technology or of experience in the application of verification procedures, with a view to modifying the action the Agency has taken pursuant to Article 46.

Article 48

The Agency, in co-operation with the United States, may send inspectors to facilities to verify the design information provided to the Agency pursuant to Articles 42 through 45, for the purposes stated in Article 46.

Article 49

In establishing a national system of materials control as referred to in Article 7, the United States shall arrange that records are kept in respect of each material balance area determined in accordance with Article 46(b). The records to be kept shall be described in the Subsidiary Arrangements.

Article 50

The United States shall make arrangements to facilitate the examination of records referred to in Article 49 by inspectors.

Article 51

Records referred to in Article 49 shall be retained for at least five years.

Article 52

Records referred to in Article 49 shall consist, as appropriate, of:

(a) Accounting records of all nuclear material subject to safeguards under this Agreement; and

(b) Operating records for facilities containing such nuclear material.

Article 53

The system of measurements on which the records used for the preparation of reports are based shall either conform to the latest international standards or be equivalent in quality to such standards.

Article 54

The accounting records referred to in Article 52(a) shall set forth the following in respect of each material balance area determined in accordance with Article 46(b):

- (a) All inventory changes, so as to permit a determination of the book inventory at any time;
- (b) All measurement results that are used for determination of the physical inventory; and
- (c) All adjustments and corrections that have been made in respect of inventory changes, book inventories and physical inventories.

Article 55

For all inventory changes and physical inventories the records referred to in Article 52(a) shall show, in respect of each batch of nuclear material: material identification, batch data and source data. The records shall account for uranium, thorium and plutonium separately in each batch of nuclear material. For each inventory change, the data of the inventory change and, when appropriate, the originating material balance area and the receiving material balance area or the recipient shall be indicated.

Article 56

The operating records referred to in Article 52(b) shall set forth, as appropriate, in respect of each material balance area determined in accordance with Article 46(b):

- (a) Those operating data which are used to establish changes in the quantities and composition of nuclear material;
- (b) The data obtained from the calibration of tanks and instruments and from sampling and analyses, the procedures to control the quality of measurements and the derived estimates of random and systematic error;
- (c) A description of the sequence of the actions taken in preparing for, and in taking a physical inventory, in order to ensure that it is correct and complete; and
- (d) A description of the actions taken in order to ascertain the cause and magnitude of any accidental or unmeasured loss that might occur.

Article 57

The United States shall provide the Agency with reports as detailed in Articles 58 through 67 in respect of nuclear material subject to safeguards under this Agreement.

Article 58

Reports shall be made in English.

Article 59

Reports shall be based on the records kept in accordance with Articles 49 through 56 and shall consist, as appropriate, of accounting reports and special reports.

Article 60

The United States shall provide the Agency with an initial report on all nuclear material contained in each facility which becomes listed in the Subsidiary Arrangements in accordance with Article 39(b) :

(a) With respect to those facilities listed pursuant to Article 39(b) (i), such reports shall be dispatched to the Agency within thirty days of the last day of the calendar month in which this Agreement enters into force, and shall reflect the situation as of the last day of that month.

(b) With respect to each facility listed pursuant to Article 39(b) (ii), an initial report shall be dispatched to the Agency within thirty days of the last day of the calendar month in which the Agency identifies the facility to the United States and shall reflect the situation as of the last day of that month.

Article 61

The United States shall provide the Agency with the following accounting reports for each material balance area determined in accordance with Article 46(b) :

(a) Inventory change reports showing all changes in the inventory of nuclear material. The reports shall be dispatched as soon as possible and in any event within thirty days after the end of the month in which the inventory changes occurred or were established; and

(b) Material balance reports showing the material balance based on a physical inventory of nuclear material actually present in the material balance area. The reports shall be dispatched as soon as possible and in any event within thirty days after the physical inventory has been taken.

The reports shall be based on data available as of the date of reporting and may be corrected at a later date, as required.

Article 62

Inventory change reports submitted in accordance with Article 61 (a) shall specify identification and batch data for each batch of nuclear material, the date of the inventory change, and, as appropriate, the originating material balance area and the receiving material balance area or the recipient. These reports shall be accompanied by concise notes :

(a) Explaining the inventory changes, on the basis of the operating data contained in the operating records provided for under Article 56(a) ; and

(b) Describing, as specified in the Subsidiary Arrangements, the anticipated operational programme, particularly the taking of a physical inventory.

Article 63

The United States shall report each inventory change, adjustment and correction, either periodically in a consolidated list or individually. Inventory changes shall be reported in terms of batches. As specified

in the Subsidiary Arrangements, small changes in inventory of nuclear material, such as transfers of analytical samples, may be combined in one batch and reported as one inventory change.

Article 64

The Agency shall provide the United States with semi-annual statements of book inventory of nuclear material subject to safeguards under this Agreement, for each material balance area, as based on the inventory change reports for the period covered by each such statement.

Article 65

Material balance reports submitted in accordance with Article 61 (b) shall include the following entries, unless otherwise agreed by the United States and the Agency:

- (a) Beginning physical inventory;
- (b) Inventory changes (first increases, then decreases);
- (c) Ending book inventory;
- (d) Shipper/receiver differences;
- (e) Adjusted ending book inventory;
- (f) Ending physical inventory; and
- (g) Material unaccounted for.

A statement of the physical inventory, listing all batches separately and specifying material identification and batch data for each batch, shall be attached to each material balance report.

Article 66

The United States shall make special reports without delay:

(a) If any unusual incident or circumstances lead the United States to believe that there is or may have been loss of nuclear material subject to safeguards under this Agreement that exceeds the limits specified for this purpose in the Subsidiary Arrangements; or

(b) If the containment has unexpectedly changed from that specified in the Subsidiary Arrangements to the extent that unauthorized removal of nuclear material subject to safeguards under this Agreement has become possible.

Article 67

If the Agency so requests, the United States shall provide it with amplifications or clarifications of any report submitted in accordance with Articles 57 through 63, 65 and 66, in so far as relevant for the purpose of safeguards.

Article 68

The Agency shall have the right to make inspections as provided for in Articles 69 through 82.

Article 69

The Agency may make ad hoc inspections in order to:

- (a) Verify the information contained in the initial reports submitted in accordance with Article 60;

(b) Identify and verify changes in the situation which have occurred since the date of the relevant initial report; and

(c) Identify and if possible verify the quantity and composition of the nuclear material subject to safeguards under this Agreement in respect of which the information referred to in Article 89(a) has been provided to the Agency.

Article 70

The Agency may make routine inspections in order to:

(a) Verify that reports submitted pursuant to Articles 57 through 63, 65 and 66 are consistent with records kept pursuant to Articles 49 through 56;

(b) Verify the location, identity, quantity and composition of all nuclear material subject to safeguards under this Agreement; and

(c) Verify information on the possible causes of material unaccounted for, shipper/receiver differences and uncertainties in the book inventory.

Article 71

Subject to the procedures laid down in Article 75, the Agency may make special inspections:

(a) In order to verify the information contained in special reports submitted in accordance with Article 66; or

(b) If the Agency considers that information made available by the United States, including explanations from the United States and information obtained from routine inspections, is not adequate for the Agency to fulfill its responsibilities under this Agreement.

An inspection shall be deemed to be special when it is either additional to the routine inspection effort provided for in Articles 76 through 80, or involves access to information or locations in addition to the access specified in Article 74 for ad hoc and routine inspections, or both.

Article 72

For the purposes specified in Articles 69 through 71, the Agency may:

(a) Examine the records kept pursuant to Articles 49 through 56;

(b) Make independent measurements of all nuclear material subject to safeguards under this Agreement;

(c) Verify the functioning and calibration of instruments and other measuring and control equipment;

(d) Apply and make use of surveillance and containment measures; and

(e) Use other objective methods which have been demonstrated to be technically feasible.

Article 73

Within the scope of Article 72, the Agency shall be enabled:

(a) To observe that samples at key measurement points for material balance accountancy are taken in accordance with procedures which produce representative samples, to observe the treatment and analysis of the samples and to obtain duplicates of such samples;

(b) To observe that the measurements of nuclear material at key measurement points for material balance accountancy are representative, and to observe the calibration of the instruments and equipment involved;

(c) To make arrangements with the United States that, if necessary:

(i) Additional measurements are made and additional samples taken for the Agency's use;

(ii) The Agency's standard analytical samples are analysed;

(iii) Appropriate absolute standards are used in calibrating instruments and other equipment; and

(iv) Other calibrations are carried out;

(d) To arrange to use its own equipment for independent measurement and surveillance, and if so agreed and specified in the Subsidiary Arrangements to arrange to install such equipment;

(e) To apply its seals and other identifying and tamper-indicating devices to containments, if so agreed and specified in the Subsidiary Arrangements; and

(f) To make arrangements with the United States for the shipping of samples taken for the Agency's use.

