

This book is part of the PIR research project «Sensitive Exports and Export Control in Russia» implemented by the Center since 1997. The book contains a variety of new facts concerning the history of the Nuclear Suppliers Group, as well as gives a thorough analysis of certain unique documents. Amb. Timerbaev, Russia's top expert in the area of nuclear nonproliferation, focused in this work on the history of the NSG establishment, its key documents (above all, the Guidelines for Nuclear Transfers), and the problem of full-scope safeguards application. Particular emphasis has been placed on assessing Soviet legislation after the adoption of the Guidelines.

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PREFACE

Currently, the problem of WMD-sensitive export control is one of the most pressing items on the international agenda. On the one hand, it is necessary to enhance the efficiency of international export control regimes, particularly in the nuclear area. In addition, there are demands for the greater transparency of such regimes, which are currently condemned for their allegedly discriminatory character. This polemic significantly affects discussion on the prospects of WMD nonproliferation efforts on the whole.

The urgency and complexity of the export control debate is why the PIR Center -- Russia's leading nongovernmental research institution in the area of WMD nonproliferation -- has been carrying out for seven years a project concerning export controls. Within the framework of the project the Center holds conferences and seminars and publishes articles, study papers, and analytical reports.

It is impossible to speak about the prospects of the international export control regimes without understanding the conditions and prerequisites for the establishment of the regimes. In the course of our research activities in this area, we have found that credible sources of the history of the *Zangger* Committee and the Nuclear Suppliers Group are scarce.

This gap has been now eliminated, thanks to Roland Timerbaev, Russia's top expert in the area of nuclear nonproliferation, who focused in this work on the history of the NSG establishment, its key documents (above all, the Guidelines for Nuclear Transfers), and the problem of full-scope safeguards application. Particular emphasis has been placed on assessing Soviet legislation after the adoption of the Guidelines.

Readers will obviously appreciate that many facts mentioned in this book are being published for the first time. These new accounts include recollections of the author who participated in the negotiations that eventually resulted in the approval of the Guidelines. Much information has been obtained from various archives and from interviews with the author's colleagues.

This book by Roland Timerbaev will be of interest to Russian and foreign experts in the area of nuclear nonproliferation; thus we have decided to publish it in both Russian and English. We believe that this book will contribute to the internationalization of the discussion concerning the role of the NSG and further development of international export controls.

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INTRODUCTION

The Nuclear Suppliers Group (NSG) is an important mechanism of the international nuclear nonproliferation regime founded on the sound basis of the NPT. Since its first meeting in 1975, the NSG has been in charge of determining, upgrading and enhancing approved international rules for the export of nuclear material and technology. The present study is to cover the history of the NSG establishment, analyze the reasons for the joint efforts of nuclear suppliers aimed at strengthening the nonproliferation regime, look back at the process of negotiating principles and norms of export controls in order to better understand the meaning of the Guidelines for Nuclear Transfers that was originally introduced in the authors' provisions.

A special study of the establishment and activities of the NSG has not yet been written, except for a few articles in periodicals and books devoted to nuclear nonproliferation and sensitive export controls, reports at conferences and brief notes and commentaries in some monographs and reference books¹. One should also bear in mind that some editions contain factual mistakes concerning the NSG activities².

The NSG has always met in closed sessions. This circumstance has given birth to some myths about its activities and has raised questions and criticism on the

¹ See: Goldschmidt Bertrand. Le complexe atomique. Histoire politique de l'énergie nucléaire. Paris, Fayard, 1980, pp.420-425; Rogov A.N. Regulating Nuclear Export. / Petrosyants A.M. (Ed.). Atom -- Only Peaceful. M., Nauka, 1985, pp.55-65 (in Russian); Palamarchuk P.G. Nuclear Export: International Law Regulations. M., Nauka, 1988 (in Russian); Timerbaev Roland. A Major Milestone in Controlling Nuclear Exports. *Eye on Supply*, No.6, Spring 1992, pp.58-65; Strulak Tadeusz. The Nuclear Suppliers Group. *The Nonproliferation Review*, No.1, Vol.1, Fall 1993, pp.2-10; Fischer David. The London Club and the Zangger Committee: How Effective? / Bailey Kathleen & Rudney Robert (Eds.). Proliferation and Export Controls. Lanham, Maryland, University Press of America, Inc. 1993, pp.39-48; Akhtamzyan I.A. Introduction. / Nonproliferation of Nuclear Weapons. Collection of Documents. M., Mezhdunarodnye otnosheniya, 1993, pp.18-21 (in Russian); Bertsch Gary K., Cupitt Richard T., and Elliott-Gower Steven. Multilateral Export Control Organizations. / International Cooperation on Nonproliferation Export Controls. Prospects for the 1990s and Beyond. Ann Arbor. The University of Michigan Press, 1994, pp.33-44; Gardner G. Nuclear Nonproliferation, M., MEPhi, 1995, pp.84-86; Inventory of International Nonproliferation Organizations and Regimes. 1996-1997 Edition. Center for Nonproliferation Studies. Monterey Institute of International Studies. Monterey (CA), May 1997, pp.21-23; Kirichenko E.V. Regulating Nuclear Export. In: Disarmament and Security, 1997-1998. M., Nauka, 1997, pp.132-142 (in Russian); Thorne Carlton E. Multilateral Nuclear Export Controls: Past, Present and Future. Presentation at the International Seminar on the Role of Export Controls in Nuclear Non-Proliferation. Vienna. 7-8 October 1997, pp.25-37; Fischer David. History of the International Atomic Energy Agency. The First Forty Years. Vienna, IAEA, 1997, pp.98, 101, 112, 230, 261-163, 265, 303; Baer Alec. Nuclear Suppliers Group and its Time. Presentation at the 2nd International Seminar on the Role of Export Controls in Nuclear Non-Proliferation. New York. 8-9 April 1999, pp.3-15; Efimov Andrey. Further Cooperation in the Field of Export Controls. Presentation at the same seminar. pp.61-66; Yefimov A.M. The NSG and New Challenges to the International Nonproliferation Regime. *Yaderny Kontrol*, No.3, May-June 2000, pp.58-61 (in Russian); Communication Received from the Permanent Mission of the Netherlands on behalf of the Member States of the Nuclear Suppliers Group (INFCIRC/539/Rev.1 of 6 June 2000); Evstafiev D. and Orlov V. (Eds.). Export Controls in Russia: Policy and Practice. Collection of Articles. M., PIR Library Series, 2000 (in Russian).

² For instance, one authoritative reference book says that the NSG was founded in 1993 (Yearbook of International Organizations 1999/2000. Vol.1B. Brussels, Union of International Associations, 1999, p.1809).

part of developing states, which believed (and some still continue to believe) that the *rich* countries had made some secret agreement and established a *closed cartel* to infringe upon the *inalienable* rights of the *poor countries* to obtain advanced nuclear technologies. However, as time passed, the international community began to realize the significance of export controls as a necessary (though not always favorable for the recipients) instrument for maintaining the nuclear nonproliferation regime and global security.

Recipients often demand greater transparency of the export control activities of the nuclear suppliers. These demands were voiced at the 1995 and the 2000 NPT Review Conferences and were reflected in appropriate decisions by the two forums. In 1997 and in 1999, the suppliers and recipients held international seminars to create more awareness of the NSG and the *Zangger* Committee's activities. The present study is also aimed at better informing the public and officials in various states about the NSG work.

In Russia there is wide awareness of the fact that during the 25 years of its existence, the NSG has significantly contributed to strengthening the nuclear nonproliferation regime to the benefit of global and regional stability. Russia is further aware that it would be wrong to regard the NSG as an elite club of developed economies established to prevent access by other states to advanced technology. States party to the NSG try to maintain relations with non-members on a non-discriminatory basis and do not impede mutually beneficial cooperation in the area of peaceful nuclear energy uses.

Taking into account the aforementioned factors, thorough and unbiased study of the history of international nuclear export regulations is of high theoretical, historical and practical importance, since it may help to eliminate the flaws of the regime and explore the opportunities for further strengthening existing export controls. The book is based on archives, available research materials, and the author's personal recollections as well as recollections of other contemporaries. The author took part in conferences and negotiations that led to adoption in 1977 of the Guidelines for Nuclear Transfers.

The author is extremely grateful for the valuable advice and comments made by his colleagues, who read the manuscript of this study or some of its sections and shared some of their recollections. He would like to express his particular appreciation to Marina Belyaeva, Andrei Belyakov, Bertrand Goldschmidt, Piet de Klerk, Alexander Rogov, Fritz Schmidt, Vladimir Shmelyev, Charles Van Doren, and Andrei Zobov.

Many thanks to the officials of the Historical and Documentation Department of the Russian Ministry of Foreign Affairs, who facilitated the author's access to archives -- Peter Stegnyy, Alexei Dulyan, Elena Belevich, Nadezhda Mozzhukhina, Sergei Pavlov, and Nikolai Kochkin.

CHAPTER I. NPT PROVISIONS CONCERNING NUCLEAR EXPORT CONTROLS

A number of states applied national export controls to nuclear material, equipment, and technology from the very beginning of the nuclear age. The USSR had export control regulations at the level of ministries and agencies. Before the development of the IAEA safeguards, the USSR did not require controls of nuclear material supplies and equipment under the agreements on peaceful uses of nuclear energy with other states, but did insist upon the return of all spent fuel. The USA used its own control procedures with its recipient states. There also existed international regimes of a limited and consultative character, such as the COCOM founded by the USA and some other Western countries in 1949-1950 to supervise sensitive technology supply to the Communist bloc³.

In this book we do not deal with numerous cases of assistance provided by certain nuclear weapon and some non-nuclear weapon states to other countries in developing nuclear weapons, despite the existence of restrictive national legislation and norms (e.g. the US aid to Great Britain, the Soviet assistance to China, French help to Israel, Canadian assistance to India, West German aid to South Africa, Chinese supplies to Pakistan, etc.)⁴.

In the beginning of the nuclear age, the world did not realize the importance of collective measures to prevent the further spread of nuclear weapons. Only in the early 1960s, when the UN General Assembly passed the so-called *Irish Resolution*, did the international community come to a consensus about the advisability of concluding a legally-binding international agreement on nuclear nonproliferation⁵.

The 1968 NPT was the first treaty to establish international law regulations concerning nuclear export. Article III (2) contains the following important provision:

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

³ In 1994, when the Cold War had ended, the COCOM was disbanded. Since 1996, there has been existing Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies. The agreement unites more than 30 states, including Russia.

⁴ See: Timerbaev R.M. Russia and Nuclear Nonproliferation. 1945-1968. M., Nauka, 1999, pp.118-135.

⁵ Ibid., pp.163-186.

This provision of the treaty was rather quickly approved by the USA and the USSR in the beginning of bilateral negotiations on the NPT in late 1966 in New York, whereas other major provisions of Article III concerning safeguards were far from being agreed upon. The aforementioned paragraph charges with responsibility both nuclear weapon states and non-nuclear weapons states. At the same time, it relates to the export of material and equipment to any non-nuclear weapon state, regardless of its accession or non-accession to the NPT. According to one of the participants of the NPT negotiations Marat Antyasov, «this provision is absolutely correct, otherwise the non-parties to the treaty would have found themselves in a privileged position. The requirement of non-nuclear weapon states importing nuclear material to accept safeguards for the supplied material promotes the extension of the IAEA safeguards to cover even those states that are not parties to the NPT»⁶.

To understand what sort of material is subject to restrictions, one should bear in mind that paragraph 2 of Article III speaks about equipment and material especially designed *or* prepared for the processing, use or production of special fissionable material. Hence, the treaty implies a wider range of equipment and material subject to control, than if they were both designed *and* prepared for the processing, use or production of special fissionable material.

Some experts believe that Article III (2) provides for full-scope safeguards in the recipient state. This opinion is shared, for instance, by Fritz Schmidt (Austria), who is presently chairing the *Zangerger Committee*⁷, whose activities will be described in some detail below. However, this point of view is incorrect. Founders of the NPT clearly stated in paragraph 2 that the safeguards under Article III cover only supplied material and equipment and this was a deliberate step.

Article III (2) sets forth that parties to the treaty undertake not to provide specified material and corresponding equipment to any non-nuclear weapon state if this material is not subject to «the safeguards required by this article».

Any special interpretation of this provision was not negotiated during the NPT talks, since there was no need for it (though for some other provisions of the treaty interpretations and common understandings were fixed in the records of negotiations held by the Committee on Disarmament in Geneva). The text of the article clearly indicates that only *supplied* material is subject to the safeguards. During the US-Soviet talks in 1966-1967, the parties discussed the

⁶ Morokhov I.D. (Ed.). *Atom and Peace. NPT and IAEA*. M., Mezhdunarodnye otnosheniya, 1974, p.34 (in Russian).

⁷ Schmidt Fritz W. *The Zangerger Committee: Its History and Future Role. The Nonproliferation Review*, No.1, Vol.2, Fall 1994., pp.43-44; *The Role of the IAEA in Nuclear Export Control. Presentation at the International Seminar on the Role of Export Controls in Nuclear Non-Proliferation*. Vienna. 7-8 October 1997.

possibility of including in the text a demand for full-scope safeguards for nuclear supplies. However, later the parties rejected this proposal, for it may have been unacceptable to important developed non-nuclear weapon states, such as West Germany, Japan, Canada, etc., which were entering the world nuclear market at that time. When the joint draft of the treaty was submitted to the Geneva Committee on Disarmament (in 1967) and then to the UN General Assembly for approval (in 1968), no delegation raised the issue of any interpretation of this article.

The wording «safeguards required by this article» used in Article III (1) and designed for non-nuclear weapon states participating in the NPT does not mean that this provision can be applied to non-parties as well.

This omission was confirmed by further developments. When the treaty entered into force, in 1970-1971, the IAEA worked out safeguards for non-nuclear parties to the NPT. This document (INFCIRC/153) was adopted by the Agency's Board of Governors and is called «The Structure and Content of Agreements Between the Agency and States Required in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons». And it has the following subtitle: «The Board of Governors has requested the Director General to use the material reproduced in this booklet as the basis for negotiating safeguards agreements between the Agency and non-nuclear-weapon states parties to the Treaty on the Nonproliferation of Nuclear Weapons». Thus, this decision by the Board of Governors clearly establishes that the required safeguards relate only to non-nuclear parties to the treaty. As far as other non-nuclear weapon states are concerned, which are not included in the NPT, they are subject to a different system of IAEA safeguards designated for specific plants and material (the system was approved by the Agency in 1965, INFCIRC/66/Rev.2).

When in 1975-1977 the NSG was preparing the Guidelines for Nuclear Transfers, the proposal put forward by some states (the USSR and Great Britain) to require the implementation of full-scope safeguards as a condition to supplying non-nuclear states nuclear materials, equipment, and technology was rejected due to the negative attitude of West Germany, France, and Japan. The principle of full-scope safeguards as an indispensable condition of supplying was approved by the NSG in 1992. By that time, the overwhelming majority of states had joined the NPT and had committed to full-scope safeguards. Nonetheless, even nowadays, some suppliers party to the NPT, but not participating in the NSG (e.g. China) do not accept this principle.

Article III (2) of the NPT set general international legal norms of nuclear export controls and left for the future all further specification and improvement of such regulations.

Besides, this article did not provide for full-scope safeguards in recipient states and required elaboration of some additional terms of export. According to Carlton Thorne, the US expert on export controls, the provisions of the NPT «is also a reflection of a more simple world, a world where only five states knew how to build nuclear weapons and the problem for all others was to be solved by preventing them from acquiring weapons grade material»⁸.

The NPT did not directly forbid non-nuclear weapon states from assisting other non-nuclear powers in the acquisition and production of nuclear weapons and other nuclear explosive devices, though the spirit of the treaty prevented them from doing this. The NPT did not envisage control over nuclear technology. It covered the export of nuclear reactors or other nuclear equipment but information about the design of a reactor or equipment was not subject to the provisions of Article III (2). The treaty did not provide for control over the export of non-nuclear items required for designing and manufacturing explosive devices (i.e. in did not explicitly prevent weaponization). The NPT did not regulate re-export issues, it did not provide for the appropriate physical protection of nuclear material and plants, nor did it cover relevant dual-use technologies and items.

All these shortcomings were realized soon after the treaty entered into force. Since the procedure for amendments was quite complicated (Article VIII (1, 2) and it was practically impossible to pass them, this drawback did not mean that the treaty regime could not be upgraded in some other way. There were other opportunities to specify and adjust commitments of nuclear and non-nuclear powers on export controls and on strengthening nuclear nonproliferation. And this work began soon after the treaty entered into force in 1970, when the *Zangger* Committee was established.

Another critical issue to be taken into account in the process of developing specific norms of nuclear export was the objectives of nuclear nonproliferation, in the first instance, but also to a certain extent (and not to the detriment of the nonproliferation regime) the natural interests of the exporters in the development of the world nuclear market.

Obviously, as science and technology develops and new nuclear technologies emerge, there may appear some other aspects requiring appropriate legal regulation at the international level.

⁸ Thorne Carlton E. Op.cit., p.27.

CHAPTER II. THE ZANGGER COMMITTEE

After the conclusion of the NPT, the existing system of IAEA safeguards applied to individual nuclear facilities -- nuclear power plants (NPPs), nuclear fuel fabrication plants and spent fuel reprocessing plants, etc. (INFCIRC/66/Rev.2) was to be complemented with a system of safeguards adjusted to the treaty's provisions. According to Article III (1), these safeguards were aimed at supervising all peaceful nuclear activities of non-nuclear parties to the NPT. This system was worked out in 1970-1971 by the IAEA Safeguards Committee and approved by the Board of Governors as a model agreement on safeguards for non-nuclear weapon states party to the NPT published as INFCIRC/153 (Corrected).

The next stage of developing provisions of the treaty were activities under Article III (2). For that purpose, on March 11, 1971, a group of Western states -- suppliers and potential suppliers of nuclear material and equipment and participants of the NPT -- gathered in Vienna under the chairmanship of Prof. Claude Zangger (Switzerland) for an informal and confidential exchange of opinions on how to implement the aforementioned article. They reached an agreement on the following issues:

- to work out the definition for «equipment and material especially designed or prepared for the processing, use or production of special fissile material», i.e. to draw a list of goods subject to international export controls;
- to establish terms and procedures guiding the export of such equipment and material to fulfill the commitments under Article III (2) on the basis of fair international commercial competition, i.e. to approve certain mutual constraints in this area.

The parties also agreed that the list would contain specific nuclear end-use articles, but would not comprise dual-use items that might be subject to the provisions of Article III (2). The participants decided that the group would have informal status and its decisions would not be legally-binding for its members.

In 1972, the parties to the *Zangger* Committee reached a tentative agreement on all aforementioned tasks («Expurgated Version» of September 27, 1972). This version was a compromise between the USA and its European partners. The USA had first suggested a more detailed list based on the US domestic legislation, which was not backed by the Europeans.

The USSR did not participate in the work of the *Zangger* Committee in the initial stage, but maintained bilateral contacts with the USA concerning the

implementation of Article III (2). The Soviet Union insisted on official regulations in the form of an IAEA document concerning Article III (2), just as it had been done with Article III (1) (INFCIRC/153). According to Igor Morokhov, First Deputy Chairman of the State Committee on Utilization of Atomic Energy of the USSR (he was also Deputy Minister of Minsredmash -- predecessor of Minatom), in his conversation with British Embassy Counselor in Moscow Garret on February 16, 1973, the Soviet Union did not deny the results of the *Zangger* Committee activities, but believed that such results should be submitted to the IAEA and obtain the status of the Agency's documents. At the same time, he said that it was not necessary to pass them through the Safeguards Committee (as it had occurred with INFCIRC/153), for they could be prepared by the IAEA Secretariat and approved by the Board of Governors⁹.