Article 74

(a) For the purposes specified in Article 69(a) and (b) and until such time as the strategic points have been specified in the Subsidiary Arrangements, Agency inspectors shall have access to any location where the initial report or any inspections carried out therewith indicate that nuclear material subject to safeguards under this Agreement is present.

(b) For the purposes specified in Article 69(c), the inspectors shall have access to any facility identified pursuant to Articles 2(b) or 39 (b) in which nuclear material referred to in Article 69(c) is located.

(c) For the purposes specified in Article 70 the inspectors shall have access only to the strategic points specified in the Subsidiary Arrangements and to the records maintained pursuant to Articles 49 through 56; and

(d) In the event of the United States concluding that any unusual circumstances require extended limitations on access by the Agency, the United States and the Agency shall promptly make arrangements

with a view to enabling the Agency to discharge its safeguards responsibilities in the light of these limitations. The Director General shall report each such arrangement to the Board.

Article 75

In circumstances which may lead to special inspections for the purposes specified in Article 71 the United States and the Agency shall consult forthwith. As a result of such consultations the Agency may:

(a) Make inspections in addition to the routine inspection effort provided for in Articles 76 through 80; and

(b) Obtain access, in agreement with the United States, to information or locations in addition to those specified in Article 74. Any disagreement concerning the need for additional access shall be resolved in accordance with Articles 20 and 21; in case action by the United States is essential and urgent, Article 17 shall apply.

Article 76

The Agency shall keep the number, intensity and duration of routine inspections, applying optimum timing, to the minimum consistent with the effective implementation of the safeguards procedures set forth in this Agreement, and shall make the optimum and most economical use of inspection resources available to it.

Article 77

The Agency may carry out one routine inspection per year in respect of facilities listed in the Subsidiary Arrangements pursuant to Article 39 with a content or annual throughput, whichever is greater, of nuclear material not exceeding five effective kilograms.

Article 78

The number, intensity, duration, timing and mode of routine inspections in respect of facilities listed in the Subsidiary Arrangements pursuant to Article 39 with a content or annual throughput of nuclear material exceeding five effective kilograms shall be determined on the basis that in the maximum or limiting case the inspection regime shall be no more intensive than is necessary and sufficient to maintain continuity of knowledge of the flow and inventory of nuclear material, and the maximum routine inspection effort in respect of such facilities shall be determined as follows:

(a) For reactors and sealed storage installations the maximum total of routine inspection per year shall be determined by allowing one sixth of a man-year of inspection for each such facility.

(b) For facilities, other than reactors or sealed storage installations, involving plutonium or uranium enriched to more than 5 percent, the maximum total of routine inspection per year shall be determined by allowing for each such facility $30 \times \sqrt{E}$ man-days of inspection per year, where E is the inventory or annual throughput of nuclear material, whichever is greater, expressed in effective kilograms. The maximum established for any such facil-

ity shall not, however, be less than 1.5 man-years of inspection; and

(c) For facilities not covered by paragraphs (a) or (b), the maximum total of routine inspection per year shall be determined by allowing for each such facility one third of a man-year of inspection plus $0.4 \times E$ man-days of inspection per year, where E is the inventory or annual throughput of nuclear material, whichever is greater, expressed in effective kilograms.

The United States and the Agency may agree to amend the figures for the maximum inspection effort specified in this Article, upon determination by the Board that such amendment is reasonable.

Article 79

Subject to Articles 76 through 78 the criteria to be used for determining the actual number, intensity, duration, timing and mode of routine inspections in respect of any facility listed in the Subsidiary Arrangements pursuant to Article 39 shall include:

(a) The form of the nuclear material, in particular, whether the nuclear material is in bulk form or contained in a number of separate items; its chemical composition and, in the case of uranium, whether it is of low or high enrichment; and its accessibility;

(b) The effectiveness of the United States' accounting and control system, including the extent to which the operators of facilities are functionally independent of the United States' accounting and control system; the extent to which the measures specified in Article 32 have been implemented by the United States; the promptness of reports provided to the Agency; their consistency with the Agency's independent verification; and the amount and accuracy of the material unaccounted for, as verified by the Agency;

(c) Characteristics of that part of the United States fuel cycle in which safeguards are applied under this Agreement, in particular, the number and types of facilities containing nuclear material subject to safeguards under this Agreement, the characteristics of such facilities relevant to safeguards, notably the degree of containment; the extent to which the design of such facilities facilitates verification of the flow and inventory of nuclear material; and the extent to which information from different material balance areas can be correlated;

(d) International interdependence; in particular the extent to which nuclear material, safeguarded under this Agreement, is received from or sent to other States for use or processing; any verification activities by the Agency in connection therewith; and the extent to which activities in facilities in which safeguards are applied under this Agreement are interrelated with those of other States; and

(e) Technical developments in the field of safeguards, including the use of statistical techniques and random sampling in evaluating the flow of nuclear material.

Article 80

The United States and the Agency shall consult if the United States considers that the inspection effort is being deployed with undue concentration on particular facilities.

Article 81

The Agency shall give advance notice to the United States of the arrival of inspectors at facilities listed in the Subsidiary Arrangements pursuant to Article 39, as follows:

(a) For ad hoc inspections pursuant to Article 69(c), at least 24 hours; for those pursuant to Article 69 (a) and (b), as well as the activities provided for in Article 48, at least one week;

(b) For special inspections pursuant to Article 71, as promptly as possible after the United States and the Agency have consulted as provided for in Article 75, it being understood that notification of arrival normally will constitute part of the consultations; and

(c) For routine inspections pursuant to Article 70 at least twenty-four hours in respect of the facilities referred to in Article 78(b) and sealed storage installations containing plutonium or uranium enriched to more than 5 percent and one week in all other cases.

Such notice of inspections shall include the names of the inspectors and shall indicate the facilities to be visited and the periods during which they will be visited. If the inspectors are to arrive from outside the United States the Agency shall also give advance notice of the place and time of their arrival in the United States.

Article 82

Notwithstanding the provisions of Article 81, the Agency may, as a supplementary measure, carry out without advance notification a portion of the routine inspections pursuant to Article 78 in accordance with the principle of random sampling. In performing any unannounced inspections, the Agency shall fully take into account any operational programme provided by the United States pursuant to Article 62(b). Moreover, whenever practicable, and on the basis of the operational programme, it shall advise the United States periodically of its general programme of announced and unannounced inspections, specifying the general periods when inspections are foreseen. In carrying out any unannounced inspections, the Agency shall make every effort to minimize any practical difficulties for the United States and facility operators bearing in mind the relevant provisions of Articles 44 and 87. Similarly the United States shall make every effort to facilitate the task of the inspectors.

Article 83

The following procedures shall apply to the designation of inspectors:

(a) The Director General shall inform the United States in writing of the name, qualifications, nationality, grade and such other particulars as may be relevant, of each Agency official he proposes for designation as an inspector for the United States;

(b) The United States shall inform the Director General within thirty days of the receipt of such a proposal whether it accepts the proposal;

(c) The Director General may designate each official who has been accepted by the United States as one of the inspectors for the

United States, and shall inform the United States of such designations; and

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

However, in respect of inspectors needed for the activities provided for in Article 48 and to carry out ad hoc inspections pursuant to Article 69 (a) and (b) the designation procedures shall be completed if possible within thirty days after the entry into force of this Agreement. If such designation appears impossible within this time limit, inspectors for such purposes shall be designated on a temporary basis.

Article 84

The United States shall grant or renew as quickly as possible appropriate visas, where required, for each inspector designated for United States.

Article 85

Inspectors, in exercising their functions under Articles 48 and 69 to 73, shall carry out their activities in a manner designed to avoid hampering or delaying the construction, commissioning or operation of facilities, or affecting their safety. In particular inspectors shall not operate any facility themselves or direct the staff of a facility to carry out any operation. If inspectors consider that in pursuance of paragraphs 72 and 73, particular operations in a facility should be carried out by the operator, they shall make a request therefor.

Article 86

When inspectors require services available in the United States, including the use of equipment, in connection with the performance of inspections, the United States shall facilitate the procurement of such services and the use of such equipment by inspectors.

Article 87

The United States shall have the right to have inspectors accompanied during their inspections by its representatives, provided that inspectors shall not thereby be delayed or otherwise impeded in the exercise of their functions.

Article 88

The Agency shall inform the United States of:

(a) The results of inspections, at intervals to be specified in the Subsidiary Arrangements; and

(b) The conclusions it has drawn from its verification activities in the United States, in particular by means of statements in respect of each material balance area determined in accordance with Article 46(b) which shall be made as soon as possible after a physical inventory has been taken and verified by the Agency and a material balance has been struck.

Article 89

(a) Information concerning nuclear material exported from and imported into the United States shall be provided to the Agency in accordance with arrangements made with the Agency as, for example, those set forth in INFCIRC/207.

(b) In the case of international transfers to or from facilities identified by the Agency pursuant to Articles 2(b) and 39(b) with respect to which information has been provided to the Agency in accordance with arrangements referred to in paragraph (a), a special report, as envisaged in Article 66, shall be made if any unusual incident or circumstances lead the United States to believe that there is or may have been loss of nuclear material, including the occurrence of significant delay, during the transfer.

DEFINITIONS

Article 90

For the purposes of this Agreement:

A Adjustment means an entry into an accounting record or a report showing a shipper/receiver difference or material unaccounted for.

B Annual throughput means, for the purposes of Articles 77 and 78, the amount of nuclear material transferred annually out of a facility working at nominal capacity.

C Batch means a portion of nuclear material handled as a unit for accounting purposes at a key measurement point and for which the composition and quantity are defined by a single set of specifications or measurements. The nuclear material may be in bulk form or contained in a number of separate items.

D Batch data means the total weight of each element of nuclear material and, in the case of plutonium and uranium, the isotopic composition when appropriate. The units of account shall be as follows:

- (a) Grams of contained plutonium;
- (b) Grams of total uranium and grams of contained uranium-235 plus uranium-233 for uranium enriched in these isotopes; and
- (c) Kilograms of contained thorium, natural uranium or depleted uranium.

For reporting purposes the weights of individual items in the batch shall be added together before rounding to the nearest unit.

E Book inventory of a material balance area means the algebraic sum of the most recent physical inventory of that material balance area and of all inventory changes that have occurred since that physical inventory was taken.

F Correction means an entry into an accounting record or a report to rectify an identified mistake or to reflect an improved measurement of a quantity previously entered into the record or report. Each correction must identify the entry to which it pertains.

G Effective kilogram means a special unit used in safeguarding nuclear material. The quantity in effective kilograms is obtained by taking:

- (a) For plutonium, its weight in kilograms;
- (b) For uranium with an enrichment of 0.01 (1 percent) and above, its weight in kilograms multiplied by the square of its enrichment;
- (c) For uranium with an enrichment below 0.01 (1 percent) and above 0.005 (0.5 percent), its weight in kilograms multiplied by 0.0001; and
- (d) For depleted uranium with an enrichment of 0.005 (0.5 percent) or below, and for thorium, its weight in kilograms multiplied by 0.00005.

H Enrichment means the ratio of the combined weight of the isotopes uranium-233 and uranium-235 to that of the total uranium in question.

I Facility means:

- (a) A reactor, a critical facility, a conversion plant, a fabrication plant, a reprocessing plant, an isotope separation plant or a separate storage installation; or
- (b) Any location where nuclear material in amounts greater than one effective kilogram is customarily used.

J inventory change means an increase or decrease, in terms of batches, of nuclear material in a material balance area; such a change shall involve one of the following:

- (a) Increases:
 - (i) Import;
 - (ii) Domestic receipt: receipts from other material balance areas, receipts from a non-safeguarded activity or receipts at the starting point of safeguards;
 - (iii) Nuclear production: production of special fissionable material in a reactor; and
 - (iv) De-exemption: reapplication of safeguards on nuclear material previously exempted therefrom on account of its use or quantity.
- (b) Decreases:
 - (i) Export;
 - (ii) Domestic shipment: shipments to other material balance areas or shipments for a non-safeguarded activity;
 - (iii) Nuclear loss: loss of nuclear material due to its transformation into other element(s) or isotope(s) as a result of nuclear reactions;
 - (iv) Measured discard: nuclear material which has been measured, or estimated on the basis of measurements, and disposed of in such a way that it is not suitable for further nuclear use;
 - (v) Retained waste: nuclear material generated from processing or from an operational accident, which is deemed to be unrecoverable for the time being but which is stored;
 - (vi) Exemption: exemption of nuclear material from safeguards on account of its use or quantity; and
 - (vii) Other loss: for example, accidental loss (that is, irretrievable and inadvertent loss of nuclear material as the result of an operational accident) or theft.

K Key measurement point means a location where nuclear material appears in such a form that it may be measured to determine material flow or inventory. Key measurement points thus include, but are not limited to, the inputs and outputs (including measured discards) and storages in material balance areas.

L Man-year of inspection means, for the purposes of Article 78, 300 man-days of inspection, a man-day being a day during which a single inspector has access to a facility at any time for a total of not more than eight hours.

M Material balance area means an area in or outside of a facility such that:

(a) The quantity of nuclear material in each transfer into or out of each material balance area can be determined; and

(b) The physical inventory of nuclear material in each material balance area can be determined when necessary in accordance with specified procedures,

in order that the material balance for Agency safeguards purposes can be established.

N Material unaccounted for means the difference between book inventory and physical inventory.

O 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 after the entry into force of this Agreement which adds to the materials considered to be source material or special fissionable material shall have effect under this Agreement only upon acceptance by the United States.

P Physical inventory means the sum of all the measured or derived estimates of batch quantities of nuclear material on hand at a given time within a material balance area, obtained in accordance with specified procedures.

Q Shipper/receiver difference means the difference between the quantity of nuclear material in a batch as stated by the shipping material balance area and as measured at the receiving balance area.

R Source data means those data, recorded during measurement or calibration or used to derive empirical relationships, which identify nuclear material and provide batch data. Source data may include, for example, weight of compounds, conversion factors to determine weight of element, specific gravity, element concentration, isotopic ratios, relationship between volume and manometer readings and relationship between plutonium produced and power generated.

S Strategic point means a location selected during examination of design information where, under normal conditions and when combined with the information from all strategic points taken together, the information necessary and sufficient for the implementation of safeguards measures is obtained and verified; a strategic point may include any location where key measurements related to material balance accountancy are made and where containment and surveillance measures are executed.

PROTOCOL

Article 1

This Protocol specifies the procedures to be followed with respect to facilities identified by the Agency pursuant to Article 2 of this Protocol.

Article 2

(a) The Agency may from time to time identify to the United States those facilities included in the list, established and maintained pursuant to Articles 1(b) and 34 of the Agreement, of facilities not associated with activities having direct national security significance to the United States, other than those which are then currently identified by the Agency pursuant to Articles 2(b) and 39(b) of the Agreement, to which the provisions of this Protocol shall apply.

(b) The Agency may also include among the facilities identified to the United States pursuant to the foregoing paragraph, any facility which had previously been identified by the Agency pursuant to Articles 2(b) and 39(b) of the Agreement but which had subsequently been designated by the Agency pursuant to Article 39(c) of the Agreement for removal from the Subsidiary Arrangements listing.

(c) In identifying facilities pursuant to the foregoing paragraphs and in the preparation of Transitional Subsidiary Arrangements pursuant to Article 3 of this Protocol, the Agency shall proceed in a manner which the Agency and the United States mutually agree takes into account the requirement on the United States to avoid discriminatory treatment as between United States commercial firms similarly situated.

Article 3

The United States and the Agency shall make Transitional Subsidiary Arrangements which shall:

(a) contain a current listing of those facilities identified by the Agency pursuant to Article 2 of this Protocol;

(b) specify in detail how the procedures set forth in this Protocol are to be applied.

Article 4

(a) The United States and the Agency shall make every effort to complete the Transitional Subsidiary Arrangements with respect to each facility identified by the Agency pursuant to Article 2 of this Protocol within ninety days following such identification to the United States.

(b) With respect to any facility identified pursuant to Article 2(b) of this Protocol, the information previously submitted to the Agency in accordance with Articles 42 through 45 of the Agreement, the results of the examination of the design information and other provisions of the Subsidiary Arrangements relative to such facility, to the extent that such information, results and provisions satisfy the provisions of this Protocol relating to the submission and examination of information and the preparation of Transitional Subsidiary Arrangements, shall constitute the Transitional Subsidiary Arrangements for such facility, until and unless the United States and the Agency shall

otherwise complete Transitional Subsidiary Arrangements for such facility in accordance with the provisions of this Protocol.

Article 5

In the event that a facility currently identified by the Agency pursuant to Article 2(a) of this Protocol is identified by the Agency pursuant to Articles 2(b) and 39(b) of the Agreement, the Transitional Subsidiary Arrangements relevant to such facility shall, to the extent that such Transitional Subsidiary Arrangements satisfy the provisions of the Agreement, be deemed to have been made part of the Subsidiary Arrangements to the Agreement.