On February 26-27, 1973, the USSR and the USA held consultations in Vienna on the implementation of Article III (2). The Soviet Union was represented by counselors of the Soviet Mission to the IAEA Igor Palenykh and Boris Kuvshinnikov, and by Vladimir Shmelyev (Minsredmash). The USA informed the Soviet delegation that all members of the *Zangger* Committee regarded the elaboration of the Trigger List as an interpretation of the NPT and the IAEA had no right to interpret the treaty and, hence, to compose such a list. They proposed to approve the list and to send it to the IAEA Director General to circulate the text to all member states of the Agency. The US explanations indicated that it would be quite difficult to submit the list to the Agency's approval, since in the process of discussing it within the Agency framework, recipient states would strive to make it shorter, besides the fact that not all IAEA members were parties to the NPT.

The Soviet delegation put forward its own more detailed list, but the USA argued that an expansion of the list would throw negotiations back 18 months. The US officials maintained that the agreed list would have to be a compromise, but each state would have the right to apply its own norms and criteria to supplies of material and equipment, i.e. to go beyond the agreed list¹⁰.

As a result of further activities of the *Zangger* Committee and bilateral contacts among nuclear suppliers, the parties agreed upon two memoranda of August 14, 1974. Memorandum A covered the export of «source or special fissionable material» (sub-paragraph «a» of Article III (2)), while Memorandum B dealt with the export of «equipment and material especially designed or prepared for the processing, use or production of special fissionable material» (sub-paragraph «b» of the same article). These two memoranda constituted the Trigger List, i.e. the list of items subject to safeguards. In addition to this list,

⁹ The author's personal archive.

¹⁰ The author's personal archive.

the parties adopted Clarifications to the Trigger List, which contained more detailed characteristics of nuclear equipment.

As for applying safeguards to exported material and equipment, the agreed upon understandings maintained that to supply non-nuclear weapon states, which were non-participants of the NPT, with such material and equipment, the state-exporter should a) specify to the recipient that, as a condition of supply, the source or special fissile material shall not be diverted to nuclear weapons nor to other nuclear explosive devices; and b) satisfy itself that safeguards to that end, under an agreement with the Agency and in accordance with its safeguards system, will be applied to the source and special fissile material in question.

The documents of the *Zangger* Committee did not specify which system of IAEA safeguards should be applied to non-nuclear weapon states not participating in the NPT (INFCIRC/66 or INFCIRC/153). At some point a possibility of preparing a draft agreement on safeguards for material and equipment supplies to such states on the basis of INFCIRC/66 was explored with additional provisions to the effect that IAEA safeguards would last until such material or equipment was contained in the IAEA inventory list in accordance with INFCIRC/66. Signing such an agreement with Switzerland, which at that time was not party to the NPT (it joined the treaty in 1977), was proposed so that after its approval by the Board of Governors it might have been recommended that the Agency secretariat follow its provisions.

The idea of elaborating a special agreement on safeguards related to non-nuclear weapon states who had not signed the NPT was not actualized and, in practice, the member states used INFCIRC/66. In February 1974, the Board of Governors decided that such safeguards would be applied throughout the entire term of the actual use of the material or equipment in the recipient state.

Along with specifying provisions of sub-paragraphs «a» and «b» of Article III (2), the 1974 agreements contained some additional commitments not stated in Article III (2), such as:

- the government of a supplying state shall require from the recipient, as a condition of supply, assurances that the supplied material and equipment shall not be diverted to the manufacture of nuclear weapons or other nuclear explosive devices¹¹;

¹¹Such wording about preventing diversion of nuclear material from peaceful uses to nuclear weapons or other nuclear explosive devices is included in Article III (1) of the NPT related to commitments of non-nuclear weapon states parties to the treaty to accept safeguards and to apply them within the territory of such states to all peaceful nuclear activities.

- in the case of the retransfer of nuclear material and equipment, the government of a supplying state shall require from the government of a recipient state assurances that the Trigger List items shall not be re-exported unless the recipient state accepts safeguards on the re-exported items;
- the Trigger List would include some non-nuclear materials for reactors, such as deuterium, heavy water and graphite of a certain level of quality.

Understandings reached in the *Zangger* Committee, to which the USSR acceded followed later by some East European nations, took the form of an exchange of individual notes among nuclear suppliers. This correspondence, in fact, meant that these unilateral statements would be followed by corresponding national legislation or other national norms or rules.

Ten governments of nuclear suppliers, including the USSR, sent identical letters stating these agreements to the Director General of the IAEA on August 22, 1974. Later, several other states acceded to these agreements. The aforementioned letters and memoranda were issued as INFCIRC/209 on September 3, 1974.

After approving the initial agreements, the *Zangger* Committee continued to complement and upgrade the Trigger List and included a few other export control commitments. In 1978, the Trigger List was expanded to include equipment for the production of heavy water and deuterium and the uranium fabrication plants of the gaseous diffusion type. In 1984, the list was further broadened to encompass gas centrifuge equipment, in 1985, plants for the reprocessing spent nuclear fuel and the separation of plutonium, in 1990, additional equipment of the gaseous diffusion type, etc. The committee's activities continue nowadays, it convenes regular meetings to provide for consultations and exchange of information¹².

The three NPT depositaries -- the USSR, the USA, and the UK -- agreed to take an additional useful step to promote the transparency of nuclear exports in July 1974. The decision maintained that the IAEA should be notified in due time of the transfer of nuclear material to any non-nuclear weapon state if its amount exceeded one effective kilogram¹³.

¹²About the work of the *Zangger* Committee see: Schmidt Fritz W. Op.cit.; Schmidt Fritz. *Zangger* Committee. Presentation at the 2nd International Seminar on the Role of Export Controls in Nuclear Non-Proliferation. New York. 8 - 9 April 1999, pp.23-34.

After Zangger's resignation in 1989, the Committee was headed by Ilkka Makipentti (Finland) -- 1989-1993. Since 1993, it is chaired by Fritz Schmidt (Austria). Functions of the Committee's secretariat are performed by the British Mission to the Agency.

¹³INFCIRC/207. For definition of the effective kilogram see the Glossary of Terms.

A letter sent by Georgy Arkadyev, the Soviet Permanent Representative to the International Organizations in Vienna, to Sigvard Eklund, the IAEA Director General, on July 10, 1974, informed the latter that the Soviet Government would provide the Agency with the following data on a permanent basis:

«1. In part, pertaining to the proposed export of nuclear material supplies (excluding the export of initial materials for non-nuclear goals) in an amount exceeding one effective kilogram for use in peaceful pursuits to any non-nuclear weapon state:

«a) about the organization or company which will prepare the nuclear materials for export;

«b) both the description and, if possible, the proposed components and amounts of nuclear material in the proposed export;

«c) information about the state and organization or company, which should install the nuclear materials, and, if required, (for example in the case of when nuclear material are reprocessed further in some other state, before it is sent for re-transferred to a third country), information about the state and organization or company of the final destination. The aforementioned information will be given at least ten days before export from my country. Included will be a confirmation of each delivery, including the actual amount, the components, and date of dispatch. The materials will be sent immediately following the dispatch.

«2. In part, pertaining to any import of nuclear material of an amount exceeding one effective kilogram, which is under the safeguards agreed upon with the IAEA and is located in the state from which the material will be imported:

«a) information about the state and organization or company from which the nuclear material will be imported,

«b) information regarding the description, the components, and the amount of the nuclear material».

According to the letter, this exchange of information should have begun no later than October 1, 1974¹⁴.

France joined this agreement of the nuclear weapon states in 1984, and China -- in 1991.

¹⁴Archives of the Russian Foreign Policy. F.47, op.20, p.179, d.56, ll.90, 91.

CHAPTER III. REASONS FOR TIGHTENING EXPORT CONTROLS

Even before the *Zangger* Committee finished its work on the 1974 initial agreements, it had become obvious that the existing norms and rules of control over nuclear exports were not sufficient and needed to be strengthened to prevent further proliferation of nuclear weapons and other nuclear explosive devices.

The most important reason for this realization was the May 1974 nuclear test by India at the Pokhran test site, which was alleged to be «a peaceful nuclear explosion». In 1955, Canada proposed to build in India a heavy-water nuclear reactor working on natural uranium. CIRUS (Canadian-Indian Reactor Uranium System) had 40-MW capacity. Plutonium used for development of nuclear explosive device was produced by this reactor, which reached criticality in July 1960. Ottawa did not require that any safeguards be applied to this reactor, except asking that Indian commitment be stated in a classified appendix to the agreement saying that the reactor and fissile material produced by it would be used for peaceful purposes only¹⁵.

To «legitimize» the use of plutonium produced by the reactor for their own purposes, including nuclear explosions, Indian experts made indigenous uranium fuel assemblies for the first fuelling of the reactor in 1960. Simultaneously, in 1958, at the initiative of the head of the Indian nuclear program Homi Bhabha, New Delhi was constructing in Trombay a plant for reprocessing spent CIRUS fuel. The plant was called *Phoenix* and produced the first batch of weapons-usable plutonium in 1964.

Having been informed that India was planning its first nuclear test, the USA addressed the Indian government in a memorandum on November 16, 1970, stating that Washington would regard a nuclear explosion using CIRUS fuel and US-supplied heavy water as moderator as a violation of the 1956 US-Indian cooperation agreement on peaceful nuclear energy uses. The memorandum maintained that there was no difference between peaceful nuclear explosive device and a nuclear weapon. Indian authorities denied this assertion and argued that India had the right to any use of nuclear energy, including manufacturing of peaceful nuclear explosive devices¹⁶.

The new Director of the Indian Atomic Energy Commission Vikram Sarabhai announced in September 1971 at the Fourth International Conference on the

¹⁵Timerbaev R.M. Op.cit., p.155; Perkovich George. *India's Nuclear Bomb. The Impact on Global Proliferation.* Berkeley, Los Angeles, London, University of California Press, 1999, p.27.

¹⁶Perkovich George. Op.ñit., p.159.

Peaceful Uses of Atomic Energy in Geneva that Indian scientists were developing nuclear explosive engineering (i.e. peaceful nuclear explosives). Following this declaration, Canadian Prime Minister Pierre Trudeau sent a letter of October 1, 1971, to Indian Prime Minister Indira Gandhi declaring that «the use of Canadian supplied material, equipment and facilities [...] for the development of a nuclear explosive device would inevitably call on our part for a reassessment of our nuclear cooperation arrangements with India». In her response Indira Gandhi denied Canada's right to unilaterally interpret the cooperation agreement, but at the same time, to mitigate the situation, she admitted that it was the matter of «hypothetical contingency»¹⁷. Obviously, this was merely deception; by late 1971, the development of the explosive had been nearly completed. In 1972, India started to prepare the test range for an underground nuclear explosion¹⁸.

After the Indian test, in 1975, the US administration admitted before the Senate that plutonium used by India for the nuclear explosion was produced with the help of US-supplied heavy water¹⁹. As a result, in June 1976, the Congress passed the Symington Amendment to the Foreign Assistance Act banning economic or military assistance to any state importing uranium enrichment technology or chemical processing technology if that country did not apply the IAEA safeguards to all its nuclear facilities²⁰.

Another factor forcing the nuclear exporters to review and tighten export controls were negotiations between Brazil and Germany on nuclear matters, which, in June 1975, finally resulted in a broad agreement. According to this document, Brazil was to acquire eight 1300-MW power reactors, a pilot plant for plutonium separation, and a uranium enrichment plant (jet nozzle separation). According to the Soviet Embassy in Brazil, the Brazilian Foreign Ministry announced the deal and emphasized that the aim of cooperating with the Federal Republic of Germany was to gain autonomy in the important area of nuclear energy production²¹.

¹⁷Ibid., p.159.

¹⁸In 1963, India acceded to the Limited Test Ban Treaty, that banned nuclear weapon tests in the atmosphere, in outer space and under water.

¹⁹Perkovich George. Op.ñit., p.198.

²⁰It is noteworthy that initial reaction of nuclear weapon states to the first Indian explosion was quite moderate (unlike the negative reaction to the May 1998 tests). Moscow and Beijing confined themselves to publishing just the news about the peaceful nuclear explosion. The US State Department prepared statement with harsh criticism of Indian steps and accused it of undermining international nuclear nonproliferation efforts. However, Secretary of State Henry Kissinger preferred to make a more neutral statement. As for France, its Commissariat a l'energie Atomique sent a congratulatory message to the Indian Atomic Energy Commission. (Perkovich George. Op.ñit., p.183. According to Bertrand Goldschmidt, this message was not coordinated with the French Foreign Ministry). However, afterwards the Indian explosion was one of the factors making nuclear exporters, including France, take measures to tighten nuclear export controls.

²¹Archives of the Russian Foreign Policy. F.47, op.21, p.189, d.49, l.91.

A matter of grave concern was construction of plutonium and uranium production facilities, since their availability would enable Brazil to manufacture weapons-grade fissile material -- both plutonium and highly enriched uranium -- and to possess a complete fuel cycle²². At the same time, it was taken into account that Brazil was not a participant of either the NPT or the Tlatelolco Treaty establishing a nuclear-weapon-free zone in Latin America²³.

Washington made persistent top-level efforts to prevent the deal. President Jimmy Carter sent his Vice President, Walter Mondale, to Bonn to meet with Chancellor Helmut Schmidt. At the same time, Deputy Secretary of State, Warren Christopher, visited Brazil. However, the FRG resisted pressure and only the Brazilian economic depression forced the nation to downsize its nuclear program. Jet nozzle technology turned out not to be cost-efficient and Brazil eventually abandoned it. However, work with this enrichment technology enabled Brazil to acquire valuable know-how and the experience of using UF₆ for centrifugal enrichment in a program developing simultaneously which was not covered by international safeguards²⁴.

Another important reason for additional export control restrictions was Pakistan's plans to develop nuclear weapons with the help of foreign assistance. After defeat in the 1971 war with India, Prime Minister Zulfikar Bhutto decided to develop an A-bomb and commenced negotiations with France on purchasing a plutonium reprocessing and fabrication plant. However, Pakistan only managed to raise the necessary funds after the 1974 Indian explosion.

Although France, which at the time was not a signatory to the NPT, strove to place the plant and any related French technology under the IAEA safeguards, the facility would have enabled Pakistan to produce plutonium. It was only natural to ask for what Pakistan needed this plutonium, since it had only one small natural uranium power reactor.

In 1976, President Gerald Ford sent Secretary of State Henry Kissinger to Islamabad and Paris to derail the deal, but his mission failed. In March 1976, France and Pakistan signed the appropriate agreement. On August 25, 1976, French Foreign Minister Jean Sauvagnargues confirmed French intentions to

²²Timerbaev R.M. Op.cit., pp.160, 161; Spector Leonard S. with Smith Jacqueline R. Nuclear Ambitions. A Carnegie Endowment Book. Boulder, San Francisco, Oxford, Westview Press, 1990, p.243. However, the planned program was implemented only partially. Out of eight Siemens power reactors, only one became operational -- *Angra I* (626 MW). The second reactor -- *Angra II* (1300 MW), whose construction started in 1977, is to be integrated into the energy system in 2000.

²³Brazil signed and even ratified the Tlatelolco Treaty but made no waiver under Article 28, paragraph 2, providing for the treaty's entry into force on its territory. This statement was made later - in the 1990s.

²⁴Fischer David. Op.ñit., ð.263.

sell Pakistan a spent fuel reprocessing plant, despite continuous US objections²⁵.

However, in 1977, when the French government decided to participate in international nuclear export control efforts, Paris stopped supplying nuclear equipment to Pakistan. One of the decisive factors for this termination was that the USA made the French aware of Pakistan's true intentions by providing intelligence data to France. France was also informed that reactor-grade plutonium could be used for a nuclear explosion²⁶. All this new information killed the deal²⁷. Nonetheless, Pakistan managed to obtain from France technical documentation for chemical processing technology. Meanwhile, the French government had to pay a large amount of money to the French firms to compensate for the disrupted deal²⁸.

Under these circumstances (starting in 1975), Pakistan had to find an alternative way to purchase equipment abroad (including smuggling in violation of export control legislation) and to acquire gas centrifuge uranium enrichment technology. For its enrichment plant in Kahuta, Pakistan imported from West Germany in 1977-1980 equipment to make an entire plant for UF₆ production. Abdul Qadeer Khan, a Pakistani specialist educated in West Germany, who worked for some time at the Anglo-German-Dutch uranium enrichment plant in Almelo (the Netherlands) played a key role in the HEU production program development²⁹.

France was also planning to supply South Korea with a spent fuel reprocessing plant. The French Ministry of Industry accomplished such a deal, but under US pressure (Henry Kissinger visited Seoul for that purpose), Korean President Park Chung Hee had to refuse the plant construction in early 1976³⁰.

Taiwan was going to strengthen its positions in the face of the Chinese threats and turned to France with an offer to purchase irradiated fuel reprocessing technology. At the same time, Taiwan addressed Great Britain with an offer to reprocess its irradiated fuel in the UK in exchange for returning to Taiwan plutonium separated from this fuel.

²⁵*International Herald Tribune*, 26 August 1976.

²⁶In 1962, the USA conducted a nuclear test of the explosive device which used reactor-grade plutonium.

²⁷Spector Leonard S. with Smith Jacqueline R. *Op.cit.*, p.90; Perkovich George. *Op.ñit.*, p.429.

²⁸Fischer David. *Op.ñit.*, ðp.261, 262.

²⁹*Ibid.*, pp.90, 91; Timerbaev R.M. *Op.cit.*, p.157.

³⁰Timerbaev R.Ì . *Op.cit.*, pp.149, 150.

In the late 1960s -- early 1970s, South Africa received secret aid from Germany (the West German company -- STEAG) to develop a uranium enrichment plant in Valindaba (*Y-Plant*), which became operational in April 1975 and reached full capacity several years later. The plant was not covered by the IAEA safeguards and it served as a source of weapons-usable uranium for a few nuclear explosive devices. In mid-1977, the Soviet intelligence satellite detected the construction of a test site in the Kalahari Desert, and the USSR informed the US administration. As a result, Washington and Moscow took diplomatic measures to force Pretoria to refrain from carrying out tests. In addition, the UN, at this time, was actively discussing reports regarding nuclear cooperation between South Africa and Israel³¹.

In response to challenges originating from Israel and Iran, Iraq, with French assistance, was actively developing the capability for plutonium production.

Another matter of concern was a non-safeguarded Spanish gas-cooled graphite-moderated reactor, Vandellós, built with French assistance in 1972. This reactor used natural uranium supplied by France and had a 500-MW capacity. According to the IAEA experts (and information from the Soviet Resident Representative in Vienna of December 1975), this reactor could annually produce about 150 kg of plutonium with a high isotopic concentration of Pu-239³². The safeguards agreement was signed with the Agency in 1981, whereas Spain joined the NPT in 1987 only.

Finally, another significant argument in favor of new collective agreements (and some experts believe this to be a factor of the utmost importance) was the need to involve France, a large nuclear exporter which was neither party to the NPT nor a member of the *Zangger* Committee, in international efforts to strengthen export controls.

All of this occurred in the situation of a deep energy crisis of 1973-1974. The oil embargo imposed by Arab oil producers in October 1973 during the Middle East war significantly increased oil prices³³ and provided for a growing interest in nuclear energy to ensure self-sufficiency in this area with the help of self-produced plutonium. *Foreign Affairs* published in 1974-1975 a series of articles by authoritative US politicians and experts. One of them maintained that as a result of the oil embargo, the states began to realize that «possession of nuclear

³¹Spector Leonard S. with Smith Jacqueline R. Op.cit., pp.270-273; Jones Rodney W., McDonough Mark G. with Dalton Toby F. and Koblenz D. Tracking Nuclear Proliferation. A Guide in Maps and Charts, 1998. Carnegie Endowment for International Peace, Washington D.C, p.243; NPT: Problems of Extension. Foreign Intelligence Service of the Russian Federation, M., 1995, p.66 (in Russian).