Article 6

Design information in respect of each facility identified by the Agency pursuant to Article 2 of this Protocol shall be provided to the Agency during the discussion of the relevant Transitional Subsidiary Arrangements. The information shall include, when applicable:

(a) The identification of the facility, stating its general character, purpose, nominal capacity and geographic location, and the name and address to be used for routine business purpose;

(b) A description of the general arrangement of the facility with reference, to the extent feasible, to the form, location and flow of nuclear material and to the general layout of important items of equipment which use, produce or process nuclear material;

(c) A description of features of the facility relating to material accountancy, containment and surveillance; and

(d) A description of the existing and proposed procedures at the facility for nuclear material accountancy and control, with special reference to material balance areas established by the operator, measurements of flow and procedures for physical inventory taking.

Article 7

Other information relevant to the application of the provisions of this Protocol shall also be provided to the Agency in respect of each facility identified by the Agency in accordance with Article 2 of this Protocol, in particular on organizational responsibility for material accountancy and control. The United States shall provide the Agency with supplementary information on the health and safety procedures which the Agency shall observe and with which inspectors shall comply when visiting the facility in accordance with Article 11 of this Protocol.

Article 8

The Agency shall be provided with design information in respect of a modification relevant to the application of the provisions of this Protocol, for examination, and shall be informed of any change in the information provided to it under Article 7 of this Protocol, sufficiently in advance for the procedures under this Protocol to be adjusted when necessary.

Article 9

The design information provided to the Agency in accordance with the provisions of this Protocol, in anticipation of the application of safeguards under the Agreement, shall be used for the following purposes:

(a) To identify the features of facilities and nuclear material relevant to the application of safeguards to nuclear material in sufficient detail to facilitate verification;

(b) To determine material balance areas to be used for Agency accounting purposes and to select those strategic points which are key measurement points and which will be used to determine flow and inventory of nuclear material; in determining such material balance areas the Agency shall, *inter alia*, use the following criteria;

(i) The size of the material balance area shall be related to the accuracy with which the material balance can be established;

(ii) In determining the material balance area, advantage shall be taken of any opportunity to use containment and surveillance to help ensure the completeness of flow measurements and thereby to simplify the application of safeguards and to concentrate measurement efforts at key measurement points;

(iii) A number of material balance areas in use at a facility or at distinct sites may be combined in one material balance area to be used for Agency accounting purposes when the Agency determines that this is consistent with its verification requirements; and

(iv) A special material balance area may be established at the request of the United States around a process step involving commercially sensitive information;

(c) To establish the nominal timing and procedures for taking of physical inventory of nuclear material for Agency accounting purposes;

(d) To establish the records and reports requirements and records evaluation procedures;

(e) To establish requirements and procedures for verification of the quantity and location of nuclear material; and

(f) To select appropriate combinations of containment and surveillance methods and techniques and the strategic points at which they are to be applied.

The results of the examination of the design information shall be included in the relevant Transitional Subsidiary Arrangements.

Article 10

Design information provided in accordance with the provisions of this Protocol shall be re-examined in the light of changes in operating conditions, of developments in safeguards technology or of experience in the application of verification procedures, with a view to modifying the action taken pursuant to Article 9 of this Protocol.

Article 11

(a) The Agency, in co-operation with the United States, may send inspectors to facilities identified by the Agency pursuant to Article 2

of this Protocol to verify the design information provided to the Agency in accordance with the provisions of this Protocol, for the purposes stated in Article 9 of this Protocol or for such other purposes as may be agreed between the United States and the Agency.

(b) The Agency shall give notice to the United States with respect to each such visit at least one week prior to the arrival of inspectors at the facility to be visited.

Article 12

In establishing a national system of materials control as referred to in Article 7(a) of the Agreement, the United States shall arrange that records are kept in respect of each material balance area determined in accordance with Article 9(b) of this Protocol. The records to be kept shall be described in the relevant Transitional Subsidiary Arrangements.

Article 13

Records referred to in Article 12 of this Protocol shall be retained for at least five years.

Article 14

Records referred to in Article 12 of this Protocol shall consist, as appropriate, of:

- (a) Accounting records of all nuclear material stored, processed, used or produced in each facility; and
- (b) Operating records for activities within each facility.

Article 15

The system of measurements on which the records used for the preparation of reports are based shall either conform to the latest international standards or be equivalent in quality to such standards.

Article 16

The accounting records referred to in Article 14(a) of this Protocol shall set forth the following in respect of each material balance area determined in accordance with Article 9(b) of this Protocol:

- (a) All inventory changes, so as to permit a determination of the book inventory at any time;
- (b) All measurement results that are used for determination of the physical inventory; and
- (c) All adjustments and corrections that have been made in respect of inventory changes, book inventories and physical inventories.

Article 17

For all inventory changes and physical inventories the records referred to in Article 14(a) of this Protocol shall show, in respect of each batch of nuclear material: material identification, batch data and source data. The records shall account for uranium, thorium and plutonium separately in each batch of nuclear material. For each inventory change, the date of the inventory change and, when appropriate, the originating material balance area and the receiving material balance area or the recipient, shall be indicated.

Article 18

The operating records referred to in Article 14(b) of this Protocol shall set forth, as appropriate, in respect of each material balance area determined in accordance with Article 9(b) of this Protocol:

(a) Those operating data which are used to establish changes in the quantities and composition of nuclear material;

(b) The data obtained from the calibration of tanks and instruments and from sampling and analyses, the procedures to control the quality of measurements and the derived estimates of random and systematic error;

(c) A description of the sequence of the actions taken in preparing for, and in taking, a physical inventory, in order to ensure that it is correct and complete; and

(d) A description of the actions taken in order to ascertain the cause and magnitude of any accidental or unmeasured loss that might occur.

Article 19

The United States shall provide the Agency with accounting reports as detailed in Articles 20 through 25 of this Protocol in respect of nuclear material in each facility identified by the Agency pursuant to Article 2 of this Protocol.

Article 20

The accounting reports shall be based on the records kept in accordance with Articles 12 to 18 to this Protocol. They shall be made in English.

Article 21

The United States shall provide the Agency with an initial report on all nuclear material in each facility identified by the Agency pursuant to Article 2 of this Protocol. Such report shall be dispatched to the Agency within thirty days of the last day of the Calendar month in which the facility is identified by the Agency and shall reflect the situation as of the last day of that month.

Article 22

The United States shall provide the Agency with the following accounting reports for each material balance area determined in accordance with Article 9(b) of this Protocol:

(a) Inventory change reports showing all changes in the inventory of nuclear material. The reports shall be dispatched as soon as possible and in any event within thirty days after the end of the month in which the inventory changes occurred or were established; and

(b) Material balance reports showing the material balance based on a physical inventory of nuclear material actually present in the material balance area. The reports shall be dispatched as soon as possible and in any event within thirty days after the physical inventory has been taken.

The reports shall be based on data available as of the date of reporting and may be corrected at a later date, as required.

Article 23

Inventory change reports submitted in accordance with Article 22(a) of this Protocol shall specify identification and batch data for each batch of nuclear material, the date of the inventory change, and, as appropriate, the originating material balance area and the receiving material balance area or the recipient. These reports shall be accompanied by concise notes:

(a) Explaining the inventory changes, on the basis of the operating data contained in the operating records provided for in Article 18(a) of this Protocol; and

(b) Describing, as specified in the relevant Transitional Subsidiary Arrangements, the anticipated operational programme, particularly the taking of a physical inventory.

Article 24

The United States shall report each inventory change, adjustment and correction, either periodically in a consolidated list or individually. Inventory changes shall be reported in terms of batches. As specified in the relevant Transitional Subsidiary Arrangements, small changes in inventory of nuclear material, such as transfers of analytical samples, may be combined in one batch and reported as one inventory change.

Article 25

Material balance reports submitted in accordance with Article 22(b) of this Protocol shall include the following entries, unless otherwise agreed by the United States and the Agency:

- (a) Beginning physical inventory;
- (b) Inventory changes (first increases, then decreases);
- (c) Ending book inventory;
- (d) Shipper/receiver differences;
- (e) Adjusted ending book inventory;
- (f) Ending physical inventory; and
- (g) Material unaccounted for.

A statement of the physical inventory, listing all batches separately and specifying material identification and batch data for each batch, shall be attached to each material balance report.

Article 26

The Agency shall provide the United States with semi-annual statements of book inventory of nuclear material in facilities identified pursuant to Article 2 of this Protocol, for each material balance area, as based on the inventory change reports for the period covered by each such statement.

Article 27

(a) If the Agency so requests, the United States shall provide it with amplifications or clarifications of any report submitted in accordance with Article 19 of this Protocol, in so far as consistent with the purpose of the Protocol.

(b) The Agency shall inform the United States of any significant observations resulting from its examination of reports received pursuant to Article 19 of this Protocol and from visits of inspectors made pursuant to Article 11 of this Protocol.

(c) The United States and the Agency shall, at the request of either, consult about any question arising out of the interpretation or application of this Protocol, including corrective action which, in the opinion of the Agency, should be taken by the United States to ensure compliance with its terms, as indicated by the Agency in its observations pursuant to paragraph (b) of this Article.

Article 28

The definitions set forth in Article 90 of the Agreement shall apply, to the extent relevant, to this Protocol.

Done in _____ on the _____ day of _____ 19 _____,
in duplicate, in the English language.

FOR THE UNITED STATES OF AMERICA: FOR THE INTERNATIONAL ATOMIC ENERGY AGENCY:

G.S. 18 November 1977 J.K.V.V. 18th November 1977

APPENDIX II

THE U.S./IAEA SAFEGUARDS AGREEMENT: NOTABLE DIFFERENCES BETWEEN THE U.S. AGREEMENT AND THE STANDARD IAEA AGREEMENT SPECIFIED IN INFORMATION CIRCULAR 153

There are 20 notable differences between the U.S./IAEA safeguards agreement and the standard IAEA agreement as set out in its information Circular 153 (INFCIRC/153). Each difference is briefly identified and discussed below. Table I provides a summary comparison.

1. BASIC UNDERSTANDING

The U.S. agreement, in Article 1, outlines the basic understanding for application of IAEA safeguards within the United States.

DIFFERENCE

The standard agreement has the agreement State accept safeguards on all source or special fissionable material in all peaceful nuclear activities within its territory, under its jurisdiction, or carried out under its control anywhere, for the exclusive purpose of verifying that such material is not diverted to nuclear weapons or to other nuclear explosive devices. The U.S. agreement permits the Agency to apply safeguards on all source or special fissionable material in all facilities within the United States, excluding only those associated with activities with direct national security significance, with a view to enabling the Agency to verify that safeguarded material is not withdrawn from activities in facilities, except as provided for in the agreement. In addition, the U.S. agreement in subsection 1(b) provides that the United States shall, upon entry in force of the agreement, provide the Agency with a list of facilities within the United States "not associated with activities with direct national security significance" and may add or remove facilities from the list as it deems appropriate. The United States may withdraw nuclear material from activities in the listed facilities.

DISCUSSION

The differences reflect the adaptation of the standard IAEA agreement with a non-nuclear-weapons state to the circumstances of a nuclear-weapons-state. A major innovation is the requirement that the United States provide a list of nuclear facilities outside the weapons chain, and to update the list by addition or deletion. Notice the difference in purpose of the United States and the standard safeguards. For the U.S. agreement, the purpose is to *verify that nuclear material is not withdrawn except as provided*; for the standard agreement, the exclusive purpose is to *verify that such material is not diverted to nuclear weapons or explosives*. It may be desirable to inquire what impli-

cations, if any, this difference could have for the argument that in accepting IAEA safeguards the United States is sharing the misery of other nuclear supplier, but non-nuclear-weapons states.

2. APPLICATION OF SAFEGUARDS

Article 2 of the U.S. agreement specifies the Agency's right to apply safeguards in the United States.

DIFFERENCE

The U.S. agreement gives the Agency the right to apply safeguards on all source or special fissionable material in all facilities within the United States, excluding only those associated with "direct national security significance to the United States." The standard agreement provides for the Agency's right and obligation to ensure that safeguards will be applied to all source or special fissionable material in all peaceful nuclear activities of the State. The U.S. agreement specifies that the purpose of the safeguards is to enable the Agency to verify that such material is not withdrawn, except as provided under the agreement, from activities in facilities while such material is being safeguarded. The standard agreement specifies that the exclusive purpose of safeguards is to verify that such material is not diverted to nuclear weapons or other nuclear explosives devices.

DISCUSSION

As noted above, this difference in purpose of safeguards could be important, depending upon how other nations distinguish between safeguards intended to verify that materials are not withdrawn and those intended to verify that materials have not been diverted.

The provision of U.S. Article 2 that the Agency can choose facilities from the U.S. list to which it wishes to apply safeguards allows the Agency to apply safeguards to a sample of U.S. nuclear facilities and not to all of them. Note that the United States has no formal voice in the selection, although presumably it could exercise considerable informal influence in Vienna. Note too that the further provision that in choosing facilities for safeguards the Agency is to avoid discriminatory treatment as between U.S. commercial firms similarly situated. However, if the Agency and the United States could not agree on these selections, the matter would go to dispute procedures.

3. COOPERATION WITH THE AGENCY

Article 3 of the U.S. agreement provides for U.S. cooperation with the Agency in carrying out safeguards under the agreement, defines the materials to be safeguarded, and provides for the Agency to apply its safeguards with the same procedures used for nonnuclear-weapons countries.

DIFFERENCES

Article 3 of the standard agreement simply provides for the State and agency to cooperate to facilitate the implementation of safeguards.

It does not contain the specification of the U.S. agreement that materials subject to safeguards shall be in those facilities identified by the Agency. Likewise, the standard agreement does not provide that the IAEA safeguards shall be implemented by the same procedures followed by the Agency in applying its safeguards on similar material in similar facilities in nonnuclear-weapons States.

DISCUSSION

Both differences from the standard agreement reflect adaption to a nuclear-weapon State. The second underscores the idea that as far as possible, IAEA safeguards should be applied in the same way in both weapons and non-weapons States. This would give the United States good working insight into what to expect of IAEA safeguards in other States.

4. THE U.S. SYSTEM FOR ACCOUNTING AND CONTROL OF NUCLEAR MATERIALS

Article 7 of the U.S. agreement requires the United States to establish and maintain a national system of accounting for and control of all nuclear materials subject to safeguards under the agreement.

DIFFERENCE

Article 7 of the standard agreement provides that the agreement shall establish and maintain a system of accounting for and control of all nuclear material subject to IAEA safeguards. The safeguards are to be applied so as to enable the Agency to independently verify findings of the state's system in ascertaining that there has been no *diversion* of nuclear material from peaceful uses to nuclear weapons or to other nuclear explosive devices. U.S. Article 7 provides for the Agency to apply safeguards so as to enable it to independently verify findings of the U.S. accounting and control system that there has been no *withdrawal* of nuclear materials for activities in facilities while such material is being safeguarded under the agreement. For both versions, the Agency's verification is to include, among other things, independent measurements and observations conducted by the Agency.

DISCUSSION

The difference in purpose for IAEA safeguards for the U.S. and the standard agreements may be significant, depending upon how other countries view the difference between a system to verify that there has been no unauthorized withdrawal and a system to verify that there has been no diversion. If withdrawal and diversion are considered much the same, then there should be little problem. However, if non-nuclear weapons-states see a significant difference, then the purpose of the U.S./IAEA agreement could be weakened if it were argued that the safeguards applied in the United States therefore would be less demanding and the United States would take up less than its fair share of the misery of safeguards.

5. PRIVILEGES AND IMMUNITIES

Article 10 of the U.S. agreement provides for privileges and immunities for the Agency and its staff.

DIFFERENCE

The standard agreement specifies privileges and immunities to be granted to the Agency and its staff in respect to their functions. The U.S. agreement specifies that the International Organization Immunities Act shall apply to Agency inspectors in the United States.

DISCUSSION

This difference simply conforms the U.S. agreement to existing statute, and provides the same privileges and immunities for IAEA inspectors as are provided for other international organizations. The statute specifies the privileges and immunities in more detail than appears in the Agency's standard agreement. [For further information see 22 USC 288]

6. TRANSFER OF NUCLEAR MATERIALS OUT OF THE UNITED STATES

Article 12 of the U.S. agreement deals with U.S. rights to withdraw nuclear material from listed facilities and to transfer such materials to destinations not included on the list.

DIFFERENCE

The standard agreement, Article 12, provides for notification to the IAEA of transfers of nuclear materials subject to safeguards out of the state. The U.S. agreement provides for the United States to notify the Agency of withdrawal of nuclear materials from listed facilities and transfer of that material to unlisted facilities. The U.S. agreement also provides that nothing in the agreement shall affect the right of the United States to transfer material subject to safeguards under the agreement to destinations within or under the jurisdiction of the United States (Section 12(b)).

DISCUSSION

Again, this appears to be an adaptation of the standard agreement for safeguards in a non-nuclear-weapons state to safeguards in a nuclear-weapons state. It would permit the United States to transfer nuclear materials to and from unlisted facilities. If the contemplated national spent fuel storage center is not included in the list of U.S. facilities to be safeguarded, the provision would enable the United States to transfer the plutonium contained in spent fuel out of the safeguarded system with only an obligation to notify the Agency.

7. ENSURING U.S. COMPLIANCE

Article 17 of the U.S. agreement deals with authority of the Agency to call upon the United States to take certain actions without delay and without waiting for completion of dispute procedures.