³²Archives of the Russian Foreign Policy. F.47, op.21, p.189, d.49, l.165.

³³From \$2.50 to \$11 per barrel.

reactors without control of nuclear fuel gives only illusory energy independence. Independent and diversified sources of nuclear fuel are, therefore, sought». Another expert stated that, «the spread of nuclear reactors has thus taken a wholly new dimension». A third, that «predictions of numbers of future nuclear power plants now far exceed the figure planners had been using prior to the Arab oil embargo of 1973-1974», and so on and so forth³⁴.

The authors of these articles emphasized that existing nonproliferation mechanisms were not adjusted to changing technologies. Senator Adlai Stevenson (the son of a prominent politician who was Democratic nominee at the 1952 presidential elections and the US permanent representative to the UN) published a program article and set forth a number of proposals to strengthen the nonproliferation regime. He wrote:

«Nuclear-exporting nations will be reluctant to forgo the opportunity they now see to serve their immediate self-interest in new and bigger markets [...] The conventional wisdom agrees that the United States should accelerate its nuclear sales effort [...] The conventional wisdom is a prescription for the escalation of proliferation».

Stevenson suggested that a one-year moratorium on nuclear fuel and technology supplies be announced, making an exception only for those states, whose peaceful nuclear activities were under safeguards. He also proposed to «immediately begin an intensive effort through concerted international action to develop and implement improved safeguard and security systems». Another idea was to establish sanction mechanisms and for nuclear suppliers -- the USA, Canada, France, Great Britain, the USSR and West Germany -- to «agree on uniform standards and be prepared to enforce them».

Stevenson's concept in fact predetermined the basis for an international export control regime: «The present institutional arrangements, which include both suppliers and recipients, are too heavily biased in favor of recipient nations to expect anything but minimal standards. Membership in the supplier club should not be left open lest it encourage applications». In conclusion, he wrote that «supplier nations must take all steps necessary, however unpalatable they may be to recipients».

It is noteworthy that Senator Stevenson's article in *Foreign Affairs* coincided with the commencement of consultations between the USA and the Soviet Union in late 1974 on tightening nuclear export controls.

³⁴Stevenson Adlai E. III. Nuclear Reactors: America Must Act., Qvester George H. Can Proliferation be Stopped? *Foreign Affairs*, October 1974, pp.64-76 and 77-97; Bloomfield Lincoln P. Nuclear Spread and World Order. *Foreign Affairs*, July 1975, pp.743-755.

The Soviet Union kept an eye on all developments threatening the efficiency of the NPT and took these developments into account in the process of coordinating international actions to tighten export controls. A matter of grave concern for Moscow was the activities of Western developed economies trying to conquer nuclear equipment and technology markets to the detriment of nuclear nonproliferation. Above all, this was true with respect to companies from West Germany with their aggressive marketing strategy in Latin America and South Africa and to French atomic industry, which was striving to gain strong positions in the Middle East, Pakistan and East Asia. The FRG became a full-fledged party to the NPT only in May 1975, whereas France delayed this process until early 1990s.

The NPT Depositaries -- the USSR, the USA and Great Britain -- had similar positions concerning the advisability of taking additional measures to enhance the efficacy of the treaty and the entire nuclear nonproliferation regime. This similarity in views significantly contributed to successful endeavors to work out international nuclear export control norms.

A peculiarity of the Soviet position at the initial stage -- during the 1971-1973 period of the *Zangger* Committee activities -- was Soviet apprehension that any agreements among exporters without IAEA decisions would result in Western domination and would alienate Third World states from concerted efforts to strengthen nonproliferation. However, very soon Moscow realized that attempts by exporters and importers to work out mutually acceptable export control norms were unrealistic and would have only hampered measures to enhance the NPT efficiency. That is why, when the issue of establishing the NSG emerged, the USSR together with the USA and the UK led the process of organizing such a group.

CHAPTER IV. PRELIMINARY CONSULTATIONS AMONG NUCLEAR SUPPLIERS

In October-December 1974 at the Minsredmash (the predecessor of Minatom) in Moscow, the USSR and the USA held confidential consultations concerning possible steps to be taken by nuclear suppliers to tighten sensitive export controls and to work out additional measures to strengthen the international nuclear nonproliferation regime. The First Deputy Chairman of the State Committee on Utilization of Atomic Energy Igor Morokhov and Roland Timerbaev³⁵ of the MFA both represented the Soviet Union; Walter Stoessel, US Ambassador in Moscow represented the USA³⁶.

The fact that nuclear export control consultations were held in Moscow can be accounted for, to a large extent, by the mutual trust that was established between the parties during the Moscow negotiations on the Threshold Test-Ban Treaty (up to a yield of 150 kt) in June-July 1974 and the negotiations on the Peaceful Nuclear Explosions Treaty (started also in Moscow on October 7, 1974). During the negotiations on peaceful nuclear explosions, Soviet and American representatives discussed other nuclear issues of mutual interest on the side, including the nuclear nonproliferation agenda. In the course of numerous conversations, the parties agreed upon the advisability of collective endeavors of nuclear suppliers to tighten export controls.

At first, the USA tried to act on its own against India and other recipient states. In October 1974, Henry Kissinger exchanged views with Indira Ghandi and further discussions were continued by the US Embassy in New Delhi. Indians, however, confined themselves to an informal assurance that «at least they would not export nuclear explosive technology»³⁷. But soon Washington began to realize that a unilateral approach would only inflict damage on the US nuclear industry. On Kissinger's request, the US Arms Control and Disarmament Agency (ACDA) and the Foreign Policy Planning Division of the State Department prepared proposals backing the idea of multilateral export control agreement. They also urged the establishment of a body comprising all major nuclear exporters, including France, to elaborate joint measures to avoid gaps in the system of nuclear nonproliferation. Such loopholes in the regime had already helped India and other states to profit from foreign assistance and

³⁵At that time, Timerbaev was Deputy Head of the Department of International Organizations of the Soviet Foreign Ministry and was in charge of nuclear nonproliferation and nuclear arms control.

³⁶For the first time, these consultations were described in: Timerbaev Roland. A Major Milestone in Controlling Nuclear Exports. *Eye on Supply*, No.6, Spring 1992, pp.58-65.

³⁷Perkovich George. Op.ñit., p.193.

to develop nuclear explosive devices. Moreover, such states would have been able to provide such capabilities to other non-nuclear weapon states³⁸.

The consultations in Moscow finished with the parties' agreement to establish the NSG and to hold consultations with other key exporters concerning their participation in this group³⁹.

At the final meeting between Morokhov and Stoessel on December 19, in which Anatoly Belov of the Soviet MFA took part, the parties concluded that, besides the USSR and the USA, three other states -- Great Britain, Canada and FRG -- would agree to participate in the meeting of nuclear suppliers. Stoessel informed the Soviet officials that France and Japan did not give their consent, but the talks with them continued.

In the course of the meeting between Gerald Ford and Valéry Giscard d'Estaing in Martinique in late 1974, the US President proposed to convene a meeting of several developed states concerning new proliferation challenges. According to the Director of External Relations in the Commissariat à l'Energie Atomique (CEA), Bertrand Goldschmidt, the French President «consient de la gravité et de l'importance nouvelles du problème, accepta»⁴⁰. Nevertheless, though the meeting of the two presidents had a positive impact on the evolution of the French position, nuclear suppliers, at least the USSR, were not completely sure that France would attend the first NSG session in London.

The French decision to participate in joint measures of nuclear suppliers was significantly influenced by a number of Franco-US consultations held in late December 1974 and in early 1975. According to Goldschmidt, until December 1974, France had always refused to participate in any joint producers meeting aimed at creating a common policy on nuclear exports. France tried to preserve the freedom of export and act *in the spirit* of the NPT, but not *by the letter* of the treaty. Paris continued to offer its nuclear technology under the IAEA safeguards to some states hostile to the NPT, such as India and Pakistan.

³⁸Interview of the author with Charles Van Doren in May 2000. Van Doren prepared these proposals together with Jerry Kahan, an official of the State Department.

Perkovich writes (p.191) that «Kissinger convened a secret meeting in London of what became the Nuclear Suppliers Group». The USA played an important part in the establishment of the *London Club*, but the role of other states, above all the USSR and Great Britain, was no less significant. The USSR insisted on tightening export controls, actively contributed to convening meetings of suppliers and defended the strictest export control rules, including the principle of full-scope safeguards as a condition of export supplies.

³⁹The fact of taking decision on the NSG development in Moscow is reflected in the well known book by David Fischer concerning the history of the IAEA: «The USA and the Soviet Union agreed in Moscow in late 1974 to establish a Nuclear Suppliers Group (NSG) of governments that were, or were expected to become, exporters of nuclear materials or equipment» (Fischer David. Op. cit., §.98).

⁴⁰Goldschmidt Bertrand. Op.cit., p.420.

Goldschmidt paid particular attention to the visit to the USA by the head of the CEA Andre Giraud on December 12-18, 1974. Giraud was accompanied by some directors of the CEA departments, including Goldschmidt himself. French officials visited major US nuclear centers but did not discuss the issue of NSG establishment.

Following this tour, on January 12 and February 26, 1975, the parties held two rounds of consultations in Washington, which were attended by the head of a department in the French Foreign Ministry, Xavier de Nazelle, and Bertrand Goldschmidt. On January 24, in Paris, Andre Giraud met Chairman of the US Atomic Energy Commission Dixie Lee Ray. In the course of these consultations, the parties discussed French participation in the conference between the seven states on nonproliferation. Ms. Ray argued that, in the absence of France, this conference would not take place. Giraud explained the French position and assured her that France was keen on improving relations with the USA in the nuclear sphere. He also told Ms. Lee that, personally, he did not feel that France could participate in such a meeting without knowing in advance its conclusions, therefore, without having agreed first with Washington on them⁴¹.

Consultations with Britain took place in February 1975 during the Moscow visit of a governmental delegation headed by Prime Minister Harold Wilson. On the eve of the visit, the parties agreed that they would discuss the new international situation in the area of trafficking in nuclear material and equipment. They concluded that, taking into account the importance of the issue, it was necessary to negotiate a joint Soviet-British declaration on nonproliferation of nuclear weapons, which was to be signed by Leonid Brezhnev and Harold Wilson. The British delegation included Director of the Disarmament and Nonproliferation Division of the Foreign Office John Thomson, with whom we had had negotiations and prepared a draft of the declaration. The document was approved by the parties and signed by the two leaders. The UK and the USSR also came to a preliminary agreement on convening in London in spring 1975 -- the first meeting of key nuclear suppliers.

In the joint declaration of February 17, 1975, the parties underscored their commitment to the important goals of the NPT, calling for strict compliance with the treaty and for the widest possible accession to the treaty by other states. The latter statement was a clear hint for India and other states with

⁴¹This information was provided to me by Bertrand Goldschmidt in June 2000, and I would like to express my whole-hearted gratitude to him for his kind contribution to my research of the NSG history.

nuclear capabilities, which had not joined the NPT yet, to join. The declaration maintained:

«The parties are convinced that further steps can be undertaken with the goal of supplying non-nuclear weapon states with nuclear materials, equipment, and information for peaceful uses». However, it is especially emphasised in the declaration, «such steps should be implemented through the effective safeguards of the IAEA and they should not contribute in any manner to the proliferation of nuclear weapons. The parties express the hope that **all suppliers** [emphasis added -- **Auth.**] of nuclear materials and equipment will observe these safeguards applied by the IAEA in accordance with Article III of the NPT»⁴².

Moreover, in the course of the visit, the parties adopted a joint protocol on consultations providing for consultations on arms limitation and disarmament, «including measures on the **full** [emphasis added -- **Auth.**] implementation of the NPT»⁴³.

⁴²*Pravda*, 19 February 1975. See: Collection of major documents on disarmament. Vol. XVII. M., MFA of the USSR, 1975, pp.372, 373 (in Russian).

⁴³*Ibid.*, p.369.

CHAPTER V. THE *LONDON CLUB* ACTIVITIES⁴⁴

The first meeting of the major nuclear suppliers was held in London in April 1975. It was attended by seven delegations -- from the USSR, the USA, Great Britain, France, FRG, Japan and Canada. The meeting was chaired by John Thomson, who headed the British delegation. In 1975, the *London Club* conducted four such meetings -- in April, in June, in September and in November. The Soviet delegation was comprised of Igor Morokhov, Roland Timerbaev, Vladimir Shmelyev (Minsredmash) and Counselor of the Soviet embassy in Britain Yvgeny Rogov. Besides, in December 1975, a working group met to discuss technical issues, including amendments to the *Zangger* Trigger List, in which Shmelyev took part. Later on, the Soviet delegation was joined by two new members -- Michael Ryzhov (Minsredmash) and Anatoly Belov (MFA), while Shmelyev left, after he was appointed to the Department of Safeguards of the IAEA Secretariat.

The USA was represented by Director of the Bureau of Politico-Military Affairs of the US State Department George Vest, who headed a large delegation comprised of experts from the State Department, the Energy Research and Development Administration (ERDA) and ACDA. The delegation included such nonproliferation specialists as Lou Nosenzo, Nelson Sievering (later US Governor in the IAEA Board of Governors), Charles Van Doren, Harold Bengelsdorf.

The meetings of the *London Club* were held secretly in accordance with a prior agreement⁴⁵. However, the press managed occasionally to find out about the meetings of suppliers. For instance, on June 17, 1975, the *New York Times* wrote that the USSR, the USA, and some other nuclear exporters would meet in London on June 18 for a private meeting to discuss possible nuclear export control measures. Following this incident, the US State Department expressed concern that such publications could make some of the participants withdraw from the conference and refrain from cooperation.

This information caused some discontent among some of the Euratom states as well, in particular the Netherlands, which hosted the Anglo-German-Dutch joint enterprise for centrifuge uranium enrichment -- *Urenco*. The Dutch were

⁴⁴*London Club*, London Guidelines -- unofficial names of the NSG and Guidelines for Nuclear Transfers. At first, Britain was pleased that common export policy was associated with the British capital. However, when the NSG became more and more criticized by importers, British officials informed their colleagues that they would prefer to use official names of the organization and documents.

⁴⁵Alec Baer (former Deputy Director of the Swiss Federal Energy Department) believes that not only France, but the USSR insisted on secret character of talks, being afraid to lose prestige in the Third World states (Baer Alec. Op.cit., p.7). In reality, the Soviet delegation had no such instructions.

concerned about the fact that behind their back some states were making decisions regarding the control over the export of plants based on such sensitive technologies.

After the September 1975 meeting, bearing in mind the mass media's large interest in the *London Club* activities, the parties agreed upon a brief statement, which could be made by any official of the member state to the press. It said that due to multilateral and confidential character of talks the official could not give any details and could confirm only the fact of the meeting.

The most complicated and important issues for the NSG were the following:

Firstly, the achievement of the agreement on joint action to establish common terms of nuclear exporting. Agreeing to join the NSG implied the willingness to participate in joint efforts.

Secondly, the attainment of some common understanding of the principles of full-scope safeguards as a condition of being a supplier. At the time no agreement on this issue existed. The Soviet-British proposal to apply these principles to the supply of all items on the Trigger List failed to be passed. The discussion of the partial use of full-scope safeguards -- only in the transfers of the most sensitive material and equipment -- also gained no support. Thus, a requirement of full-scope safeguards was not included in the Guidelines for Nuclear Transfers at that time⁴⁶.

Thirdly, the establishment of a ban on the supply of sensitive technology (such as uranium enrichment, irradiated fuel reprocessing, plutonium separation and heavy water production). The *London Club* managed to come to a partial agreement on this matter -- a call to exercise restraint in such transfers.

Fourthly, the adoption of the Trigger List approved by the *Zangger Committee* as a mandatory list for the NSG and the inclusion of some amendments to this list.

Fifthly, the approval of mandatory requirements for physical protection of nuclear material and equipment.

⁴⁶David Fischer is not quite right when he argues that the USA insisted in the *London Club* on the principle of full-scope safeguards (Fischer David. *The London Club and the Zangger Committee*. Op.cit., pp.40, 41). In fact, the US silently backed Soviet-British proposal (or, rather, did not make any objection to it), but was not active in discussions of this issue. The USA took active position on the matter only under the Carter Administration and after the adoption of the 1978 Nonproliferation Act.

At first, the group passed the initial version of the Guidelines for Nuclear Transfers, which did not include physical protection measures. Taking into account the urgent nature of the issue, the parties decided to confirm officially what they had agreed upon. And in late January 1976, the seven suppliers exchanged confirmations that they would act in accordance with the approved Guidelines.

The Soviet government approved the Guidelines on December 11, 1975. Informing Washington of the Soviet decision, the Soviet Embassy in the USA pointed out in a memorandum on January 27, 1976 that the Soviet government reserved the right to refrain from using the Guidelines, but would notify the US government before taking such steps. The note also stated that while the Soviet government did not intend to publish such notification, it kept the right to give a public explanation that its attitude towards the export of nuclear material, equipment, and technology would be based on principles corresponding with the Guidelines⁴⁷. Similar provisions were contained in the notes of other suppliers. The US Embassy in Moscow stressed to the Soviet MFA that Washington regarded the Guidelines as minimal norms.

It is noteworthy that the press learned about the agreement so quickly. On January 30, the *International Herald Tribune* informed the readers that the suppliers group had approved a common policy concerning nuclear export.

The US administration submitted a detailed report to the Senate on February 24, 1976. At the meeting of the Senate Sub-Committee on Arms Control, International Organizations and Security Agreements, George Vest informed the Senators that, together with other nuclear suppliers, the USA had achieved a significant breakthrough in approving a common set of norms concerning safeguards and other control measures related to peaceful nuclear export. Vest emphasized that since he was speaking in public, he was unable to discuss the policies and positions of other countries and explained that some of the participants considered the on-going consultations as sensitive and therefore honored their confidentiality and privacy. However, afterwards Vest discussed before the Senate Sub-Committee all major provisions of the Guidelines adopted in January 1976. His statement before the Senate was disseminated among members of the *Zangger* Committee in late January -- early February 1977⁴⁸.

Another part of the Guidelines -- criteria for levels of physical protection -- was adopted at the meeting of the expert group convened in London on March 31,

⁴⁷Archives of the Russian Foreign Policy. F.47, op.22, p.200, d.54, ll.20-33.

⁴⁸Ibid., op.23, p.214, d.75, ll.11-13.

1976. This meeting produced the document «Criteria for Levels of Physical Protection» based on the 1975 IAEA recommendations (INFCIRC/225). The NSG later approved the document as an integral part of the Guidelines at the meeting of the *London Club* in early June 1976.

In 1976-1977, eight more states joined the NSG -- Belgium, East Germany, Italy, the Netherlands, Poland, Czechoslovakia, Switzerland and Sweden. This expansion of the NSG faced some difficulties due to French resistance. For instance, the June 1976 meeting was attended by 12 suppliers (seven original members plus East Germany, Italy, the Netherlands, Sweden and Belgium). This session succeeded to admit two new members -- Poland and Switzerland. Soon Czechoslovakia also joined the group. All 15 members attended the NSG meeting for the first time on April 28-29, 1977.

On the eve of this session, the Swiss government on April 20, 1977 declared its decision to join the *London Club* and made a statement to the press regarding the Swiss policy on nuclear exports, which corresponded with major provisions of the Guidelines. Thus, Prof. Zangger's dream came true, since, according to his compatriot Alec Baer, Prof. Zangger «complained bitterly (but diplomatically) about not having been invited to the NSG discussions»⁴⁹.