DIFFERENCE

The U.S. agreement provides that if the IAEA Board, upon report of the Director General, decides that an action by the United States is essential and urgent "in order to ensure compliance with this agreement," the Board may call upon the United States to take required action without delay, irrespective of whether dispute procedures are in progress. The standard agreement, in Article 18, provides for such Board action to "... ensure verification that nuclear material subject to safeguards under the agreement is not diverted to nuclear weapons or other nuclear explosive devices."

DISCUSSION

It seems that action to ensure compliance with an agreement may be read differently from action to verify that nuclear materials are not diverted. The U.S. version, for example, might be read as preventing the IAEA from inquiring into the kind of situation that arose at NUMEC where there have been some charges or suspicions that nuclear materials unaccounted for at this company were diverted to Israel. It would be pertinent to ask whether this was what the U.S. negotiators had in mind.

8. REMEDIES FOR U.S. NONCOMPLIANCE

Article 18 of the U.S. agreement provides for the IAEA to call upon the United States to remedy noncompliance with the agreement and to report to the United Nations and other IAEA members if the United States does not do so.

DIFFERENCE

The U.S. agreement provides that if the IAEA's Board, upon examination of relevant information reported to it by the Director General, determines that there has been *any non-compliance* with the agreement, the Board may call upon the United States to remedy such non-compliance forthwith. If the United States does not do so within a reasonable time, the Board may report the matter to other IAEA members and to the United Nations Security Council and General Assembly. The standard agreement, Article 19, provides that if the Board, upon examination of relevant information reported to it by the Director General, *finds* that the *Agency is not able to verify* that there has been no diversion of safeguarded nuclear materials to nuclear weapons or other nuclear explosive devices, it may make these reports.¹

¹ Both the U.S. agreement and the standard agreement refer to Article XIII-C of the international statute that established the Agency. Article XII-C provides in part as follows: "... The inspectors shall report any noncompliance to the Director General who shall thereupon transmit the report to the Board of Governors. The Board shall call upon the recipient State or States to remedy forthwith any noncompliance which it finds to have occurred. The Board shall report the noncompliance to all members and to the Security Council and General Assembly of the United Nations. In the event of failure of the recipient State or States to take fully corrective action within a reasonable time, the Board may take one or both of the following measures: direct curtailment or suspension of assistance being provided by the Agency or by a member, and for the return of materials and equipment made available to the recipient member or group of members. The Agency may also, in accordance with article XIX suspend any concommitting member from the exercise of the privileges and rights of membership."

DISCUSSION

Here again the difference appears to be the outcome of adaptation. However, a determination that there has been any noncompliance with the agreement appears to be rather different than a finding that the Agency cannot verify that there has been no diversion of nuclear materials. The former could lead to nit-picking actions against the United States while the latter would clearly limit Board action to dealing with the critical matter of diversion.

9. SUSPENSION OF IAEA SAFEGUARDS UNDER OTHER AGREEMENTS

Article 22 of the U.S. agreement provides for suspension of IAEA safeguards of nuclear materials under other safeguards agreements while such materials are in the United States and while the U.S. agreement is in force. Such suspension would prevent the confusion of having nuclear materials imported from, for example, Canada or Australia, subject to possibly conflicting or incompatible requirements of IAEA safeguards agreements with the United States and with the supplier state.

DIFFERENCE

The U.S. agreement includes a special provision that does not appear in the standard agreement. The U.S. agreement provides that the United States and the Agency shall "... ensure that nuclear materials being safeguarded under this agreement shall be at all times at least equivalent in amount and composition to that which would be subject to safeguards in the United States under the agreements in question."

DISCUSSION

The IAEA has two general types of safeguards agreements, one for use with NPT states and one for non-NPT states. While the two are similar in many respects, there are differences. The IAEA's NPT system emphasizes timely detection of diversion of significant quantities of nuclear materials to nuclear weapons or other nuclear explosive devices, or for purposes unknown. The non-NPT system emphasizes assurance that nuclear materials are not used to further any military purpose. NPT safeguards apply to all nuclear materials and facilities in a state, while the non-NPT safeguards apply only to specific nuclear materials and facilities. NPT safeguards require a national accounting and management system for nuclear materials. Non-NPT safeguards do not, but instead depend on special reports and inspections. It is not clear whether these differences in IAEA safeguards systems would cause problems if the item or material to be safeguarded came from a non-NPT state.

10. ENTRY INTO FORCE AND DURATION OF THE AGREEMENT

Article 26 of the U.S. agreement provides that the agreement shall remain in force as long as the United States is a party to the NPT.

DIFFERENCE

In addition to the above provision, which is the standard Article 26, the U.S. agreement provides that the Parties shall, upon the request of either, consult and, to the extent mutually agreed, modify the Agreement in order to ensure that it continues to serve the original purposes. If the parties are unable to agree, either party may terminate the agreement upon six months' notice.

DISCUSSION

Article 23 of the U.S. agreement and of the standard agreement provide for consultation on amendments to the agreement and specify that all amendments require agreement of the state and the agency. Now comes Article 26 of the U.S. agreement, with its added provisions for consultation and agreement on modification of the agreement. Coupled to this is a limitation on the purposes of modification—in order to ensure that the agreement continues to “. . . serve the purpose for which it was originally intended”—plus a provision for termination of the agreement upon six months' notice if the parties cannot agree upon “necessary modifications.” Several questions emerge. First, what is the difference between an amendment, as provided for in Article 23, and a modification, as provided in Article 26? If there is a difference, what is it, and what is its significance? Second, is this addition to the standard Article 26 intended to provide the United States with a back-door way to terminate the agreement by demanding modifications unacceptable to the Agency? Also, the termination language is keyed to “necessary” modifications. What is “necessary,” who defines it? Why is “necessary” used instead of “requested” or “proposed?” What did the negotiators have in mind with these additions to the standard article?

Since the original U.S. agreement is to be ratified as a Treaty, would amendments under Article 23 or modifications or termination under Article 26 require the advice and consent of the Senate?

11. OBJECTIVE OF SAFEGUARDS

Section 28 of the U.S. agreement defines the objective of the IAEA safeguards under the agreement.

DIFFERENCE

The U.S. agreement specifies that the objective of the procedures is the “. . . timely detection of withdrawals, other than in accordance with the . . . Agreement, of significant quantities of nuclear material from activities in facilities while such material is being safeguarded under this agreement.” The standard agreement, in Article 28, specifies that the objective of safeguards is “the timely detection of diversion of significant quantities of nuclear material from peaceful activities to the manufacture of nuclear weapons or of other nuclear activities to the manufacture of nuclear weapons or of other nuclear explosive devices or for purposes unknown, and deterrence of such diversion by the risk of early detection.” The difference, which was discussed earlier,

again reflects adaptation of the standard agreement to a nuclear-weapons state. However, timely detection of withdrawal may be a less demanding and rigorous criterion than timely detection of diversion. It is not clear what are the implications of this change from detection of diversion to detection of withdrawal. This difference merits inquiry.

12. ADDITION OR REMOVAL OF FACILITIES FROM THE U.S. LIST

Article 34 of the U.S. Agreement provides that the United States may, at any time, notify the Agency of any facility or facilities to be added to or removed from the list of facilities.

Article 38 then provides for U.S. modification of facilities added or removed from the list. Advance notification is required for removal, except in exceptional circumstances. The nuclear materials contained in a removed facility also shall cease to be subject to safeguards under the agreement.

DIFFERENCE

The standard agreement contains no similar provision.

DISCUSSION

Article 34 specifies procedures for the United States to add or remove facilities from the facility list. The procedures follow logically from the concept of listing and of keeping the list up to date.

13. SUBSIDIARY ARRANGEMENTS

Article 39 of the U.S. agreement provides that the subsidiary arrangements will comprise an integral part of the U.S.-IAEA safeguards system.

DIFFERENCE

Article 39 of the standard agreement provides for an agreement state to make subsidiary arrangements with the Agency which specify in detail how procedures laid down in the agreement are to be applied. Article 39 of the U.S. agreement likewise provides for the United States and the Agency to make subsidiary arrangements. The U.S. agreement then adds provisions to adapt it to the listing concept. Article 39(a) (i) specifies that the subsidiary arrangement shall contain a listing of those facilities identified by the Agency and thus containing nuclear materials to be safeguarded. Article 39(b) provides authority for the Agency to identify from the list facilities to be included in the initial subsidiary arrangement listing, for the Agency to identify for inclusion in the subsidiary arrangements listing of additional facilities, and for the Agency to designate those facilities to be removed from the subsidiary arrangements listing.

DISCUSSION

These changes in the U.S. agreement are needed to carry out the idea of selective application of safeguards rather than application to all facilities as is the case for standard agreements. It gives the Agency full and free choice to decide which facilities it wishes to safeguard,

and to drop some and choose others at its desire with no consultation with the United States or U.S. approval.