In the course of further NSG activities, all new attempts to tighten export controls failed.

The final version of the Guidelines for Nuclear Transfers was adopted at the last session of the *London Club* on September 20-21, 1977, which then decided to make them public. These guidelines were attached to the letters of the 15 suppliers to the Director General of the IAEA on January 11, 1978. The letters contained assurances that the governments would act in compliance with the Guidelines. The letters and the Guidelines were published as INFCIRC/254 in February 1978 (Appendix 1).

⁴⁹Baer Alec. Op.cit., p.7.

CHAPTER VI. DELIBERATION OF EXPORT CONTROLS AT THE FIRST NPT REVIEW CONFERENCE

The First NPT Review Conference was held in Geneva in May 1975. Among other issues, the participants discussed the problem of implementing Article III (2).

The head of the Soviet delegation Igor Morokhov in his statement at the plenary session of May 6 declared that the Soviet Union was involved in the arrangements of the *Zangger* Committee and called for increasing the number of its members to cover all major suppliers of nuclear material and equipment.

Without giving the details of the negotiations within the NSG on tightening export controls, he emphasized:

«One cannot disregard that it is possible to use, in specific circumstances, for the construction of a nuclear explosive device nuclear equipment and materials intended for peaceful purposes. States Parties to the treaty have taken appropriate commitments under the treaty. As for the non-parties to the NPT, it represents the necessity for all participants of the treaty supplying nuclear equipment and materials or offering any kind of assistance in the peaceful use of nuclear energy to such states to demand from their recipients pledges of non-use of received materials for the development of **any** [emphasis added -- **Auth.**] nuclear explosive device [...] Such conditions would appear to be effective means of further tightening the system of nonproliferation of nuclear weapons.

We infer from this, that, in accordance with the nature of the agreement, non-nuclear weapon states participating in the treaty have committed not to offer other non-nuclear weapon states any sort of assistance in the development of nuclear weapons or other nuclear explosive devices».

One should recall that Article I of the NPT contains a commitment for the nuclear weapon states not to assist non-nuclear weapon states in the development of nuclear weapons or other nuclear explosive devices, but has no similar direct commitment for non-nuclear weapon states party to the NPT. However, the spirit of the treaty clearly implies that this commitment covers all parties to the NPT, including non-nuclear weapon states.

As far as the supply of nuclear material and equipment to non-parties are concerned, Article III (2) requiring safeguards for such equipment and material does not explicitly exclude the use of material imported for the manufacturing

of nuclear explosive devices. This is why Memorandum A of the *Zangger* Committee provides for the application of safeguards in non-parties to the NPT to prevent the diversion of nuclear material from peaceful uses to nuclear weapons or other nuclear explosive devices. The *London Club* also envisaged such commitment on the part of nuclear suppliers.

In his speech, Morokhov raised the issue of the physical protection of nuclear material, which was not specifically touched upon by the NPT. He maintained that «expanded circulation of such materials within the countries and between the states has significantly increased the danger of their use in provocative, terrorist or other vicious purposes». In this connection, «it is necessary to take international measures to enhance responsibility of the states for physical protection of nuclear material. Such measures can be based on the IAEA recommendations on physical protection. We suggest that the issue of adopting such recommendations be discussed».

In the course of the conference, supporters of tight export controls, including the USSR, succeeded in passing strict and binding wording concerning Article III (2). The Final Declaration of the Conference adopted by consensus on May 30 stressed:

«With regard to the implementation of Article III.2 of the Treaty the Conference notes that a number of states supplying nuclear material or equipment have adopted certain minimum standards required for IAEA safeguards in connection with their export of certain such items to non-nuclear-weapon states, which are not parties to the Treaty (IAEA document INFCIRC/209 and Addenda). The Conference attaches particular importance to the condition of assuring the non-diversion of nuclear weapons or other nuclear explosive devices, as included in the said requirements by those states».

The conference did not limit itself to supporting the *Zangger* arrangements. The Final Declaration also stated that the Conference «urges that:

«a) in all possible ways, common export requirements relating to safeguards be strengthened, in particular by extending the application of safeguards to all peaceful nuclear activities in importing states parties to the Treaty;

«b) such common requirements be accorded the widest possible measure of acceptance among all suppliers and recipients;

«c) all parties to the Treaty should actively pursue their efforts to these ends».

This statement should be regarded as instructions to the NSG to continue efforts to develop additional requirements for nuclear export controls. As for two other proposals concerning nuclear export controls, the conference failed to come to a compromise and only took note of them. According to the Final Declaration, the proposals were as follows:

- «it was the view of many Parties to the Treaty that the safeguards required under Article III.2 should extend to **all** [emphasis added -- **Auth.**] peaceful nuclear activities in importing states»; and
- «the suggestion that it is desirable to arrange for common safeguards requirements in respect to nuclear material processed, used, or produced by the use of the scientific and technical information transferred in tangible form to non-nuclear states not party to the treaty».

The conference also urged all states engaged in peaceful nuclear activities to conclude international agreements that could ensure the physical protection of nuclear material⁵⁰. This decision made by the conference gave impetus to the NSG to work out physical protection arrangements. It was also a good impulse to commence, in 1977, the negotiation of the Convention on the Physical Protection of Nuclear Material, which was approved in 1980 and entered into force in 1987.

At the final session of the conference, the Soviet delegation commended the adopted decisions relating to Article III (2) and the physical protection of nuclear material⁵¹.

On the whole, the First NPT Review Conference deliberated the problems of tightening nuclear export controls without any significant debate. This lack of contention boosted further activities of the NSG. Such constructive discussion was accounted for by the fact that the non-aligned states were not yet informed about the specific steps planned by the *London Club*. However, later, when the London Guidelines became public, the Non-Aligned Movement (NAM) strongly criticized the decisions of the nuclear suppliers.

For instance, in the Declaration of the NAM Ministerial Conference in Belgrade on July 30, 1978, the participants maintained:

⁵⁰Ibid., pp.105, 106.

The first proposal spoke about compulsory character of full-scope safeguards for nuclear export to non-parties to the NPT. At that time, there was no consensus among suppliers. The NSG approved this principle only in 1992. As far as the second motion was concerned, it implied control over technology transfers, which was not required by Article III (2). There was no agreement on this issue either. And the NSG managed to obtain only partial agreement concerning control over technology transfers, which covered only the most sensitive technologies.

⁵¹Ibid., pp.99, 100.

«152. Noting the significance of nuclear energy for the acceleration of economic growth of the non-aligned states, the Ministers express their concern in connection with the unacceptable monopolistic policy of the nuclear weapon states and demand the creation of conditions for unimpeded exchange of nuclear technology. At the same time they emphasize the necessity of observing the principles of free access to nuclear technology and non-discrimination, as well as the right of every country to develop a program for the peaceful uses of nuclear energy according to its economic and social development demands»⁵².

The *London Club's* decisions were strongly condemned by recipients at the Second NPT Review Conference in 1980. Along with criticizing nuclear weapon states for the unsatisfactory implementation of Article VI of the NPT (relating to disarmament), NAM states provoked a heated debate on export controls. Many of them accused exporters of establishing a *neo-colonial cartel* and of breaching Article IV (concerning peaceful uses of nuclear energy). They demanded to fulfil all existing contracts, criticized unilateral terms of supplies and regarded as unacceptable any threats to stop the supplies. Switzerland also made some objections, since the USA refused to give its consent for reprocessing irradiated fuel of US origin. At this conference, the parties failed to adopt the Final Document due to serious differences (focused, above all, on Article VI of the NPT relating to nuclear disarmament).

⁵²Collection of major documents on disarmament. Vol. XX. 1978, p.292.

CHAPTER VII. THE FRENCH POSITION

The very process of French involvement in the *London Club's* activities was quite complicated and therefore needs to be described in some detail. As referred to earlier, in the course of preliminary consultations, at the presidential level, the USA raised the issue of the French participation in the NSG and Valéry Giscard d'Estaing eventually solved this problem (although, probably, with some hesitation). French officials (the French delegation to the NSG was headed by Xavier de Nazelle of the MFA and a significant and positive role was played by Bertrand Goldschmidt of the CEA who was on the delegation) attended the meetings of nuclear suppliers and in the beginning were quite passive, mostly listening to exchanges of opinions of other participants. They preferred bilateral and confidential contacts with other suppliers and the Soviet delegation several times met the French delegation in London on a bilateral basis. Gradually, the two delegations established relations of mutual trust. In the spring of 1977, the French officials came to Moscow and we met them in the Department of International Organizations of the Soviet MFA. In autumn 1977, the Soviet representatives went to Paris for bilateral consultations with their French counterparts. Obviously, these contacts contributed to the evolution of the French position in favor of adopting concerted measures on nuclear export controls.

The turning point in French policy was the decisions made by the High Council on Foreign Nuclear Policy of France established by the President of the Republic. These decisions were made in October and December 1976, i.e. 12-18 months after the commencement of the NSG. The Council Communique of October 11 stated that:

«2. France intends to pursue its policy exporting nuclear materials in compliance with its international commitments in this area.

«3. France will not promote the proliferation of nuclear weapons in its policy of nuclear export. It will enhance appropriate provisions and safeguards existing in the area of nuclear equipment, material, and technology».

Thus, the French leadership for the first time supported in public the application of safeguards on exporting as provided for in the NPT, i.e. the IAEA safeguards. France avoided signing the treaty in 1968, but made the general statement that it «will act in the future as other states party to the treaty»⁵³. In 1976, the statement was more specific and concerned its

⁵³Collection of major documents on disarmament, Vol. X. 1968, p.387.

commitment to observe the provisions of Article III (2). The Communique further stated:

«5. The French Government believes that all suppliers of nuclear equipment, material, and technology shall not promote the proliferation of nuclear weapons by means of commercial competition.

«6. France is ready to hold negotiations on these issues with supplier nations, on one hand, and with non-supplier nations engaged in the implementation of substantial programs constructing nuclear power plants, on the other»⁵⁴.

The statement implied that France would coordinate with other suppliers regarding common international rules regulating the export of nuclear material, equipment, and technology.

Two months later, the French government went even further and made another stride forward. The High Council in its Communique of December 16 declared:

«The French Government decided until further notice to prohibit the conclusion of bilateral contracts on supplying a third state with industrial plants for reprocessing irradiated fuel»⁵⁵.

Although the decision did not rule out the possibility of supplying experimental facilities, France went beyond the NSG rules adopted in 1977, since the NSG regulations provided only for *restraint* in supplying such sensitive equipment as plants for reprocessing irradiated fuel. After making this decision, France refused to supply Pakistan with equipment for a plutonium separation plant.

During Leonid Brezhnev's visit to France in June 1977, the parties signed the joint declaration on the nonproliferation of nuclear weapons, a document which Russian and French officials had prepared in Moscow on the eve of the visit. It stated that:

«They will look after each instance of their cooperation with third countries in the area of nuclear industry to grant every guarantee, in order not to allow the proliferation of nuclear weapons. Therefore, they remind that they spoke against the limitation of the exchange of nuclear materials suitable for the development of nuclear weapons or other nuclear explosive devices, as well as equipment and technology which may develop those materials.

⁵⁴*Le Monde*, 13 Octobre 1976. See: Collection of major documents on disarmament, Vol. XVIII. 1976, pp.509, 510.

⁵⁵*Le Monde*, 18 Decembre 1976. See: Ibid., p.707.

«Both parties will conduct a policy of exporting nuclear materials, equipment, and technology keeping in mind their international commitments in this area.

«They are ready to strengthen appropriate safeguards and provisions existing in the area of nuclear equipment, materials, and technology. They further will actively contribute to the agreement of the general principles concerning nuclear exports».

And indeed, the French delegation began to actively participate in the work of the London Club in the final stage of its activities elaborating common export control rules.

Finally, the declaration stated that the parties «attached special significance to the physical protection of nuclear materials from any unauthorized use or application. They publicly called for the elaboration of an international convention on that issue»⁵⁶.

According to Bertrand Goldschmidt, who also represented France for many years in the IAEA Board of Governors, the first and the most important result of such talks was France's confirmation of its commitment to the spirit and letter of the NPT. France abandoned its trump card -- freedom of defining political terms of nuclear supplies -- and agreed to apply the IAEA safeguards to all supplies of material, equipment and technology in accordance with the trigger list jointly approved by the NSG members. By giving its consent to participate in the NSG, the French government left Germany, Italy and Japan without last pretext for non-ratification of the NPT, which was the privileged position of the French industry at the international market⁵⁷.

At the same time, Goldschmidt admits that France used «silent support» of Germany, Italy and Japan to object the adoption of the principle of full-scope safeguards as a condition of supplies⁵⁸.

⁵⁶*Pravda*, 23 June 1977. See: Collection of major documents on disarmament. Vol. XIX, 1977, pp.1091, 1092.

⁵⁷Goldschmidt Bertrand. *Op.cit.*, p.420. Although French willingness to participate in the NSG had a positive impact on the decision of aforementioned states to join the NPT, Goldschmidt somewhat exaggerates the importance of this fact. West Germany and Italy deposited their instruments of ratification on May 2, 1975, after the first NSG meeting, when there was much time left before the adoption of the London Guidelines. Their decision to ratify the treaty may be explained rather by their desire to participate in the First NPT Review Conference as full-fledged parties to the treaty. Japan acceded to the NPT only on June 8, 1976 (it signed the treaty on February 3, 1970) and the delayed ratification was caused chiefly by other reasons of internal and external character.

⁵⁸*Ibid.*, p.421.

CHAPTER VIII. GUIDELINES FOR NUCLEAR TRANSFERS

The Guidelines for Nuclear Transfers, as we have already mentioned above, were adopted at the last session of the *London Club* in September 1977 and issued by the IAEA as INFCIRC/254 in February 1978 (See Appendix I). The 1977 Guidelines stated that they «should apply to nuclear transfers to any non-nuclear weapon state for peaceful purposes».

Let's consider the major provisions of the Guidelines. As a principal condition of nuclear supplies, the document states (paragraph 2) that «suppliers should authorize transfer of items identified in the trigger list only upon formal governmental assurances from recipients explicitly excluding uses which would result in any nuclear explosive device».

Although this provision, in fact, corresponds with fundamental commitments under the NPT, its inclusion in the Guidelines is important, since it obliges any exporter to observe this principle, whether or not party to the treaty, e.g. France, which, at that time, did not participate in the NPT. It is also significant because such assurances shall be obtained from any non-nuclear weapon states, including those non-parties to the treaty.

Paragraph 3 states that all nuclear materials and facilities identified by the agreed upon Trigger List «should be placed under effective physical protection to prevent unauthorized use and handling». At the same time, the parties agreed upon levels of physical protection in relation to the type of materials, taking account of international recommendations (sub-paragraph «a»). The document also maintains that «the implementation of measures of physical protection in the recipient country is the responsibility of the Government of that country». However, to implement this condition, «the levels of physical protection on which these measures have to be based should be the subject of an agreement between the supplier and the recipient» (sub-paragraph «b»).

The international recommendations were the IAEA recommendations agreed upon by experts from 11 states in 1971-1972 and published in 1972. In 1975, the Agency revised the recommendations, taking into account the recent achievements in the area of the physical protection of existing types of nuclear plants. As a result, the IAEA issued a new document «The Physical Protection of Nuclear Material» (INFCIRC/225). This document, which defined the components of a national system of physical protection, provided for a clear classification of nuclear material depending on their type and amount and gave recommendations on the levels of required physical protection for transportation of nuclear material. Later, in 1977, the document was reviewed

again and amended. The amendments concerned mostly the classification of nuclear material and specific objectives of the document (INFCIRC/225/Rev.1). The Guidelines for Nuclear Transfers made these recommendations legally binding for the first time. In 1980, the international Convention on the Physical Protection of Nuclear Material was adopted.

Another substantive condition of nuclear export is a requirement to «transfer trigger list items only when covered by IAEA safeguards, with duration and coverage provisions in conformance with the GOV/1621 guidelines» (paragraph 4). At the same time, «exception should be made only after consultation» with the parties that created the London Guidelines.

The decision of the Board of Governors, approved in February 1974 and set forth in the aforementioned document -- GOV/1651 of August 21, 1973, stipulated that in order to achieve uniformity in the duration and conditions for the cessation of safeguards, the parties should observe the following principles:

«a) the term of the agreement should correspond to the period of actual use of the materials or equipment in the recipient state; and

«b) the status of the termination of the agreement should be formulated in such a way that the parties continue to preserve the rights and responsibilities pertaining to the supplied nuclear material and special fissionable material, produced, processed, or used in the supplied nuclear material, equipment, plants, or non-nuclear material before the Agency terminates the application of the safeguards to that material»⁵⁹.

This important provision of the Guidelines means that whatever actions the recipient takes (e.g. withdrawal from the NPT or from the safeguards agreement applicable to supplied material and equipment), it will be illegal to stop applying the safeguards without the Agency's consent.

Paragraph 5 stipulates that suppliers can only jointly reconsider their common safeguards requirements, whenever appropriate. This provision was included in the Guidelines because some suppliers proposed to incorporate additional requirements in the Guidelines. For instance, the USSR and the UK suggested that suppliers should provide for the application of full-scope safeguards in all states receiving nuclear material, equipment, and technology named in the

⁵⁹ According to the Soviet Mission in Vienna (its letter to MFA of September 15, 1974), this decision of the Board, was adopted with certain resistance on the part of France, which believed that duration of safeguards application procedure to any bilateral agreement relating to international supplies of nuclear material or equipment should be defined in each case by parties to such agreement. (Archives of the Russian Foreign Policy. F.47, op.20, p.179, d.56, l.143).

Trigger List. However, at that time this initiative was not backed by other parties. They decided then that reconsideration of requirements should occur only by consensus.

Paragraphs 6-8 regulate the principles of control over the export of sensitive technology and equipment, which were a breakthrough in comparison to the NPT, since the treaty did not regulate nuclear technology transfers. Nevertheless, Article I, stipulates the responsibility of not assisting, not encouraging, and not providing incentives for the production of nuclear weapons or other nuclear explosive devices to any state, nor possessing nuclear arms. Not giving corresponding technology in any such case was implied.

However, the NSG was not satisfied with that NPT provision and decided that international agreement should include the commitment to not transfer sensitive technologies or, at least, to show maximal restraint for that purpose. This amendment was needed because of the international practice at that time, of transferring to other states technology that might have resulted in a nuclear explosive device.

The Soviet delegation at the *London Club* meetings insisted on an agreement concerning the non-supply of spent fuel reprocessing plants and uranium enrichment plants. However, that initiative failed, as well as another Soviet proposal to introduce a moratorium for such transfers.

According to paragraph 6-a, «the requirements of paragraphs 2, 3 and 4 should apply to facilities for reprocessing, enrichment or heavy-water production, utilizing technology directly transferred by the supplier or derived from transferred facilities, or major critical components thereof». Such requirements include a prohibition on nuclear explosives, assurances of physical protection, and the application of safeguards.

Paragraph 6-b specifies the procedure for applying IAEA safeguards to the aforementioned transfers of sensitive technologies, «The transfer of such facilities, or major critical components thereof, or related technology, should require an undertaking (1) that IAEA safeguards apply to any facilities of the same type (i.e. if the design, construction or operating processes are based on the same or similar physical or chemical processes, as defined in the trigger list) constructed during an agreed period in the recipient country [i.e. duration depends on the suppliers requirements -- **Auth.**] and (2) that there should **at all times** [emphasis added -- **Auth.**] be in effect a safeguards agreement permitting the IAEA to apply Agency safeguards with respect to such facilities...»

Paragraph 7 was agreed upon by the parties after long discussion. Some members of the NSG proposed to set strict control standards for the plants most sensitive from the point of nuclear nonproliferation. Some of them even suggested that such supplies to non-nuclear weapon states should be banned. There was no consensus and the document states only that «suppliers should exercise restraint in the transfer of sensitive facilities, technology and weapons-usable materials». At the same time, «if enrichment or reprocessing facilities, equipment or technology are to be transferred, suppliers should encourage recipients to accept, as an alternative to national plants, supplier involvement and/or other appropriate multinational participation in resulting facilities». An example of such a multinational facility for centrifugal uranium enrichment is the Anglo-German-Dutch plant in Almelo (the Netherlands).

Commenting on the aforementioned provision of the Guidelines, Alexander Rogov, a Soviet nonproliferation expert, wrote: «Is it possible to transfer recklessly sensitive technology to a state if it is not required by its nuclear program and the actual state of its nuclear energy sector? Is it worth meeting halfway some states striving to acquire sensitive technology for individual use, if we know that this will inevitably cause concern and apprehension for other states and that there are other opportunities for sensibly satisfying existing demand on collective, multinational basis? Obviously, the answers to such questions will be only *no*»⁶⁰.

Besides, in accordance with paragraph 7, suppliers are committed to «promote international (including IAEA) activities concerned with multinational regional fuel cycle centers». This idea was reflected in the IAEA Statute (Article XII (A-5), but so far was not developed.

Paragraph 8 maintains that «for the transfer of an enrichment facility, or technology thereof, the recipient nation should agree that neither the transferred facility, nor any facility based on such technology will be designed or operated for the production of greater than 20% enriched uranium without the consent of the supplier nation, of which the IAEA should be advised».

The commitment to exercise restraint was fully observed in practice by suppliers. After approving the Guidelines, they even *de facto* imposed an embargo. This is only partially true as far as private companies were concerned, since they often violated national legislation⁶¹.

⁶⁰Rogov A.N. Op.cit., p.61.

⁶¹For instance, Swiss company Sulzer Brothers built in Argentina a heavy-water production facility with capacity of 250 tons a year.

Paragraph 9 recognizes «the importance of including in agreements on the supply of nuclear materials or facilities which produce weapons-usable material, provisions calling for mutual agreement between the supplier and the recipient on arrangements for reprocessing, storage, alteration, use, transfer, or retransfer of any weapons-usable material involved. Suppliers should endeavor to include such provisions whenever appropriate and practicable».

The importance of this agreement on reprocessing, storage, alteration, use, etc. of nuclear material is a result of the fact that the recipient may obtain another material dangerous from the point of view of the proliferation of nuclear explosive devices. This requirement is not absolute and is more of a recommendation. In practice, it may provide for a supplier's demand to return spent fuel in order to rule out the possibility of plutonium separation by a recipient nation. The USSR always demanded the inclusion of a provision concerning the return of spent fuel in the agreements on the supply of reactors and fuel.

Paragraph 10 regulates controls on retransfer. According to its provisions, suppliers should transfer Trigger List items, including sensitive technology, «only upon the recipient's assurance that in the case of (1) retransfer of such items, or (2) transfer of trigger list items derives from facilities originally transferred by the supplier, or with the help of equipment or technology originally transferred by the supplier; the recipient of the retransfer or transfer will have provided the same assurances as those required by the supplier for the original transfer».

In addition, the supplier's consent should be required for: (1) any retransfer of the facilities, major critical components, or sensitive technology; (2) any transfer of facilities or major critical components derived from those items; and (3) any retransfer of heavy water or weapons-usable material.

The need for clearly stated conditions of retransfer and transfer was obvious. Without such conditions, nuclear material, technology and equipment might have been acquired by states other than the original recipients, which had received the consent of the supplier. In global commercial practice, conditions of retransfer are often negotiated with respect to items less dangerous than nuclear-exported goods. Therefore, it is fair and necessary to apply such restrictions on the supply of material and equipment that can be used to develop weapons of mass destruction.

Along with the Guidelines approved by the NSG, the document contains a section on supporting activities, which outlines the intentions of suppliers:

- «to promote international cooperation of the exchange of physical security information, the protection of nuclear materials in transit, and the recovery of stolen nuclear materials and equipment» (paragraph 11);
- to support «effective implementation of IAEA safeguards» (paragraph 12);
- to encourage «the designers and makers of sensitive equipment to construct it in such a way as to facilitate the application of safeguards» (paragraph 13).

After a long debate, the suppliers failed to approve the provision concerning the application of sanctions against violators of the export control regime. Soviet representatives insisted on elaborating sanctions procedures, but did not propose any specific measures, however, they were prepared to consider the proposals of other delegations.

Finally, suppliers agreed (paragraph 14) that they would consult, as each deemed appropriate, «to ensure that any transfer does not contribute to risks of conflict or instability». They did not go beyond the provisions of sub-paragraph «c»:

«In the event that one or more suppliers believe that there has been a violation of the supplier/recipient understanding laid out in these guidelines, particularly in the case of an explosion of a nuclear device, illegal termination, or violation of IAEA safeguards by a recipient, suppliers should consult promptly through diplomatic channels in order to determine and assess the reality and extent of the alleged violation [...].

«Upon the findings of such consultations, the suppliers, bearing in mind Article XII of the IAEA Statute, should agree on an appropriate response and possible action which could include the termination of nuclear transfers to that recipient».

This mechanism of consultations, however, has not been used for many years, except for sporadic contacts between certain suppliers, mainly on a bilateral level.

The consultations between the USSR and the USA on nuclear nonproliferation held in the 1980s and later were of more regular character and considered practical issues of control over nuclear export.

Finally, in paragraph 16 the suppliers agreed to make any changes in the Guidelines only by unanimous consent.

Annex A to the London Guidelines contains the Trigger List referred to in Guidelines and a Clarification of items on the Trigger List. This list had been previously approved by the *Zangger* Committee and was expanded by the *London Club* by including in it some items related to heavy water production and by specifying provisions concerning zirconium tubes and «equipment, other than analytical instruments, especially designed or prepared for the separation of isotopes of uranium». Annex B comprises criteria for levels of physical protection.

After the inception of the Guidelines, all work to improve the Trigger List and to amend it has been carried out by the *Zangger* Committee, which convenes its meetings twice a year in Vienna (normally in May and in October).

CHAPTER IX. AVOIDING DUPLICATION IN THE COURSE OF GUIDELINES IMPLEMENTATION

The last NSG meeting in London on September 20-21, 1977 decided to organize an *ad hoc* working group to identify the problems of duplicating safeguards, studying the ways to solve this problem and to submit report on the results of this work to the NSG at the earliest possible date, namely:

- a) identification of the problems of duplicating guarantees, other rights, and responsibilities arising from the agreements between the suppliers and the recipients;
- b) the study of ways and means for solving these problems;
- c) the presentation of the results of the research done to the NSG as soon as possible⁶².

The meeting of the working group was held in Stockholm (Sweden) on February 23-24, 1978. Along with all 15 members of the NSG, the meeting was attended by Australia as an observer. The USSR was represented by Michael Ryzhov (Minsredmash) and Sergei Kislyak (MFA).

Japan, which had put forward the initiative of establishing such a group, disseminated a working paper aimed at solving within the group some problems that had emerged between Tokyo as an importer and its supplier during the implementation of its bilateral agreements. Japan emphasized significant difficulties in obtaining US permission for reprocessing irradiated fuel. France also demanded expediting the system of obtaining such permissions from many states. The French proposed to explore the possibility of delegating the right of preliminary consent by one supplier (or suppliers) to another (or others).

Canada refused to abandon its right for preliminary permission in favor of any other state. It suggested that they should establish a new international mechanism to simplify the procedure of using the right of preliminary consent for such transactions as enrichment, spent fuel reprocessing and re-transfer under bilateral agreements and facilitating accounting of inventory quantities of material subject to such agreements.

There was an impression that Canada, with the silent approval of the USA, attempted to establish a special regime for the monitoring and control of its nuclear supplies, including (as one of components) Ottawa's capability to

⁶²Archives of the Russian Foreign Policy. F.47, op.24, p.226, d.72, ll.29, 30.

implement bilateral control (and even to send its inspectors to importing nations)⁶³.

The Soviet delegation believed that such a proposal might undermine the IAEA international safeguards system and would result in the establishment of a regime in which Canada, the USA and Australia would dominate. Bearing in mind that this would also weaken the IAEA authority, the Soviet Union rejected the Canadian initiative. The USSR proposed to reflect in the final document of the meeting that requirements provided for in the Guidelines for Nuclear Transfers had caused no problem with their implementation.

Great Britain pursued a *wait-and-see* policy, but pointed out that the majority of the problems originated from difficulties with implementing bilateral agreements and not from duplicating the requirements of the Guidelines. Under these circumstances, Canada had to recall its initiative as premature⁶⁴. The working group agreed to convene its next session from May 31 to June 1, 1978 in Stockholm.

At the second meeting of the working group, the Soviet delegation continued to object to the establishment of new supervisory bodies, regarding such initiatives as undermining the authority of the IAEA. The USSR and some other suppliers also opposed the transfer to other states the right for preliminary consent for chemical reprocessing and thus opposed the inclusion of such a provision in the Guidelines. The meeting achieved no tangible results.

Canada, nevertheless, continued to make attempts to promote its idea of establishing a system of monitoring exported nuclear material in its movement along the technical chain to other countries.

In May-June 1978, the Canadian Embassy in Moscow addressed the Soviet MFA with a request to provide detailed information on two consignments of UF₆ received by the USSR for enrichment and to be transferred to West Germany. These consignments, however, were not supplied to the USSR by Canada itself, but by German companies for enrichment and the subsequent return to West Germany of enriched uranium and waste.

The USSR had no international obligation to provide Canada with the information it sought concerning the state and origin of the uranium. According to the July 1974 agreement (INFCIRC/207), the Soviet Union submitted to the IAEA all information on uranium enriched at the Soviet enterprises for other

⁶³Such monitoring procedure was incorporated in the Canadian legislation.

⁶⁴Archives of the Russian Foreign Policy. F.47, op.24, p.226, d.72, ll.48-51.

states, in order to implement safeguards with respect to such material in recipient nations.

Canada's request to obtain information was seen by Moscow as an attempt to introduce special accounting for nuclear material in the states where such materials could be. It was obvious that the next step would have been Canadian inspections to verify the inventory of such material. Any unilateral control on the part of Canada was regarded by Moscow as unacceptable.

Along these lines, on July 20, 1978 the MFA sent a note to the Canadian Embassy and informed it that, in accordance with its international commitments of July 1974, the Soviet Union would notify in due time the IAEA about the enrichment, at the Soviet plants, of the aforementioned uranium consignments. The USSR was not prepared to go beyond its international commitments. At the same time, one should realize that there were difficulties with defining the origin of the material purchased by German firms and transferred to the USSR for enrichment⁶⁵.

⁶⁵Archives of the Russian Foreign Policy. F.47, op.24, p.226, d.72, ll.153, 155, 164-167.

CHAPTER X. PRINCIPLE OF FULL-SCOPE SAFEGUARDS

In the course of the *London Club* meetings, the USSR and Great Britain put forward an initiative to include in the Guidelines the principle of requiring that recipients apply full-scope safeguards as a condition of receiving nuclear material, equipment, and technology. However, this proposal failed to pass due to objections by France, West Germany, Japan and Switzerland.

The Soviet and British delegations indicated that they would comply with this provision only if all other key suppliers supported the principle of full-scope safeguards. Since their joint initiative was not backed by the NSG, the Soviet Union addressed the Director General of the Agency with the declaration of January 11, 1978:

«The Government of the Union of Soviet Socialist Republics emphasizes its determination to continue its efforts to secure agreement between countries supplying nuclear materials, equipment and technology on the principle that IAEA safeguards must be applied to all nuclear activities of non-nuclear weapon states when those states receive any of the items mentioned in the initial list referred to in the above-mentioned Note Verbale. In this connection, the Government of the USSR takes the view that the principle of catch-all control is a necessary condition for ensuring effective safeguards which can prevent nuclear material, equipment and technology from being used for manufacturing nuclear weapons or other nuclear explosive devices»⁶⁶.

Other states made no such statements. The Soviet-British proposal was backed by some suppliers, who unilaterally committed themselves to full-scope safeguards. These were Canada in 1976, Australia and Sweden in 1977, and the USA, Poland, and Czechoslovakia in 1978. For a while this process was delayed and the next states to approve full-scope safeguards were Japan (1989) and Germany (1990).

Later on, the issue of full-scope safeguards was widely discussed at the Fourth NPT Review Conference held in Geneva in August-September 1990. The Main Committee II of the conference, which was in charge of Articles III, IV and VII (safeguards, peaceful uses and nuclear-weapon-free zones respectively) and was chaired by Amb. Tadeusz Strulak (Poland), adopted the following document:

«20. The conference urgently calls on all non-nuclear weapon states, which still have not done so, to accept the international legally binding commitment not to

⁶⁶INFCIRC/254, Letter XII.

acquire nuclear weapons or other nuclear explosive devices and to accept the IAEA safeguards in relation to all their peaceful nuclear activities, at present and in the future, in confirmation of that obligation. The conference further calls for all nuclear supplier states, henceforth, to require from the non-nuclear weapon states the acceptance of this obligation and these safeguards, as a necessary condition for transfers, in accordance with the new agreements concerning supplies of corresponding nuclear resources».

The delegations of Belgium, Italy, the United Kingdom, the USSR, and Switzerland made a reservation concerning the usage of the word «to require» and proposed to amend it to: «jointly require»⁶⁷.

The Soviet delegation would endorse the principle of full-scope safeguards only if it were supported by all key nuclear suppliers⁶⁸. In its statement on this issue before the Main Committee II, a Soviet official emphasized that it was correct to insist on full-scope safeguards applied to all nuclear activities of the non-nuclear weapon states and called on other suppliers to support this trend⁶⁹.

Presumably, the British delegation and the delegations of some other states, which made the above reservation, had similar instructions. The report of the Main Committee II, however, was not approved by the conference, since its decisions were to be adopted by a consensus. Such a consensus was impossible due to fundamental differences among participants on the implementation of Article VI of the NPT (disarmament), thus the Final Document was not adopted.

The principle of full-scope safeguards for nuclear export to non-nuclear weapon states was approved by the NSG in 1992 only. The Russian Federation committed itself to this principle on March 27, 1992 (in accordance with President Yeltsin's decree)⁷⁰.

This principle was also reflected in the decisions of the 1995 NPT Review and Extension Conference adopted by consensus:

«12. New supply arrangements for the transfer of source or special fissionable material or equipment or material especially designed or prepared for the

⁶⁷NPT/CONF.IV/MC.II/1, p.10.

⁶⁸The author was Acting Head of the Soviet delegation at the conference.

⁶⁹From personal archives of the author.

⁷⁰*Rossiiskaya Gazeta*, 3 April 1992. On May 6, 2000, President Putin adopted the decree on amendments to the 1992 document. According to the new decree, in exceptional cases, nuclear export from Russia to non-nuclear weapon states that have not placed all their nuclear activities under the IAEA safeguards can take place in compliance with individual decisions of the Russian Government for the sole purpose of ensuring safe operation of existing nuclear power plants. This provision is in full compliance with the Guidelines for Nuclear Transfers.

processing, use or production of special fissionable material to non-nuclear-weapon States should require, as a necessary precondition, acceptance of IAEA full-scope safeguards and internationally legally binding commitments not to acquire nuclear weapons or other nuclear explosive devices»⁷¹.

The 2000 NPT Conference in its Final Document also reaffirmed the principle of full-scope safeguards (by the reaffirmation of the aforementioned paragraph 12)⁷².

⁷¹NPT/CONF.1995/32 (Part I). Decision 2. Principles and Objectives for Nuclear Nonproliferation and Disarmament.

⁷²NPT/CONF.2000/28 (Vol. I, Part I and II). The Chinese delegation did not block the consensus, but declared that China would require safeguards only to supplied material and equipment.

CHAPTER XI. SOVIET PRACTICE AND LEGISLATION AFTER ADOPTING THE GUIDELINES FOR NUCLEAR TRANSFERS

Each member of the NSG is to implement the Guidelines in accordance with its national legislation and practice. Decisions on export applications are made at the level of each country in compliance with national export licensing requirements, which are the prerogative for any state. After approving the Guidelines for Nuclear Transfers, the majority of NSG members adopted national legislation regulating nuclear export.

In the USSR, authorities engaged in nuclear supplies began to observe the London Guidelines immediately after the Soviet government made an official statement in late January 1976 concerning the adoption of the initial version of the Guidelines. Soon thereafter, Moscow had to face some problems with its relationship with India.

In May 1976, Canada officially ceased the implementation of its agreement with India (and Pakistan) on nuclear cooperation. This forced India to take emergency measures to reorganize its nuclear industry. In 1977, New Delhi started the construction of a 100-MW reactor (*Dhruva*) which was to replace the aging and less powerful CIRUS (used for the production of plutonium for the 1974 nuclear test).

Some problems emerged concerning the operation of Indian civilian nuclear power plants and the completion of the construction of new ones. The 1972 Rajasthan-1 heavy-water power plant with a capacity over 200 MW was supplied by Canada, as was the case with CIRUS, and used heavy water from Canada, the USA, and the USSR (Canada and the USA supplied 130 tons, and the USSR 80 tons in 1973). India was in the process of finishing the construction of *Rajasthan-2* with a similar (200 MW) capacity, but to make it operate New Delhi required a large amount of heavy water. The nuclear power station in Rajasthan (RAPS-I and RAPS-II) was under IAEA safeguards and India addressed the Soviet Union with a request to supply the power plant with heavy water.

According to the Soviet decision of February 29, 1976, Moscow agreed to furnish 200 tons of heavy water but only in full compliance with all its international commitments, including the NPT and the Guidelines. The parties commenced long negotiations, which lasted several months.

In June 1976, the Soviet Ministry of Foreign Trade (VO *Techsnabexport*) signed an appropriate contract with India. However, the Indian government

refused to approve it, since it contained a provision concerning assurances of the non-use of heavy water for developing peaceful nuclear explosive devices.

The USSR did not conceal from other nuclear suppliers neither the very fact that it was negotiating with India nor the contents of the negotiations. During the IAEA General Conference in Rio de Janeiro in September 1976, delegations from the Soviet Union, the USA, and other nuclear suppliers continued consultations on issues discussed within the framework of the *London Club*. Igor Morokhov, Roland Timerbaev, and Resident Representative to the IAEA Vladimir Yerofeyev represented the USSR. In the course of these consultations, the parties discussed the peculiar situation regarding heavy-water supplies to India for RAPS-II.

Bearing in mind activities conducted by the *London Club* to approve the Guidelines and taking into account the aforementioned consultations, the Soviet delegation made the following statement, at the plenary session of the IAEA General Conference, in favor of strict export controls:

«A particular responsibility lies with the states exporting nuclear materials, equipment, and technology. Necessary firm safeguards must be accepted to ensure that international cooperation in the area of peaceful nuclear energy uses does not become a channel for the proliferation of nuclear weapons. Nuclear exports must not become a purely commercial operation. It...is not a commercial question, it is a question of big politics, a question of saving the world. As for the USSR, its nuclear export policy adheres to the strictest norms, thus excluding the possibility of the proliferation of nuclear weapons.

«The particular significance for strengthening of the nonproliferation regime includes the problem of applying IAEA safeguards to **all** [emphasis added -- **Auth.**] nuclear fuel cycle of non-nuclear weapon states non-parties to the NPT. It is also important that the states participating in the treaty do not supply equipment and nuclear materials to states that have not signed the agreement, without their assurances of non-use of those materials for the development of nuclear explosive devices»⁷³.