14. UNIFIED INVENTORY OF NUCLEAR MATERIALS

Article 41 of the standard agreement provides for the Agency to establish, on the basis of initial reports from the agreement state, a unified inventory of all nuclear material subject to safeguards under the agreement, irrespective of its origins, and to maintain this inventory on the basis of subsequent reports and the results of its verifications.

DIFFERENCE

The U.S. agreement limits the information in the initial and subsequent reports to that for listed facilities.

DISCUSSION

The difference again is one of adaptation.

15. ACCOUNTING REPORTS

Article 63 of the standard agreement stipulates the information to be provided for each materials balance area report.

DIFFERENCE

The standard agreement requires reports showing changes in the inventory. The U.S. agreement requires reports showing *all* such changes in the inventory.

DISCUSSION

It would be interesting to know why the negotiators inserted the word "all" in the U.S. agreement. Taken literally, this could generate a flood of paperwork on nominal or inconsequential changes.

16. ACCOUNTING REPORTS

Article 71 of the standard agreement authorizes the Agency to make ad hoc inspections for three purposes.

DIFFERENCE

The U.S. agreement changes one of the stated purposes of the ad hoc inspections. Subsection 71(c) of the standard agreement specifies that one purpose of the ad hoc inspections is to "[i]dentify, and if possible verify the quantity and composition of nuclear material . . . before its transfer out of or upon its transfer into the State." Subsection 69(c) of the U.S. agreement specifies that the corresponding purpose is to "[i]dentify and if possible verify the quantity and composition of the nuclear material subject to safeguards under this agreement in respect to the Agency." Article 89(a) provides that "[i]nformation concerning nuclear material exported from and imported into the United States shall be provided to the Agency in accordance with arrangements made with the Agency . . ."

DISCUSSION

Here the U.S. agreement is confusing and needs clarification. Does it mean that one purpose of IAEA ad hoc inspections is to identify and if possible verify the quantity and composition of nuclear materials subject to IAEA safeguards that have been exported from or imported into a listed facility?

17. ACCESS FOR IAEA INSPECTIONS

Article 76 of the standard agreement provides for access for IAEA inspections.

DIFFERENCE

The standard agreement in Article 76(b) provides that IAEA inspectors shall have access to any location of which the Agency has been notified by the agreement state. The U.S. version in Article 74(b) provides for IAEA inspectors to have access to any facility "... identified pursuant to Articles 2(b) or 39(b) in which nuclear material referred to in Article 69(c) is located."²

DISCUSSION

The difference again is one of adaption and follows logically.

18. NOTICE OF INSPECTIONS

The standard agreement in Article 83 provides that the Agency shall give advance notice to the agreement state before arrival of inspectors at facilities or material balance areas outside facilities.

DIFFERENCE

The U.S. agreement in Article 81 provides that the Agency shall give advance notice of the arrival of inspectors at facilities listed in the subsidiary arrangements. So the U.S. version omits the phrase "material balance outside facilities."³ This difference implies that IAEA inspections would be limited to listed facilities and to material balance areas *within* such facilities but would exclude material balance areas *outside* listed facilities. It is not clear what the practical effect of this would have for application of IAEA safeguards in the United States.

² Article 2(b) specifies that "the Agency shall, from time to time, identify to the United States those facilities, selected from the then current list provided by the United States . . . in which the Agency wishes to apply safeguards, in accordance with the terms of this agreement" Article 39(b) specifies that after entry into force of the agreement, the Agency shall "... identify to the United States, from the list provided in accordance with Article 1(b), those facilities to be included in the initial Subsidiary Arrangements listing;" and that the Agency may thereafter "... identify for inclusion in the Subsidiary Arrangements listing additional facilities from the list provided in accordance with Article 1(b) as that list may have been modified in accordance with Article 34." Article 69(c) is described above for item (16).

³ Both the standard agreement and the U.S. version define materials balance area to mean an area in or outside of a facility such that: (a) the quantity of nuclear material in each transfer into or out of each material balance area can be determined; and (b) the physical inventory of nuclear material in each material balance area can be determined when necessary in accordance with specified procedures, in order that the material balance for Agency safeguards purposes can be established.

19. INFORMATION ON NUCLEAR EXPORTS AND IMPORTS

The U.S. agreement, Article 89(a), provides that the United States shall provide the Agency with information concerning nuclear material exported from and imported into the United States in accordance with arrangements made with the Agency.

DIFFERENCES

The standard agreement in Article 34 provides for an agreement state to inform the Agency in detail about any material containing uranium or thorium not suitable for fuel fabrication or for enrichment which is directly or indirectly exported to a non-nuclear-weapons state, or that is imported. In addition, it specifies that when any nuclear material "... of a composition and purity suitable for fuel fabrication or for being isotopically enriched leaves the plant or the process stage in which it has been produced, or when such nuclear material, or any other nuclear material produced at a later stage in the nuclear fuel cycle is imported into the State, the nuclear material shall become subject to the other safeguards procedures specified in the agreement." These provisions differ substantially from the terse article in the U.S. agreement. It is not clear why the details mentioned in Article 34 of the standard agreement are omitted from the U.S. agreement or what is the significance of this change. In particular, what significance is there in omission from the U.S. agreement of the last provision of the standard agreement concerning change in safeguards for upgraded nuclear materials?

TABLE I.—COMPARISON OF CONTENTS OF THE UNITED STATES/IAEA SAFEGUARDS AGREEMENT AND INFORMATION CIRCULAR 153

Subject	Article No.		Notable difference	Mentioned in DOS transmittal
	Agreement	INFCIRC		
Part I—Commitments:				
Basic understanding.....	1	1	X	X
Application of safeguards.....	2	2	X	X
Cooperation of parties.....	3	3	X	
Safeguards implementation.....	4	4		
	5	5		X
	6	6		
U.S. safeguards system.....	7	7	X	
Information for the Agency.....	8	8		X
Agency inspectors.....	9	9	X	X
Privileges and immunities.....	10	10	X	
Termination of safeguards.....	11	11		
	12	12	X	
	13	13		
Financing safeguards.....	14	15		
Third party liability.....	15	16		
Settlement of claims.....	16	17		
Ensuring U.S. compliance.....	17	18	X	X
Remedies for U.S. noncompliance.....	18	19	X	X
Interpretation, disputes.....	19	20		X
	20	21		X
	21	22		X
Suspension of safeguards.....	22	24	X	X
Amendments to the Agreement.....	23	23		
Entry into force and duration.....	24	25		X
	25	26		X
	26		X	X

TABLE I.—COMPARISON OF CONTENTS OF THE UNITED STATES/IAEA SAFEGUARDS AGREEMENT AND INFORMATION CIRCULAR 153—Continued

Subject	Article No.		Notable difference	Mentioned in DOS transmittal
	Agreement	INFCIRC		
Part II—Implementation:				
Purpose.....	27	27		
Objectives of safeguards.....	28	28	×	
	29	29		×
	30	30		
National systems.....	31, 32	31, 32		
Starting point for safeguards.....	33	33		×
Addition or removal of facilities from list.....	34	NA	×	×
Termination of safeguards.....	35	35		×
Exemptions from safeguards.....	36	36		×
	37, 38	37, 38		
Subsidiary arrangements.....	39	39	×	×
	40	40		
Unified inventory.....	41	41		
Design information:				
General.....	42, 44	42, 44		
	45	45	×	
Purposes of examination.....	46	46		
Re-examination.....	47	47		
Verification.....	48	48		×
Records:				
General.....	49-53	51-55		
Accounting records.....	54, 55	56, 57		
Operating records.....	56	58		
Reports:				
General.....	57-59	59-61		
Accounting.....	60	62		
	61	63	×	
	62-65	64-67		
Special.....	66-67	68-69		×
Inspections:				
General.....	68	70		
	69	71	×	×
	70, 71	72, 73		×
Scope.....	72, 73	74, 75		
Access.....	74	76	×	
	75	77		
Frequency and intensity.....	76, 77	78, 79		
	76-80	78-82		
Notice.....	81	83	×	×
	82	84		×
Designation of inspectors.....	83, 84	85, 86		
Conduct and visits.....	85	87		×
	86, 87	88, 89		
Statements on Agency's verifications.....	88	90		
Special reports.....	89	97	×	
Definitions.....	90	98		

APPENDIX III

THE U.S./IAEA SAFEGUARDS AGREEMENT: PROVISIONS OF THE STANDARD IAEA AGREEMENT THAT DO NOT APPEAR IN THE U.S. AGREEMENT

Eight articles of the standard IAEA safeguards agreement with non-nuclear-weapons NPT states do not appear in the U.S./IAEA agreement. These include:

ARTICLE 14: NON-APPLICATION OF SAFEGUARDS TO NUCLEAR MATERIAL TO BE USED IN NON-PEACEFUL ACTIVITIES

Article 14 provides procedures for a non-nuclear-weapons state to apply if it intends to exercise its discretion to use safeguarded nuclear materials for a nuclear activity which does not require the application of safeguards.