The Indian government badly needed heavy-water supplies and finally agreed with the Soviet conditions. As a result of negotiations, the parties signed, in September 1976 in New Delhi, a contract envisaging that within 60 days the buyer would provide the seller with official government assurances that the fissionable material received and used in nuclear power plants with heavy water would not be utilized for development of nuclear weapons. This material

⁷³Collection of major documents on disarmament. Vol. XVIII. 1976, pp.450, 451.

was to be used only for production of energy at nuclear power plants and radioisotopes for agriculture, industry and healthcare. The obtained material was not to be used for development of any nuclear explosive device⁷⁴.

At the request of the Indian government and taking into account its *ideological* constraints concerning peaceful nuclear explosions, the requirement of the non-use of heavy water for the development of peaceful nuclear explosive devices was stated in a separate phrase, which certainly did not change the meaning of the Indian commitment and met the terms of the London Guidelines. However, even after the final conclusion of the contract, the Indian government tried to delay the signature of an agreement with the IAEA. The first consignment of heavy water was sent to India in October-November 1976 and the Agency was duly informed about this.

The relationship between the USSR and Libya in nuclear area was also quite complicated. Libya became a signatory to the NPT in 1975, but the USSR was quite cautious about Libyan intentions to develop a nuclear infrastructure. In 1975, the two parties signed an agreement on cooperation in peaceful nuclear energy uses providing for the construction of a small research reactor and research center in Tajoura near Tripoli. Along with giving its consent to such cooperation, Moscow insisted not only on placing the reactor under IAEA safeguards but also on the permanent presence of Soviet specialists in Tajoura.

Nonetheless, later on, Libya asked the Soviet government to assist in developing a complete nuclear infrastructure, including the construction of a heavy-water reactor using natural uranium. The Libyan prime minister visited Moscow several times in the late 1970s and offered a large sum of money (about \$10 billion) for building a full nuclear fuel cycle. Opinions within the Soviet government varied. The MFA was against such a deal fraught with many dangers. In the end, a reasonable decision prevailed in Moscow, and meanwhile Libya had to abandon the deal anyway, since it did not have enough money when the global oil crisis ended.

In October 1976, the USSR objected to French plans to supply Iran with spent fuel reprocessing and plutonium separation plants. The Soviet statement emphasized that, as it was a matter of supplying sensitive equipment to a Soviet southern neighbor, the development of nuclear weapons in Iran would obviously affect the interests of the Soviet Union.

Some time after adoption of the Guidelines, the USSR passed appropriate legislation reaffirming its international commitments. In early January 1982,

⁷⁴Archives of the Russian Foreign Policy. F.47, op.22, p.200, d.54, ll.143, 144.

the Politburo of the CPSU Central Committee approved the relevant resolution and on January 13, 1982, the Council of Ministers adopted the *Statute on the Export of Nuclear Material, Technology, Equipment, Plants, Special Non-Nuclear Material and Services*. The full text of this statute has not yet been published. According to the Politburo resolution, the MFA, Minsredmash and the Ministry of Foreign Trade had to approve a summary of this document for publishing in the Soviet press (see Appendix 2)⁷⁵.

It is noteworthy that one provision of the statute goes beyond the London Guidelines. It contains a paragraph saying that exported items should not be used for the production of nuclear weapons and nuclear explosive devices and *not be used in such a way as to further any military purpose*. This wording was taken from the IAEA Statute (Article II) and it prohibits, e.g., enriched uranium supplies for use in nuclear power plants of submarines and surface warships.

The statute maintains that draft agreements and contracts with foreign partners concerning nuclear export should be approved by the State Committee on Utilization of Atomic Energy and the MFA.

The statute also includes a list of definitions of nuclear material, technology, equipment and services based on the Trigger List of the London Guidelines⁷⁶.

The Inter-agency Commission on Nonproliferation of Nuclear Weapons, established by the Politburo in the late 1970s, was an important state authority in shaping Soviet policy in the area of nuclear nonproliferation and solving specific issues of nuclear export controls. The body was comprised of various ministries and agencies concerned with nuclear weapons (the MFA, Minsredmash, the Ministry of Defense, the KGB, the Military-Industrial Commission of the Council of Ministers, the Ministry of the Interior, the Ministry of Foreign Trade, the Academy of Sciences, etc.). The First Deputy Foreign Minister Georgy Korniyenko chaired the Commission.

⁷⁵The summary of the approved text of the statute was published in *Vneshnyaya Torgovlya*, No.4, 1982, pp.37, 38 and *Mezhdunarodnaya Zhizn*, No.4, 1982, p.158). As far as I remember, it was decided not to publish the full text because it contained some paragraphs which were not deemed appropriate for publication, including a paragraph regulating nuclear export to nuclear-weapon states. The Guidelines for Nuclear Transfers envisaged no procedure for transfer of nuclear material and equipment to nuclear-weapon states. According to the Soviet statute, decision on transfer of nuclear material to nuclear weapon state should have been taken on individual basis.

⁷⁶On July 18, 1999, Russia adopted the Federal Law «On Export Controls» based on internationally recognized principles and norms of international law which takes into account Russia's commitments in the area of nonproliferation and export controls, including *catch-all* principle.

CHAPTER XII. CHANGES IN THE US POSITION -- THE NEW POLICY OF PRESIDENT CARTER

From the beginning, the USA played an active role in establishing the *London Club* and ensuring the concerted effort of nuclear suppliers as well as the existence of a common export control policy. At the same time, however, Washington demonstrated certain inconsistencies, which appeared to result from debates within governmental circles, the business community, and broader public opinion.

According to the Soviet Mission to the UN (in a letter to MFA of May 1976), the US government officials, non-governmental organizations, and the press were widely discussing export of nuclear equipment and fissile material along two different lines:

The US state authorities, except for a number of Congressmen, shared a belief in the existing principles regulating the export of nuclear equipment (chiefly, nuclear power plants, their key components or research reactors) and fissile material. The list of equipment to be exported did not include uranium enrichment equipment and plants for separating plutonium from irradiated fuel. Nuclear export was allowed only to those states which could ensure the US standards of the physical protection of nuclear material and plants and only if the export supplies were placed under IAEA safeguards. In general, these principles corresponded with the Guidelines for Nuclear Transfers, which were not yet approved and made public, but whose existence was confirmed by the US authorities.

This approach was reflected in the April 1976 report of the ERDA⁷⁷ (ERDA-1542) prepared by the agency in collaboration with the State Department, the Nuclear Regulatory Commission, and the Export-Import Bank of the USA. The report concluded that nuclear more stringent export constraints might result in \$140 billion worth losses by 2000 and the loss of 24,000 jobs. Stricter export controls would have resulted in trailing markets which would be conquered by other states. At the same time, the report cited President Ford, as saying that he would never agree to delay the conclusion of the export agreements or their implementation and would not introduce unilateral additional restraints for nuclear export.

The second position, as reported by the Soviet Mission, was supported by many NGOs and some politicians who believed that nuclear export supplies should

⁷⁷Energy Research and Development Administration (ERDA) -- successor of the US Atomic Energy Commission and predecessor the Department of Energy.

be stipulated with a wide range of constraints or even should be forbidden. Such an attitude towards nuclear export was covered by the press and «was partly reflected in the work of the US Congress»⁷⁸.

President Carter, who was inaugurated in early 1977, made a sensational statement concerning the new US policy in the area of nuclear energy and nonproliferation. On April 7, 1977, i.e. before the final adoption of the Guidelines, President Carter (who used to serve in the US nuclear-powered Navy) stood against using civilian plutonium in the energy sector and put forward the following initiative:

- to suspend for a unspecified time the commercial reprocessing of spent nuclear fuel and the use of the plutonium produced in a nuclear power plant in the repeated nuclear fuel cycle;
- to stop financial support to a spent fuel reprocessing plant in South Carolina;
- to review the program in the field of fast breeder reactors and to postpone the commercial use of such reactors;
- to expand capacity for enrichment of uranium for internal use and for export, with the goal of promoting further development of atomic energy on the basis of only light water moderated reactors;
- to continue the embargo on export of equipment and technology designed for the enrichment of uranium and the reprocessing of spent nuclear fuel;
- to explore the possibility of launching an international nuclear cycle evaluation program aimed at developing alternative fuel cycles⁷⁹.

The reaction on the part of the nuclear-developed states to Carter's decision was mixed and mostly skeptical if not to say negative. Fortunately, the new US initiative did not hamper the work of finalizing the London Guidelines.

In 1977-1980, at the request of the Carter Administration the International Nuclear Cycle Evaluation program (INFCE) was carried out. This program was implemented at the expense of the USA, but the IAEA provided relevant administrative support. According to Soviet experts, the international evaluation demonstrated that the existing world market of nuclear material, equipment, and technology «generally met the demands of the states interested in nuclear energy development and in other areas of peaceful nuclear energy uses»⁸⁰. Former Assistant to the IAEA Director General on External Relations David Fischer made the following commentary about the aforementioned results:

⁷⁸ Archives of the Russian Foreign Policy. F.47, op.22, p.200, d.55, ll.42-48.

⁷⁹ *Weekly Compilation of Presidential Documents*. 11 April 1977, No.15, Vol.13, pp.506, 507. See: Collection of major documents on disarmament. Vol. XIX. 1977, pp.260-262.

⁸⁰ Atom -- Only Peaceful. Op.cit., p.40 (in Russian).

«Despite President Carter's expectations (and, one may add, despite the obvious fact that the reprocessing of spent fuel can directly lead to the acquisition of weapon usable material, while the «once-through» fuel cycle cannot), INFCE conspicuously refrained from identifying any particular fuel cycle as being more «proliferation-prone» than another. INFCE's fundamental and sensible conclusion was that a national decision to acquire nuclear weapons is essentially political and not dependent on the choice of a particular fuel cycle»⁸¹.

Georges Le Guelte shares this opinion. As the Executive Secretary of the INFCE program in his presentation at the international symposium in Tokyo in March 2000 he maintained: «The final conclusion of INFCE, in 1980, was that there are no technical fixes to prevent the dissemination of nuclear weapons. However, the opinion continues to be widely spread, that dissemination of nuclear weapons can be avoided through «proliferation resistant techniques». It seems that at present, no such thing exists as a «proliferation resistant reactor», but if that could be one day achieved, it would not impact non-proliferation policy, simply because reprocessing and plutonium are only one of the routes to acquire nuclear weapons»⁸².

Le Guelte slightly exaggerates the role of technology in solving the problem of nuclear nonproliferation. However, he is quite right by saying that, after all, everything depends on the political decisions of the states.

When the US Congress passed the 1978 Non-Proliferation Act providing for the principle of full-scope safeguards in recipient states as a condition of supply, this «pre-empted, -- as was correctly noted by Fischer, -- the conclusions of the INFCE»⁸³, and the USA lost interest in the program.

Another result of the INFCE was the IAEA decisions to conduct research on the establishment of an international plutonium storage facility (under Article XII.A.5 of the Statute) and on founding the Committee on Assurances of Supply.

However, both projects failed due to serious differences among the participants. Analysis of the reasons for such failure is, however, beyond the scope of the present study.

⁸¹Fischer David. Op.cit., pp.100, 101.

⁸²Le Guelte Georges. Myths and Realities in Nuclear Non-Proliferation. International Symposium «Peaceful Uses of Nuclear Energy and Non-Proliferation: A Challenge for 21 Century». Tokyo. 9-10 March 2000, pp.66-72.

⁸³Fischer David. Op.cit., p.101.

CONCLUSION AND BRIEF EPILOGUE ON THE FURTHER DEVELOPMENT OF INTERNATIONAL EXPORT CONTROL NORMS

Retrospective assessment of the 1975-1977 agreements among nuclear suppliers proves that they were absolutely necessary to promote the establishment of more stringent nuclear nonproliferation measures in the conditions of the growing number of international nuclear transfers. Adoption of the Guidelines for Nuclear Transfers was a historic step in developing the international nuclear nonproliferation regime.

The Guidelines ensured predictability and order for nuclear suppliers and promoted rigorous standards and a common interpretation of approved international commitments. They were aimed at preventing the transformation of normal competition into a process facilitating further proliferation of nuclear weapons and other nuclear explosive devices. The mechanism of consultations among suppliers was to reduce possible limitations on international nuclear trade and cooperation.

A significant result of these joint endeavors was that the agreement on a common policy of nuclear export controls minimized the possibility of applying double standards to nuclear supplies. At that time, many nuclear suppliers practiced this double standard approach. Unfortunately, some nuclear suppliers, including the USA, later began to pursue political and commercial interests regardless of common principles. Nevertheless, it is necessary to stand for a collective approach towards nuclear export controls based on international agreements. Any other approach would be counterproductive and would eventually undermine the international nuclear nonproliferation regime.

It is noteworthy that from the very beginning the NSG, comprised of both the East and the West, was driven by the common goal of strengthening global nonproliferation. Any differences emerging in the group did not divide the states according to the East-West principle. As a rule, there were more contradictions among the Western nations, due to rivalry for markets. The fact, that after the adoption of the Guidelines in 1977, the NSG did not reconvene its meetings for 13 and a half years was not a result of the Cold War confrontation.

The USA, the USSR and the UK made many combined efforts to resume the NSG meetings in order to work out further measures to tighten export controls. During this long period, the NPT Depositories held a number of informal meetings of the NSG members (in the form of business lunches or dinners held in turn by nuclear suppliers). Nonetheless, these meetings bore no tangible fruit. The major reason for the NSG stagnation was commercial interest, i.e.

competition among some suppliers. For a number of states, for instance, the Netherlands⁸⁴, doubts about the advisability of convening the NSG meetings resulted from their unwillingness to spoil relations with recipient nations, which demanded assured nuclear supplies and other preferences in nuclear area.

In the course of preparatory activities leading to the establishment of the *London Club* and in the course of its work, its major proponents -- the USA, the USSR, and the UK -- demonstrated particular tactfulness and attentiveness with respect to such suppliers as France, which initially called into question the advisability of a common export policy. This soft approach contributed to approving a common position towards supplies which collectively prevented the further proliferation of nuclear weapons and other nuclear explosive devices.

After the adoption of the Guidelines, some actual and potential suppliers joined them on a voluntary basis (Australia, Bulgaria, Denmark, Finland, Greece, Hungary, Ireland, Luxembourg, Norway, Portugal, Romania, Spain). Some suppliers unilaterally accepted the principle of full-scope safeguards.

As time passed, there emerged some problems concerning the application of the Trigger List. Since the last meeting of the NSG in London, the *Zangger* Committee amended this list several times. In 1984, the changes concerned equipment for gas centrifuge (INFCIRC/209/Mod.2), in 1985 -- for spent fuel reprocessing (INFCIRC/209/Mod.3), and in 1990 -- for gaseous diffusion plants (INFCIRC/209/Mod.4). In late 1990, the *Zangger* Committee issued a consolidated list -- INFCIRC/209/Rev.1. However, the parties to the London Guidelines formally had to follow the 1977 Trigger List.

Nevertheless, the major motivation for resuming the meetings of nuclear exporters was the discovery of the Iraqi secret nuclear program, which was revealed after its aggression against Kuwait and the 1991 Gulf War. In the course of UN inspections proving Iraq's non-compliance with the NPT, the experts discovered numerous facts concerning supplies from western states (e.g. Germany), including dual-use equipment and material.

As a result, on March 5-7, 1991, 26 suppliers convened in the Hague for an informal meeting. In the communique of the meeting exporters paid particular attention to the possibility of the potential employment of dual-use material, equipment, and technology to produce nuclear explosive devices. It further established a working group to prepare appropriate export control agreements.

⁸⁴Interview with Piet de Klerk in June 2000.

The next significant step was the NSG plenary session in Warsaw on March 31-April 3, 1992, during which it was decided to approve measures for controlling the export of dual-use items and to adopt a list of 65 such items. The regime came into force on January 1, 1993. The point-of-contact for dual-use arrangements and the NSG is the Permanent Mission of Japan to the IAEA.

At the same time, the Warsaw meeting passed a declaration demanding that full-scope safeguards be a condition of the transfer of new supplies to any non-nuclear weapon state. The declaration was not applicable to prior supplies. It was published in May 1992 as INFCIRC/405. At the next meeting of the NSG in Lucerne, Switzerland, on March 30 -- April 1, 1993, the group made appropriate amendments to the Guidelines. It was also decided that new members would join the NSG, having taken into account the agreed criteria, on the basis of consensus.

The Final version of the Guidelines for direct-use items were issued in March 2000 as INFCIRC/254/Rev.4/Part 1 and for dual-use items as INFCIRC/254/Rev.4/Part 2.

At present (in 2000), the NSG consists of 38 states:

Australia	Germany	Portugal
Austria	Great Britain	Romania
Argentina	Greece	Russia
Belgium	Hungary	Slovakia
Brazil	Ireland	South Korea
Bulgaria	Italy	South Africa
Belarus	Japan	Spain
Canada	Latvia	Sweden
Cyprus	Luxembourg	Switzerland
Czech Republic	Netherlands	Turkey
Denmark	New Zealand	Ukraine
Finland	Norway	United States of
France	Poland	America

The European Commission is a permanent observer. Slovenia attended the latest NSG plenary meeting, also as an observer.

GLOSSARY OF TERMS

Effective kilogram -- a) for plutonium: its weight in kilograms; b) for uranium with an enrichment of 0.01 (1%) and above: its weight in kilograms multiplied by the square of its enrichment; c) for uranium with an enrichment below 0.01 (1%) and above 0.005 (0.5%): its weight in kilograms multiplied by 0.0001; and d) for depleted uranium with an enrichment of 0.005 (0.5%) or below, and for thorium: its weight in kilograms multiplied by 0.00005 (INFCIRC/153, p.104).

Full-scope safeguards -- IAEA safeguards applied to all peaceful nuclear activities of a non-nuclear weapon state.

Source material -- uranium containing a mixture of isotopes occurring in nature; uranium depleted in the isotope 235; thorium; any of the foregoing in the form of a metal, alloy, chemical compound, or concentrate; any other material containing one or more of the foregoing in such concentration as the Board of Governors shall from time to time determine; and such other material as the Board of Governors shall from time to time determine (Article XX.3 of the IAEA Statute).

Special fissionable material -- plutonium-239; uranium-233; uranium enriched in the isotopes 235 or 233; any material containing one or more of the foregoing; and such other fissionable material as the Board of Governors shall from time to time determine. The term «special fissionable material» does not include source material (Article XX.1 of the IAEA Statute).

Wassenaar Arrangements -- the regime of export control over conventional arms and dual-use goods and technologies.

LIST OF ABBREVIATIONS

A-bomb -- atomic bomb
ACDA -- Arms Control and Disarmament Agency
CEA -- Commissariat a L'energie Atomique
CIRUS -- Canadian-Indian Reactor Uranium System
COCOM -- Coordinating Committee for Multilateral Export Controls
CPSU -- Communist Party of the Soviet Union
DOE -- Department of Energy
ERDA -- Energy Research and Development Administration
FRG -- Federal Republic of Germany
HEU -- highly-enriched uranium
IAEA -- International Atomic Energy Agency
INFCE -- International Nuclear Fuel Cycle Evaluation
INFCIRC -- information circular
KGB -- Committee for State Security
MEPhI -- Moscow Engineering and Physics Institute
MFA -- Ministry of Foreign Affairs
Minatom -- Ministry of Atomic Energy
Minsredmash -- Ministry of Medium Machine-Building -- predecessor of
Minatom
MW -- megawatt
NAM -- Non-Aligned Movement
NGO -- non-governmental organization
NPP -- nuclear power plant
NPT -- Non-Proliferation Treaty
NSG -- Nuclear Suppliers Group
PNE -- peaceful nuclear explosion
UF -- uranium fluoride
UK -- United Kingdom
UN -- United Nations
US -- United States
USA -- United States of America
USSR -- Union of Soviet Socialist Republics

APPENDIX 1. GUIDELINES FOR NUCLEAR TRANSFERS

Communications Received from Certain Member States Regarding Guidelines for the Export of Nuclear Material, Equipment or Technology

1. On 11 January 1976, the Director General received similar letters, all of that date, from the Resident Representatives to the Agency of Czechoslovakia, France, the German Democratic Republic, Japan, Poland, Switzerland, the Union of Soviet Socialist Republics and the United States of America, relating to the export of nuclear material, equipment or technology. In the light of the request at the end of each of those letters, the text is reproduced below as Letter I.

2. On the same day, the Resident Representatives to the Agency of Canada and Sweden also addressed analogous letters to the Director General. In the light of the request expressed at the end of each of those letters, their texts are reproduced below as Letter II and Letter III respectively.

3. On the same day, the Director General received similar letters from the Resident Representatives to the Agency of Belgium, the Federal Republic of Germany, the Netherlands and the United Kingdom of Great Britain and Northern Ireland, Members of the European Communities, relating to the export of nuclear material, equipment or technology. In the light of the request expressed at the end of each of those letters, the text is reproduced below as Letter IV.

4. On 11 January 1978 the Resident Representative to the Agency of Italy, a Member of the European Communities, addressed a letter to the Director General relating to the same subject, the text of which is reproduced below as Letter V.

5. On 11 January 1978 the Director General received complementary letters, all of that date, from the Resident Representatives to the Agency of Belgium, Czechoslovakia, the German Democratic Republic, Japan, Poland, Switzerland and the Union of Soviet Socialist Republics, the texts of which are reproduced below as Letters VI, VII, VIII, IX, X, XI and XII respectively.

6. The attachments to Letters I-V. which are in every case identical, setting forth the Guidelines for Nuclear Transfers with their Annexes, are reproduced in the Appendix.

Letter I

The Permanent Mission of presents its compliments to the Director General of the International Atomic Energy Agency and has the honour to

enclose copies of three documents which have been the subject of discussion between the Government ofand a number of other Governments.

The Government of has decided that, when considering the export of nuclear material, equipment or technology, it will act in accordance with the principles contained in the attached documents.

In reaching this decision, the Government of is fully aware of the need to contribute to the development of nuclear power in order to meet world energy requirements, while avoiding contributing in any way to the dangers of a proliferation of nuclear weapons or other nuclear explosive devices, and of the need to remove safeguards and non-proliferation assurances from the field of commercial competition.

The Government of hopes that other Governments may also decide to base their own nuclear export policies upon these documents.

The Government of requests that the Director General of the International Atomic Energy Agency should circulate the texts of this note and its enclosures to all Member Governments for their information and as a demonstration of support by the Government of for the Agency's non-proliferation objectives and safeguards activities.

The Permanent Mission of avails itself of this opportunity to renew to the Director General of the International Atomic Energy Agency the assurances of its highest consideration.

Letter II

The Permanent Mission of Canada to the IAEA presents its compliments to the Director General and has the honour to enclose copies of three documents that have been the subject of discussion between the Government of Canada and a number of other Governments.

The Government of Canada has decided that, when considering the export of nuclear material, equipment or technology, it will act in accordance with the principles contained in the attached documents as well as other principles considered pertinent by it.

In reaching this decision, the Government of Canada is fully aware of the need to contribute to the development of nuclear power in order to meet world energy requirements, while avoiding contributing in any way to the dangers of a proliferation of nuclear weapons or other nuclear explosive devices, and of

the need to remove safeguards and non-proliferation assurances from the field of commercial competition.

The Government of Canada hopes that other Governments may also decide to base their own nuclear export policies upon these documents and such further principles as may be agreed upon.

The Government of Canada requests that the Director General of the International Atomic Energy Agency should circulate the text of this Note and its enclosures to all Member Governments for their information and as a demonstration of support by the Government of Canada for the Agency's non-proliferation objectives and safeguard activities.

The Permanent Mission of Canada to the IAEA avails itself of this opportunity to renew to the Director General the assurances of its highest consideration.

Letter III

The Permanent Mission of Sweden present their compliments to the Director General of the International Atomic Energy Agency have the honour to enclose copies of three documents which have been the subject of discussion between the Government of Sweden and a number of other Governments.

The Government of Sweden have decided that when considering the export of nuclear material, equipment or technology, they will act in accordance with the principles contained in the attached documents.

In reaching this decision, the Government of Sweden are fully aware of the need to avoid contributing in any way to the dangers of a proliferation of nuclear weapons or other nuclear explosive devices, and of the need to remove safeguards and non-proliferation assurances from the field of commercial competition.

The Government of Sweden hope that other Governments may also decide to base their own nuclear export policies upon these documents.

The Government of Sweden request that the Director General of the International Atomic Energy Agency should circulate the text of this Note and its enclosures to all Member Governments for their information and as a demonstration of support by the Government of Sweden for the Agency's non-proliferation objectives and safeguards activities.

The Permanent Mission of Sweden take this opportunity to renew to the Director General of the International Atomic Energy Agency the assurances of their highest consideration.

Letter IV

The Permanent Mission of to the International Organizations in Vienna presents its compliments to the Director General of the International Atomic Energy Agency and has the honour to enclose copies of three documents which have been the subject of discussion between the and a number of other Governments.

The Government of has decided that, when considering the export of nuclear material, equipment or technology, it will act in accordance with the principles contained in the attached documents.

In reaching this decision, the Government of is fully aware of the need to contribute to the development of nuclear power in order to meet world energy requirements, while avoiding contributing in any way to the dangers of a proliferation of nuclear weapons or other nuclear explosive devices, and of the need to remove safeguards and non-proliferation assurances from the field of commercial competition.

As a Member of the European Community, the Government of so far as trade within the Community is concerned, will implement these documents in the light of its commitments under the Treaties of Rome where necessary.

The Government of hopes that other Governments may also decide to base their own nuclear export policies upon these documents.

The Government of requests that the Director General of the International Atomic Energy Agency should circulate the texts of this Note and its enclosures to all Member Governments for their information and as a demonstration of support by the Government of for the Agency's non-proliferation objectives and safeguards activities.

The Permanent Mission of to the International Organizations in Vienna avails itself of this opportunity to renew to the Director General of the International Atomic Energy Agency the assurances of its highest consideration.

Letter V

The Permanent Mission of Italy present their compliments and have the honour to enclose copies of three documents which have been the subject of discussion between the Government of Italy and a number of other Governments.

The Government of Italy have decided that when considering the export of nuclear material, equipment or technology, they will act in accordance with the principles contained in the attached documents.

In reaching this decision, the Government of Italy are fully aware of the need to contribute to the development of nuclear power in order to meet world energy requirements, while avoiding contributing in any way to dangers of a proliferation of nuclear weapons or other nuclear explosive devices, and of the need to remove safeguards and non-proliferation assurances from the field of commercial competition,

The Italian Government underline that the undertaking referred to cannot limit in any way the rights and obligations arising for Italy out of agreements to which she is a Party and in particular those arising out of Article IV of the Non-Proliferation Treaty.

As a Member of the European Community, the Government of Italy, so far as trade within the Community is concerned, will implement these documents in the light of their commitments under the Treaties of Rome where necessary.

The Government of Italy hope that other Governments may also decide to base their own nuclear export policies upon these documents.

The Government of Italy request that the Director General of the International Atomic Energy Agency should circulate the texts of this Note and its enclosures to all Member Governments for their information and as a demonstration of support by the Government of Italy for the Agency's non-proliferation objectives and safeguards activities.

Letter VI

The Permanent Mission of Belgium presents its compliments to the Director General of the IAEA and, in addition to its Note P 10-92/24 of 11 January 1978, would like to draw the attention to the following.

The Government of Belgium at present are not in a position to implement fully the principles for technology transfer set out in the documents attached to the above-mentioned Note because of the lack of appropriate laws and regulations. However, the Government of Belgium intend to implement these principles

fully when appropriate laws and regulations for this purpose are put into force as necessary.

The Government of Belgium request that the Director General of the IAEA should circulate the text of this Note to all Member Governments for their information.

The Permanent Mission of Belgium takes this opportunity to renew to the Director General of the IAEA the assurance of its highest consideration.

Letter VII

The Permanent Mission of the Czechoslovak Socialist Republic to the International Organizations presents its compliments to the Director General of the International Atomic Energy Agency and has the honour to refer to its Note No. 1036/78 regarding standards of the nuclear export policies which have been adopted by the members of the Nuclear Suppliers Group.

The Government of the Czechoslovak Socialist Republic greatly appreciates the role of the International Atomic Energy Agency in the sphere of control of the provisions of the Non-Proliferation Treaty. This activity has been an important instrument of preventing proliferation of nuclear weapons. Sharing the opinion that further strengthening of safeguards lies in the interest of universal peace, the Government of the Czechoslovak Socialist Republic has decided that it would deliver nuclear material, equipment and technology defined in a trigger list, to any non-nuclear-weapon State only in a case when the whole nuclear activity of a recipient country, and not only material, equipment and technology being transferred, are subject to the Agency's safeguards.

The Government of the Czechoslovak Socialist Republic expresses its opinion that this principle, if observed by all the States - nuclear suppliers, could have made a great contribution toward strengthening and universality of the Non-Proliferation Treaty.

The Permanent Mission of the Czechoslovak Socialist Republic to the International Organizations avails itself of this opportunity to renew to the Director General of the International Atomic Energy Agency the assurances of its highest consideration.

Letter VIII

The Permanent Mission of the German Democratic Republic to the International Organizations in Vienna presents its compliments to the Director General of the International Atomic Energy Agency and has the honour, in

connection with Note No.2/78-III addressed to the Director General of the IAEA on 11 January 1978, to state the following: in the view of the Government of the German Democratic Republic, the guidelines for nuclear exports are such as to strengthen the regime of non-proliferation of nuclear weapons and the IAEA safeguards system. The German Democratic Republic will also in future advocate agreements to the effect that nuclear exports under the trigger list mentioned in the above Note should go only to those non-nuclear-weapon States that accept IAEA safeguards for all of their nuclear activities.

The Government of the German Democratic Republic is convinced that any reinforcement of the regime of non-proliferation of nuclear weapons will promote the peaceful uses of nuclear energy and international co-operation in this area.

The Permanent Mission requests that the present text be circulated as an official document of the International Atomic Energy Agency.

The Permanent Mission of the German Democratic Republic to the International Organizations in Vienna avails itself of this opportunity to renew to the Director General of the International Atomic Energy Agency the assurances of its highest consideration.

Letter IX

The Embassy of Japan presents its compliments to the International Atomic Energy Agency and, in reference to its Note No. J.M. 78/21 of January 11, 1978, has the honour to inform the International Atomic Energy Agency of the following.

The Government of Japan at present is not in a position to implement fully the Principles for Technology Transfers set out in the documents attached to the above-mentioned Note because of the lack of appropriate laws and regulations.

However, the Government of Japan intends to implement these principles fully when appropriate laws and regulations for this purpose are put into force as necessary.

The Government of Japan requests that the Director General of the International Atomic Energy Agency be good enough to circulate the texts of this Note to all Member Governments for their information.

The Embassy of Japan avails itself of this opportunity to renew to the International Atomic Energy Agency the assurances of its highest consideration.

Letter X

The Permanent Mission of the Polish People's Republic to the International Atomic Energy Agency presents its compliments to the Director General of the IAEA and has the honour to refer to its Note No.10-96/77 regarding standards of the nuclear export policies which have been adopted by the members of the Nuclear Suppliers Group.

The Government of the Polish People's Republic greatly appreciates the role of the International Atomic Energy Agency in the sphere of control of the provisions of the Non-Proliferation Treaty. This activity has been an important instrument of preventing proliferation of nuclear weapons. Sharing the opinion that further strengthening of safeguards lies in the interest of universal peace, the Government of the Polish People's Republic has decided that it would deliver nuclear material, equipment and technology defined in a trigger list to any non-nuclear-weapon State only in a case when the whole nuclear activity of a recipient country, and not only material, equipment and technology being transferred, are subject to the Agency's safeguards.

The Government of the Polish People's Republic expresses its opinion that this principle, if observed by all the States - nuclear suppliers, could have made a great contribution toward strengthening and universality of the Non-Proliferation Treaty.

The Government of the Polish People's Republic requests that the Director General of the IAEA should circulate the text of this Note to all Member Governments.

The Permanent Mission of the Polish People's Republic to the International Atomic Energy Agency avails itself of this opportunity to renew to the Director General of the IAEA the assurances of the highest consideration.

Letter XI

The Permanent Mission of Switzerland presents its compliments to the Director General of the International Atomic Energy Agency and, with reference to its today's Note No.003, has the honour to emphasize the following.

The Government of Switzerland at present is not in a position to implement fully the principles for Technology Transfers set out in the documents attached

to the above- mentioned Note because of the lack of appropriate laws and regulations. However, the Government of Switzerland intends to implement these principles fully when appropriate laws and regulations for this purpose are put into force as necessary.

The Government of Switzerland requests that the Director General of the International Atomic Energy Agency should circulate the text of this Note to all Member Governments for their information.

The Permanent Mission of Switzerland avails itself of this opportunity to renew to the Director General of the International Atomic Energy Agency the assurances of its highest consideration.

Letter XII

With reference to Note Verbale No.1 from the Permanent Mission of the USSR, dated 11 January 1978, I have the honour to send you the following Declaration of the Government of the USSR:

«The Government of the Union of Soviet Socialist Republics emphasizes its determination to continue its efforts to secure agreement between countries supplying nuclear materials, equipment and technology on the principle that IAEA safeguards must be applied to all nuclear activities of non-nuclear-weapon States when those States receive any of the items mentioned in the initial list referred to in the above-mentioned Note Verbale. In this connection the Government of the USSR takes the view that the principle of full control is a necessary condition for ensuring effective safeguards which can prevent nuclear materials, equipment and technology from being used for manufacturing nuclear weapons or other nuclear explosive devices».

The Government requests that the text of the present letter be distributed as an official document of the IAEA.

Appendix **Guidelines for Nuclear Transfers**

1. The following fundamental principles for safeguards and export controls should apply to nuclear transfers to any non-nuclear-weapon State for peaceful purposes. In this connection, suppliers have defined an export trigger list and agreed on common criteria for technology transfers.

Prohibition on nuclear explosives

2. Suppliers should authorize transfer of items identified in the trigger list only upon formal governmental assurances from recipients explicitly excluding uses which would result in any nuclear explosive device.

Physical protection

3. (a) All nuclear materials and facilities identified by the agreed trigger list should be placed under effective physical protection to prevent unauthorized use and handling. The levels of physical protection to be ensured in relation to the type of materials, equipment and facilities, have been agreed by suppliers, taking account of international recommendations.
- (b) The implementation of measures of physical protection in the recipient country is the responsibility of the Government of that country. However, in order to implement the terms agreed upon amongst suppliers, the levels of physical protection on which these measures have to be based should be the subject of an agreement between supplier and recipient.
- (c) In each case special arrangements should be made for a clear definition of responsibilities for the transport of trigger list items.

Safeguards

4. Suppliers should transfer trigger list items only when covered by IAEA safeguards, with duration and coverage provisions in conformance with the GOV/1621 guidelines. Exceptions should be made only after consultation with the parties to this understanding.
5. Suppliers will jointly reconsider their common safeguards requirements, whenever appropriate.

Safeguards triggered by the transfer of certain technology

6. (a) The requirements of paragraphs 2; 3 and 4 above should also apply to facilities for reprocessing, enrichment, or heavy-water production, utilizing technology directly transferred by the supplier or derived from transferred facilities, or major critical components thereof.
- (b) The transfer of such facilities, or major critical components thereof, or related technology, should require an undertaking (1) that IAEA safeguards apply to any facilities of the same type (i.e. if the design, construction or operating processes are based on the same or similar physical or chemical processes, as defined in the trigger list) constructed during an agreed period in the recipient country and (2) that there should at all times be in effect a safeguards agreement permitting the IAEA to apply Agency safeguards with respect to such facilities identified by the recipient, or by the supplier in consultation with the recipient, as using transferred technology.

Special controls on sensitive exports

7. Suppliers should exercise restraint in the transfer of sensitive facilities, technology and weapons-usable materials. If enrichment or reprocessing facilities, equipment or technology are to be transferred, suppliers should encourage recipients to accept, as an alternative to national plants, supplier

involvement and/or other appropriate multinational participation in resulting facilities. Suppliers should also promote international (including IAEA) activities concerned with multinational regional fuel cycle centres.

Special controls on export of enrichment facilities, equipment and technology

8. For a transfer of an enrichment facility, or technology therefor, the recipient nation should agree that neither the transferred facility, nor any facility based on such technology will be designed or operated for the production of greater than 20% enriched uranium without the consent of the supplier nation, of which the IAEA should be advised.

Controls on supplied or derived weapons-usable material

9. Suppliers recognize the importance, in order to advance the objectives of these guidelines and to provide opportunities further to reduce the risks of proliferation, of including in agreements on supply of nuclear materials or of facilities which produce weapons-usable material, provisions calling for mutual agreement between the supplier and the recipient on arrangements for reprocessing, storage, alteration, use, transfer or retransfer of any weapons-usable material involved. Suppliers should endeavour to include such provisions whenever appropriate and practicable.

Controls on retransfer

10. (a) Suppliers should transfer trigger list items, including technology defined under paragraph 6, only upon the recipient's assurance that in the case of:
- (1) retransfer of such items, or
 - (2) transfer of trigger list items derived from facilities originally transferred by the supplier, or with the help of equipment or technology originally transferred by the supplier; the recipient of the retransfer or transfer will have provided the same assurances as those required by the supplier for the original transfer.
- (b) In addition the supplier's consent should be required for: (1) any retransfer of the facilities, major critical components, or technology described in paragraph 6; (2) any transfer of facilities or major critical components derived from those items; (3) any retransfer of heavy water or weapons-usable material.

Supporting Activities

Physical security

11. Suppliers should promote international co-operation on the exchange of physical security information, protection of nuclear materials in transit, and recovery of stolen nuclear materials and equipment.

Support for effective IAEA safeguards

12. Suppliers should make special efforts in support of effective implementation of IAEA safeguards. Suppliers should also support the Agency's efforts to assist Member States in the improvement of their national systems of accounting and control of nuclear material and to increase the technical effectiveness of safeguards.

Similarly, they should make every effort to support the IAEA in increasing further the adequacy of safeguards in the light of technical developments and the rapidly growing number of nuclear facilities, and to support appropriate initiatives aimed at improving the effectiveness of IAEA safeguards.

Sensitive plant design features

13. Suppliers should encourage the designers and makers of sensitive equipment to construct it in such a way as to facilitate the application of safeguards.

Consultations

14. (a) Suppliers should maintain contact and consult through regular channels on matters connected with the implementation of these guidelines.
- (b) Suppliers should consult, as each deems appropriate, with other Governments concerned on specific sensitive cases, to ensure that any transfer does not contribute to risks of conflict or instability.
- (c) In the event that one or more suppliers believe that there has been a violation of supplier/recipient understandings resulting from these guidelines, particularly in the case of an explosion of a nuclear device, or illegal termination or violation of IAEA safeguards by a recipient, suppliers should consult promptly through diplomatic channels in order to determine and assess the reality and extent of the alleged violation.

Pending the early outcome of such consultations, suppliers will not act in a manner that could prejudice any measure that may be adopted by other suppliers concerning their current contacts with that recipient.

Upon the findings of such consultations, the suppliers, bearing in mind Article XII of the IAEA Statute, should agree on an appropriate response and possible action which could include the termination of nuclear transfers to that recipient.