ARTICLE 49: INFORMATION ON NUCLEAR MATERIAL OUTSIDE FACILITIES

Article 49 requires the agreement state to provide information for the Agency on nuclear material customarily used outside facilities, including a general description of the use of the material, its geographic location, the user's name and address, and a general description of procedures for nuclear material accountancy and control.

ARTICLE 92. TRANSFERS OUT OF A STATE

Article 92 provides that any intended transfer out of an agreement state of safeguarded nuclear material in an amount more than one effective kilogram,¹ or by successive shipments to the same state within a period of three months each of less than one effective kilogram but exceeding in total one effective kilogram, shall be notified to the Agency after the conclusion of the contractual arrangements leading to the transfer and normally at least two weeks before the material is to be prepared for shipping. The article then provides for three different procedures for advance notification to the Agency.

ARTICLE 93: TRANSFERS OUT OF THE STATE

Article 93 provides that the purpose of this notification shall be to enable the Agency if necessary to identify, and if possible, to verify, the quantity and composition of nuclear materials safeguarded under

¹ Effective kilogram is defined to mean a special unit used in safeguarding nuclear material. The quantity in effective kilograms is obtained by taking: for plutonium, its weight in kilograms; for uranium with an enrichment of 0.01 (1 percent) and above, its weight in kilograms multiplied by the square of its enrichment; for uranium with an enrichment below 0.01 (1 percent) and above 0.005, (0.5 percent), its weight in kilograms multiplied by 0.0001; and for depleted uranium with an enrichment of 0.005 (0.5 percent) or below, and for thorium, their weight in kilograms multiplied by 0.00005.

the agreement before it is transferred out of the state; and, if the Agency so wishes or the state so requests, to affix seals to the nuclear material when it has been prepared for shipping. However, the transfer is not to be delayed in any way by any action taken or contemplated by the Agency pursuant to this notification.

ARTICLE 94. TRANSFERS OUT OF THE STATE

Article 94 provides that, if the nuclear material will not be subject to Agency safeguards in the recipient state, the exporting state shall make arrangements for the Agency to receive, within three months of the time when the recipient state accepts responsibility for the nuclear material, confirmation by the recipient state of the transfer.

ARTICLE 95. TRANSFERS INTO THE STATE

Article 95 provides that the expected transfer into the State of nuclear materials required to be safeguarded in an amount greater than one effective kilogram, or by successive shipments from the same state within three months, each of less than one effective kilogram, shall be notified to the Agency as much in advance as possible of the expected arrival of the nuclear material, and in any case not later than the date on which the recipient state assumes responsibility. The article then outlines three procedures for this advance notification.

ARTICLE 96. TRANSFERS INTO THE STATE

The agreement should provide that the purpose of the notification shall be to enable the Agency if necessary to identify, and if possible verify, the quantity and composition of nuclear material subject to safeguards which has been transferred into the state, by means of inspection of the consignment at the time it is unpacked. However, unpacking shall not be delayed by any action taken or contemplated by the Agency pursuant to this notification.

APPENDIX IV

COMPARISON OF THE U.S./IAEA SAFEGUARDS AGREEMENT AND THE PROTOCOL

A notable feature of the U.S./IAEA Safeguards Agreement is the Protocol which provides for arrangement that of the listed U.S. nuclear facilities not selected for active safeguards, some should be kept in a standby status which would allow prompt future application of safeguards if selected by the Agency for full safeguards. The 28 articles of the Protocol closely follow counterpart articles in the Agreement, with nine notable differences that are identified and discussed below.

PROTOCOL ARTICLE 1. PROCEDURES

Protocol Article 1 specifies procedures for the Agency to identify listed nuclear facilities other than those it has selected for safeguards, which, in essence, are to be kept in standby for future application of safeguards. For these, the United States is to provide information on design and to keep accountability records and to submit accountability reports as though the facility were under full safeguards. In comparison, Article 1 of the Agreement requires the United States to permit the Agency to apply safeguards to selected facilities.

PROTOCOL ARTICLE 2. AGENCY SELECTION OF FACILITIES

Protocol Article 2 specifies that the Agency may identify from time to time listed nuclear facilities in addition to those under safeguards for which standby information will be provided by the United States. In identifying such facilities, the Agency is to proceed in a manner which it and the United States mutually agree takes into account the requirement on the United States to avoid discriminatory treatment between U.S. commercial nuclear firms similarly situated.

Article 2 of the Agreement, by comparison, provides for the right of the Agency to apply safeguards in facilities which it selects from the U.S. list.

PROTOCOL ARTICLE 3. TRANSITIONAL SUBSIDIARY AGREEMENTS

The Agreement, in Article 39, provides for subsidiary arrangements that specify how the procedures of the agreement are to be applied. Protocol Article 3 provides for a limited kind of subsidiary arrangement, called a Transitional Subsidiary Arrangement, which is to contain a current listing of facilities identified by the Agency for standby plus procedures for how the Protocol is to be applied.

PROTOCOL ARTICLE 4. INTERIM TRANSITIONAL SUBSIDIARY ARRANGEMENTS

Protocol Article 4 commits the United States and the Agency to make every effort to complete within 90 days the Transitional Subsidiary Arrangements for each facility chosen by the Agency for standby status. It specifies certain information that shall constitute such arrangements until and unless the United States and the Agency otherwise complete Transitional Subsidiary Arrangements. There is no counterpart article in the Agreement.

PROTOCOL ARTICLE 5. TRANSITION TO SUBSIDIARY ARRANGEMENTS

Protocol Article 5 provides that if the Agency chooses to apply full safeguards to a facility in standby status, the Transitional Subsidiary Arrangements for such a facility shall, to the extent that they satisfy the Agreement, be deemed to have been made part of the Subsidiary Arrangements. There is no counterpart in the Agreement.

PROTOCOL ARTICLE 27. INFORMATION ON SIGNIFICANT AGENCY OBSERVATIONS

Protocol Article 27(b) provides for the Agency to inform the United States of any significant observations resulting from its examination of reports and from visits of its inspectors to verify design information. The counterpart Article 88 in the Agreement provides for the Agency to inform the United States of the results of inspections and also of the conclusions it has drawn from its verification activities in the United States.

NOTABLE AGREEMENT PROVISIONS NOT IN THE PROTOCOL

Two notable provisions of the Agreement without counterparts in the Protocol deal with IAEA inspection of accounts and materials, and with special reports.

INSPECTIONS

The Protocol differs from the Agreement which, in Articles 68 to 79, provides for IAEA inspection to verify design information and accounting information; whereas the Protocol, in Article 11, provides for IAEA inspection only to verify design information.

SPECIAL REPORTS

The Agreement, in Article 66, provides for the United States to make special reports on losses of safeguarded materials or changes in containment that would make possible unauthorized removal of safeguarded materials. The Protocol has no counterpart.

TABLE I.—COMPARISON OF THE UNITED STATES/IAEA SAFEGUARDS AGREEMENT AND ITS PROTOCOL

Subject	Article No.		Notable differences ¹
	Agreement	Protocol	
Procedures.....	1.....	1.....	×
Agency selection of standby facilities and discriminatory treatment.....	2.....	2.....	×
	2(c).....	2(c).....	
Transitional subsidiary arrangements.....	39.....	3.....	×
	NA.....	4.....	×
	NA.....	5.....	×
Design information.....	43.....	6.....	
Other information.....	44.....	7.....	
Design information for modifications.....	45.....	8.....	
Use of design information.....	46.....	9.....	
Reexamination of design information.....	47.....	10.....	
Inspection of design information.....	48.....	11.....	
National accounting system.....	7, 49.....	12.....	
Records retention.....	51.....	13.....	
Measurements.....	53.....	15.....	
Accounting records.....	54.....	16.....	
Inventory changes and physical inventories.....	55.....	17.....	
Operating records.....	56.....	18.....	
Accounting reports.....	57.....	19.....	
	59.....	20.....	
Initial report.....	60.....	21.....	
Accounting reports—material balance areas.....	61.....	22.....	
Inventory changes reports.....	62.....	23.....	
	63.....	24.....	
Material balance reports.....	65.....	25.....	
Book inventory statements.....	64.....	26.....	
Amplifications/clarifications.....	67.....	27.....	
Significant observations.....	88.....	27.....	
Consultation.....	19.....	27(c).....	
Definitions.....	88.....	28.....	

¹ Since most of the comparative provisions of the protocol and the agreement are similar, the differences identified here are differences in substance.

STATE OF NEW YORK

IN SENATE
January 1, 1903

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