15. In considering transfers, each supplier should exercise prudence having regard to all the circumstances of each case, including any risk that technology transfers not covered by paragraph 6 or subsequent retransfers might result in unsafeguarded nuclear materials.

of on-load operation or employing technically sophisticated positioning or alignment features to allow complex off-load fuelling operations such as those in which direct viewing of or access to the fuel is not normally available.

2.1.4. Reactor control rods:

Rods especially designed or prepared for the control of the reaction raft in a nuclear reactor as defined in paragraph 2.1.1 above.

2.1.5. Reactor pressure tubes:

Tubes which are especially designed or prepared to contain fuel elements and the primary coolant in a reactor as defined in paragraph 2.1.1 above at an operating pressure in excess of 50 atmospheres.

2.1.6. Zirconium tubes:

Zirconium metal and alloys in the form of tubes or assemblies of tubes, and in quantities exceeding 500 kg per year, especially designed or prepared for use in a reactor as defined in paragraph 2.1.1 above, and in which the relationship of hafnium to zirconium is less than 1:500 parts by weight.

2.1.7. Primary coolant pumps:

Pumps especially designed or prepared for circulating liquid metal as primary coolant for nuclear reactors as defined in paragraph 2.1.1 above.

2.2. *Non-nuclear materials for reactors:*

2.2.1. Deuterium and heavy water:

Deuterium and any deuterium compound in which the ratio of deuterium to hydrogen exceeds 1:5000 for use in a nuclear reactor as defined in paragraph 2.1.1 above in quantities exceeding 200 kg of deuterium atoms for any one recipient country in any period of 12 months.

2.2.2. Nuclear grade graphite:

Graphite having a purity level better than 5 parts per million boron equivalent and with a density greater than 1.50 grams per cubic centimetre in quantities exceeding 30 metric tons for any one recipient country in any period of 12 months.

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

2.4.1. Plants for the fabrication of fuel elements.

2.5.1. Equipment, other than analytical instruments, especially designed or prepared for the separation of isotopes of uranium.

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

Clarifications of certain of the items on the above list are annexed.

Part B. Common criteria for technology transfers under paragraph 6 of the Guidelines

1) *Technology* means technical data in physical form designated by the supplying country as important to the design, construction, operation, or maintenance of enrichment, re-processing, or heavy water production facilities or major critical components thereof, but excluding data available to the public, for example, in published books and periodicals, or that which has been made available internationally without restrictions upon its further dissemination.

2) *Major critical components* are:

- a) in the case of an isotope separation plant of the gaseous diffusion type: diffusion barrier;
- b) in the case of an isotope separation plant of the gas centrifuge type: gas centrifuge assemblies, corrosion-resistant to UF₆;
- c) in the case of an isotope separation plant of the jet nozzle type: the nozzle units;
- d) in the case of an isotope separation plant of the vortex type: the vortex units.

3) For facilities covered by paragraph 6 of the Guidelines for which no major critical component is described in paragraph 2 above, if a supplier nation should transfer in the aggregate a significant fraction of the items essential to the operation of such a facility, together with the knowhow for construction and operation of that facility, that transfer should be deemed to be a transfer of «facilities or major critical components thereof».

4) The definitions in the preceding paragraphs are solely for the purposes of paragraph 6 of the Guidelines and this Part B, which differ from those applicable to Part A of this Trigger List, which should not be interpreted as limited by such definition.

5) For the purposes of implementing paragraph 6 of the Guidelines, the following facilities should be deemed to be «of the same type (i.e. if their design, construction or operating processes are based on the same or similar physical or chemical processes)»:

Where the technology transferred is such as to make possible the construction in the recipient State of a facility of the following type, or major critical components thereof:

- a) an isotope separation plant of the gaseous diffusion type.....
- b) an isotope separation plant of the gas centrifuge type.....
- c) an isotope separation plant of the jet nozzle type.....
- d) an isotope separation plant of the vortex type.....
- e) a fuel reprocessing plant using the solvent extraction process.....
- f) a heavy water plant using the exchange process.....
- g) a heavy water plant using the electrolytic process.....
- h) a heavy water plant using the hydrogen distillation process.....

The following will be deemed to be facilities of the same type:

- any other isotope separation plant using the gaseous diffusion process
- any other isotope separation plant using the gas centrifuge process
- any other isotope separation plant using the jet nozzle process
- any other isotope separation plant using the vortex process
- any other fuel reprocessing plant using the solvent extraction process
- any other heavy water plant using the exchange process
- any other heavy water plant using the electrolytic process
- any other heavy water plant using the hydrogen distillation process

Note: In the case of reprocessing, enrichment, and heavy water facilities whose design, construction, or operation processes are based on physical or chemical processes other than those enumerated above, a similar approach would be applied to define facilities «of the same type», and a need to define major critical components of such facilities might arise.

6) The reference in paragraph 6(b) of the Guidelines to «any facilities of the same type constructed during an agreed period in the recipient's country» is understood to refer to such facilities (or major critical components thereof), the first operation of which commences within a period of at least 20 years from the date of the first operation of (1) a facility which has been transferred or incorporates transferred major critical components or of (2) a facility of the

same type built after the transfer of technology. It is understood that during that period there would be a conclusive presumption that any facility of the same type utilized transferred technology. But the agreed period is not intended to limit the duration of the safeguards imposed or the duration of the right to identify facilities as being constructed or operated on the basis of or by the use of transferred technology in accordance with paragraph 6(b)(2) of the Guidelines.

Annex

Clarifications of Items on the Trigger List

A. *Complete nuclear reactors*

(Item 2.1.1 of the Trigger List)

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

2. The export of the whole set of major items within this boundary will take place only in accordance with the procedures of the Guidelines. Those individual items within this functionally defined boundary which will be exported only in accordance with the procedures of the Guidelines are listed in paragraphs 2.1.1 to 2.1.5.

The Government reserves to itself the right to apply the procedures of the Guidelines to other items within the functionally defined boundary.

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

B. *Pressure vessels*

(Item 2.1.2 of the Trigger List)

4. A top plate for a reactor pressure vessel is covered by item 2.1.1 as a major shop-fabricated part of a pressure vessel.

5. Reader internals (e. g. support columns and plates for the core and other vessel internals, control rod guide tubes, thermal shields, baffles, core grid plates, diffuser plates, etc.) are normally supplied by the reactor supplier. In some cases, certain internal support components are included in the fabrication

of the pressure vessel. These items are sufficiently critical to the safety and reliability of the operation of the reactor (and, therefore, to the guarantees and liability of the reactor supplier), so that their supply, outside the basic supply arrangement for the reactor itself, would not be common practice. Therefore, although the separate supply of these unique, especially designed and prepared, critical, large and expensive items would not necessarily be considered as falling outside the area of concern, such a mode of supply is considered unlikely.

C. *Reactor control rods*
(Item 2. 1. 4 of the Trigger List)

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

D. *Fuel reprocessing plants*
(Item 2. 3. 1 of the Trigger List)

7. A *plant for the reprocessing of irradiated fuel elements* includes the equipment and components which normally come in direct contact with and directly control the irradiated fuel and the major nuclear material and fission product processing streams. The export of the whole set of major items within this boundary will take place only in accordance with the procedures of the Guidelines. In the present state of technology, the following items of equipment are considered to fall within the meaning of the phrase «and equipment especially designed or prepared therefor»:

(a) Irradiated fuel element chopping machines: remotely operated equipment especially designed or prepared for use in a reprocessing plant as identified above and intended to cut, chop or shear irradiated nuclear fuel assemblies, bundles or rods; and

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

8. The Government reserves to itself the right to apply the procedures of the Guidelines to other items within the functionally defined boundary.

E. *Fuel fabrication plants*
(Item 2.4. 1 of the Trigger List)

9. A plant for the fabrication of fuel elements includes the equipment:

- (a) Which normally comes in direct contact with, or directly processes, or controls, the production flow of nuclear material, or
- (b) Which seals the nuclear material within the cladding.

10. The export of the whole set of items for the foregoing operations will take place only in accordance with the procedures of the Guidelines. The Government will also give consideration to application of the procedures of the guidelines to individual items intended for any of the foregoing operations, as well as for other fuel fabrication operations such as checking the integrity of the cladding or the seal, and the finish treatment to the sealed fuel.

F. *Isotope separation plant equipment*
(Item 2.5.1 of the Trigger List)

11. Equipment, other than analytical instruments, especially designed or prepared for the separation of isotopes of uranium includes each of the major items of equipment especially designed or prepared for the separation process. Such items include:

- gaseous diffusion barriers;
- gaseous diffuser housings, gas centrifuge assemblies, corrosion-resistant to UF₆;
- jet nozzle separation units;
- vortex separation units;
- large UF₆ corrosion-resistant axial or centrifugal compressors;
- special compressor seals for such compressors.

Annex B
Criteria for Levels of Physical Protection

1. The purpose of physical protection of nuclear materials is to prevent unauthorized use and handling of these materials. Paragraph 3(a) of the Guidelines document calls for agreement among suppliers on the levels of protection to be ensured in relation to the type of materials, and equipment and facilities containing these materials, taking account of international recommendations.

2. Paragraph 3(b) of the Guidelines document states that implementation of measures of physical protection in the recipient country is the responsibility of the Government of that country. However, the levels of physical protection on which these measures have to be based should be the subject of an agreement between supplier and recipient. In this context these requirements should apply to all States.

3. The document INFCIRC/225 of the International Atomic Energy Agency entitled «The Physical Protection of Nuclear Material» and similar documents which from time to time are prepared by international groups of experts and updated as appropriate to account for changes in the state of the art and state of knowledge with regard to physical protection of nuclear material are a useful basis for guiding recipient States in designing a system of physical protection measures and procedures.

4. The categorization of nuclear material presented in the attached table or as it may be updated from time to time by mutual agreement of suppliers shall serve as the agreed basis for designating specific levels of physical protection in relation to the type of materials, and equipment and facilities containing these materials, pursuant to paragraph 3(a) and 3(b) of the Guidelines document.

5. The agreed levels of physical protection to be ensured by the competent national authorities in the use, storage and transportation of the materials listed in the attached table shall as a minimum include protection characteristics as follows:

Category III

Use and Storage within an area to which access is controlled.

Transportation under special precautions including prior arrangements among sender, recipient and carrier, and prior agreement between entities subject to the jurisdiction and regulation of supplier and recipient States, respectively, in case of international transport specifying time, place and procedures for transferring transport responsibility.

Category II

Use and Storage within a protected area to which access is controlled, i.e. an area under constant surveillance by guards or electronic devices, surrounded by a physical barrier with a limited number of points of entry under appropriate control, or any area with an equivalent level of physical protection.

Transportation under special precautions including prior arrangements among sender, recipient and carrier, and prior agreement between entities subject to the jurisdiction and regulation of supplier and recipient States, respectively, in case of international transport, specifying time, place and procedures for transferring transport responsibility.

Category I

Materials in this Category shall be protected with highly reliable systems against unauthorized use as follows:

Use and Storage within a highly protected area, i.e. a protected area as defined for Category II above, to which, in addition, access is restricted to persons whose trustworthiness has been determined, and which is under surveillance by guards who are in close communication with appropriate response forces. Specific measures taken in this context should have as their objective the detection and prevention of any assault, unauthorized access or unauthorized removal of material.

Transportation under special precautions as identified above for transportation of Category II and III materials and, in addition, under constant surveillance by escorts and under conditions which assure close communication with appropriate response forces.

6. Suppliers should request identification by recipients of those agencies or authorities having responsibility for ensuring that levels of protection are adequately met and having responsibility for internally co-ordinating response/recovery operations in the event of unauthorized use or handling of protected materials. Suppliers and recipients should also designate points of contact within their national authorities to co-operate on matters of out-of-country transportation and other matters of mutual concern.

^a As identified in the Trigger List.

^b Material not irradiated in a reactor or material irradiated in a reactor but with a radiation level equal to or less than 100 rads/hour at one metre unshielded.

^c Less than a radiologically significant quantity should be exempted.

^d Natural uranium, depleted uranium & thorium & quantities of uranium enriched to less than 10% not falling in Category III should be protected in accordance with prudent management practice.

^e Although this level of protection is recommended, it would be open to States, upon evaluation of the specific circumstances, to assign a different category of physical protection.

^f Other fuel which by virtue of its original fissile material content is classified as Category I or II before irradiation may be reduced one category level while the radiation level from the fuel exceeds 100 rads/hour at one meter unshielded.

Reference: International Atomic Energy Agency. Information Circular INFCIRC/254, February 1978.

APPENDIX 2. STATUTE ON THE EXPORT OF NUCLEAR MATERIAL, TECHNOLOGY, EQUIPMENT, PLANTS, SPECIAL NON-NUCLEAR MATERIAL, AND SERVICES

On January 13, 1982, the Council of Ministers of the USSR approved the Statute on the Export of Nuclear Material, Technology, Equipment, Plants, Special Non-Nuclear Material, and Services. Below we publish the summary of this document.

The Statute regulates the export of nuclear material, technology, equipment, plants, special non-nuclear material, and services (nuclear exports of the USSR) for peaceful purposes from the USSR to non-nuclear weapon states.

Definitions of terms contained in the Statute and concerning nuclear material, technology, equipment, plants, special non-nuclear material, and services are given in the appendix to this Statute.

Nuclear export from the USSR is carried out in compliance with the policy of the Soviet Union in the area of nuclear nonproliferation and in conformity with Soviet commitments under the NPT and other international treaties and agreements, to which the USSR is party.

Nuclear export from the USSR to non-nuclear weapon states can take place only upon formal governmental assurances from recipients that the exported items, nuclear and special non-nuclear material derived from the exports, equipment, and plants:

- a) shall not be diverted from peaceful use to nuclear weapons and other nuclear explosive devices and shall not be used in such a way as to further any military purpose;
- b) shall be placed under International Atomic Energy Agency safeguards throughout the entire term of their use;
- c) shall be guarded at a sufficient level of physical protection not lower than that recommended by the Agency;
- d) shall be re-transferred or transferred in accordance with this Statute; retransfer or transfer of exported items shall take place only upon the written approval of the corresponding Soviet foreign trade organization (in case of a multi-phase retransfer, such approval shall be applied for from the Soviet foreign trade organization directly or from intermediate exporters).

The above-mentioned commitments shall be given a legally-binding form by the authorities of recipient nations in the form of the acceptance of such obligations with respect to specific nuclear supplies from the USSR or in the

form of the reference to such obligations in effective treaties, agreements, contracts, and other legal documents, to which the USSR, its authorities or organizations are party.

Nuclear export transactions of the Soviet Union are carried out by foreign trade organizations of the Ministry of Foreign Trade and the State Committee on External Economic Relations of the USSR. Draft contracts and/or agreements with foreign agents with respect to nuclear export shall be approved by the State Committee for the Utilization of Atomic Energy of the USSR and the Ministry of Foreign Affairs of the USSR.

Nuclear export items shall be shipped from the USSR only upon the aforementioned assurances of the recipient nation to the Soviet foreign trade organization concerned and only upon the existence of a safeguards agreement between the recipient nation and the Agency and all other additional documents of such an agreement required to ensure such safeguards.

If the recipient state breaches the commitments provided for in this Statute, the USSR shall stop its nuclear export supplies until such a violation is eliminated.

Simultaneously with the suspension of nuclear exporting, the Ministry of Foreign Trade and the State Committee on External Economic Relations of the USSR in interactions, as appropriate with the Ministry of Foreign Affairs and the State Committee on Utilization of Atomic Energy of the USSR, shall take measures in accordance with international law and the international treaties of the USSR to ensure full compliance by the recipient nation to its commitments.

Annex

Nuclear material, technology, equipment, plants, special non-nuclear material, and services shall be defined as follows:

1. Nuclear material means uranium (depleted, natural or enriched, including uranium-233), plutonium and thorium; any of the foregoing in the form of a metal, alloy, chemical compound, or concentrate in quantities exceeding (for any one recipient country in any period of 12 months limits specified in sub-paragraph «a», except material specified in sub-paragraph «b»):

a) enriched uranium (including

uranium-233), plutonium	50 effective grams
natural uranium	500 kilograms
depleted uranium	1,000 kilograms
thorium	1,000 kilograms

b) plutonium with an isotopic concentration of plutonium-238 exceeding 80%.

Uranium or plutonium used in gram quantities or less as a sensing component in instruments.

Depleted uranium or thorium which the government is satisfied will be used only in non-nuclear activities, such as the production of alloys or ceramics, as a result of which they become completely non-regenerating.

2. *Technology* means data in any form (including samples of material or equipment and knowledge transferred in the process of education) designated as important to the design, construction, operation, maintenance, or testing of nuclear material, equipment, plants, and special non-nuclear material.

3. Equipment and plants means any equipment and plants especially designed or prepared for the processing, use or production of special fissionable and non-nuclear material, including:

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

3.2. Reactor pressure vessels:

Metal vessels, as complete units or as major shop-fabricated parts thereof, which are especially designed or prepared to contain the core of a nuclear reactor as defined in paragraph 3.1 above and are capable of withstanding the operating pressure of the primary coolant.

3.3. Reactor fuel charging and discharging machines:

Manipulative equipment especially designed or prepared for inserting or removing fuel in a nuclear reactor as defined in paragraph 3.1 above capable of on-load operation or employing technically sophisticated positioning or alignment features to allow complex off-load fuelling operations such as those in which direct viewing of or access to the fuel is not normally available.

3.4. Reactor control rods:

Rods especially designed or prepared for the control of the reaction rate in a nuclear reactor as defined in paragraph 3.1 above.

3.5. Reactor pressure tubes:

Tubes which are especially designed or prepared to contain fuel elements and the primary coolant in a reactor as defined in paragraph 3.1 above at an operating pressure in excess of 50 atmospheres.

3.6. Zirconium tubes:

Zirconium metal and alloys in the form of tubes or assemblies of tubes, and in quantities exceeding 500 kg per year, especially designed or prepared for use in a reactor as defined in paragraph 3.1 above, and in which the relationship of hafnium to zirconium is less than 1:500 parts by weight.

3.7. Primary coolant pumps:

Pumps especially designed or prepared for circulating liquid metal as primary coolant for nuclear reactors as defined in paragraph 3.1 above.

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

3.9. Plants for the fabrication of fuel elements.

3.10. Equipment, other than analytical instruments, especially designed or prepared for the separation of isotopes of uranium.

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

4. Special non-nuclear materials:

4.1. Deuterium and heavy water:

Deuterium and any deuterium compound in which the ratio of deuterium to hydrogen exceeds 1:5000 for use in a nuclear reactor as defined in paragraph 3.1 above in quantities exceeding 200 kg of deuterium atoms for any one recipient country in a period of 12 months.

4.2. Nuclear grade graphite:

Graphite having a purity level better than 5 parts per million boron equivalent and with a density greater than 1.50 grams per cubic centimeter in quantities exceeding 30 metric tons for any one recipient country in a period of 12 months.

5. Services mean the operations performed by the Soviet Union relating to changes in form or characteristics of nuclear and special non-nuclear material belonging to a foreign contractor, including the enrichment of isotopes of nuclear material, the fabrication of nuclear fuel, and the reprocessing of spent nuclear fuel.

Reference: Vneshnyaya Torgovlya, No.4, 1982, pp.37, 38.

ABOUT THE AUTHOR

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Amb. Timerbaev participated in negotiating the NPT, the ABM Treaty, the IAEA safeguards system, the Threshold Test Ban Treaty, the PNE Treaty and some other arms control agreements. In 1974-1978, he participated in the work to establish the Nuclear Suppliers Group. Amb. Timerbaev took part in all six NPT Review Conferences.

Roland Timerbaev is Doctor of History, Professor, who delivered lectures in the MGIMO, the Monterey Institute of International Studies and the Moscow Engineering Physics Institute.

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