
INTERNATIONAL SEMINAR
ON THE
ROLE OF EXPORT CONTROLS
IN NUCLEAR NON-PROLIFERATION

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PREFACE

On 7 and 8 October 1997, an International Seminar on the Role of Export Controls in Nuclear Non-proliferation was held at the Vienna International Centre, Austria.

This seminar was aimed as an important, but not final step in promoting transparency within the framework of dialogue and cooperation on the role of export controls in nuclear non-proliferation and nuclear trade. It provided an opportunity for states and non-governmental organizations, both within and outside the Nuclear Suppliers Group, to pose questions, raise topics and exchange views on nuclear export controls.

This publication contains the papers presented by the speakers at the seminar, together with the opening and closing remarks by the chairperson of the seminar, Mr Abdul S. Minty. The seminar's programme and list of participants have been included in this booklet as well.

Chair's Opening Remarks

*Mr Abdul S. Minty, Chair of the Seminar
Chairperson, South African Council for the
Nonproliferation of Weapons of Mass Destruction and
Governor of South Africa to the IAEA*

First let me welcome all of you to this International Seminar on the Role of Export Controls in Nuclear Non-Proliferation coordinated by the Nuclear Suppliers Group (NSG). It is most encouraging to see so many experts and senior representatives gathered here from such a broad range of states and institutions to exchange ideas and experiences on how we manage one of the great challenges on the international nuclear agenda. This challenge can broadly be described as the interrelated objectives of preventing the proliferation of nuclear weapons, and the promotion of international trade and co-operation in the peaceful uses of nuclear energy.

At its Plenary meeting in Buenos Aires on 25-26 April 1996, the NSG decided to respond substantively and positively to the call at the 1995 NPT Review and Extension Conference for greater transparency in nuclear related export controls within a framework of dialogue and cooperation by establishing a Transparency Working Group. This Group is currently chaired by Ms Martine Letts from the Australian Permanent Mission in Vienna. A background paper written by the Transparency Working Group on the origins, role and activities of the NSG has been reproduced as an IAEA document (INFCIRC/539), copies of which are available at the documents desk outside this room.

This seminar has been coordinated by the Transparency Working Group as a further, but not final step to promote transparency within a framework of dialogue and cooperation on the role export controls play in nuclear non-proliferation and in the promotion of nuclear trade.

I would like to thank the Transparency Working Group and its chair Ms Letts, as well as the program coordinator Mr Kees Nederlof of the Netherlands Permanent Mission in Vienna and the excellent staff of the NSG's Point of Contact at the Permanent Mission of Japan in Vienna for the time and effort they have devoted to the organisation of the seminar. We owe particular thanks to the Director-General of the International Atomic Energy Agency (IAEA), Dr Hans Blix, for making available the premises of the IAEA Board Room for the seminar and to his staff in the IAEA Secretariat led by Mr Kardos who are assisting with logistic arrangements.

This seminar is very important because, while it can be said that the NPT Review and Extension Conference inspired this particular event, it has long been clear that the objectives of the nuclear supplier arrangements have not always been fully understood or properly explained. There have been outreach activities, and members of these supplier arrangements have explained bilaterally and multilaterally why they have chosen to come together regularly to pursue nuclear non-proliferation objectives through a common export control policy and an exchange of information on developments of nuclear proliferation concern.

The expansion of the NSG from seven founding members in the seventies to the current membership of 34 - soon to be 35 - attests to the dynamic nature of the arrangement. The Guidelines governing the supplier arrangements of the NSG and Zangger Committee are public documents. The Memorandum of Understanding governing the Dual-Use Arrangement is now available to anyone, thanks to a decision taken at the 1997 NSG Plenary in Ottawa, Canada.

Still, more needs to be done. Equity and the simple fact that the number of actual and potential nuclear suppliers continues to grow makes it more imperative than ever to understand what these export control regimes are designed to achieve.

The sponsors have invited experts and governmental representatives from ALL states as well as experts from international organisations and academic and industry specialists so that all actual and potential suppliers are included and to promote a genuine, open and all-inclusive dialogue. In the same vein, the seminar program aims to ensure that points of view from all constituencies have the opportunity to be represented.

The program is divided into four separate sessions - with one keynote speaker and two commentators per session. Keynote speakers will have a maximum of twenty minutes to make their initial presentation and the commentators a maximum of fifteen minutes. This will be followed by a ten-minute exchange between the three session speakers after which the floor will be open to all participants. Today, sessions one and two are of three hours' duration. We will break for lunch from 1300 to 1500.

Tomorrow, session three will run from 1000 to 1200 and session four from 1400 to 1530. The final panel discussion where all twelve speakers are invited to participate, will take place from 1530 to 1730. We have been obliged to curtail somewhat sessions three and four on the second day to allow sufficient time for the panel discussion. However, as the panel discussion immediately succeeds session four, we can be flexible about completing discussion on session four if necessary.

I encourage participants to raise specific points of clarification on the presentations by the speakers before making observations. While our deliberations are divided into four thematic sessions, all areas are interrelated. Should a question or observation occur to you in session three, which strictly speaking belongs to session one, do not hesitate to raise it then. There will also be an opportunity to revisit the themes of all four sessions during the final panel discussion.

Should any of the speakers or participants wish to distribute any written remarks, please consult the conference officers who will arrange for reproduction and distribution. As for the four keynote papers, for which our particular thanks must go to the authors, I suggest that they be treated as informal working papers for the seminar.

Finally, I would like to remind you that the format of this seminar is designed to create the best conditions for an open, informal exchange of information and for a genuine exchange of views. No formal records will be taken and no official report of proceedings will be published. I encourage all participants to make full use of the informality of the occasion to

raise any points or questions which will stimulate a thorough discussion on the role of export controls in nuclear non-proliferation.

Comments and statements should not be attributed to the persons who have made them, although they can be referred to without attribution. Of course, those who make comments are free to disclose them if they so wish.

While we will not formally record the discussion, I do intend to take notes of common themes and issues which seem to me particularly noteworthy for the final panel discussion. Keeping in mind that this seminar is designed to support the process of transparency, dialogue and cooperation, we may well want to make at least a mental note of matters which require additional work or follow up and how this might best be pursued.

I would like to convey apologies for the absence of the current Chair of the NSG, Dr Agnes Bishop of Canada. Her representative, Mr Jim Casterton, is however present. In returning to the agenda, and the first session of our seminar, I would like to extend a warm welcome to Dr Blix, who requires no introduction and invite him to deliver the keynote speech for the first session on the subject of the international nuclear non-proliferation regime. I would also like to welcome the two commentators for this session, Dr Fritz Schmidt, Chair of the Zangger Committee and Dr P. Rama Rao, President of the Indian Academy of Sciences, both of whom I will introduce briefly just before they speak.

Biographical Information:

During 1994, Mr Abdul S Minty was appointed as the Deputy Director-General for Multilateral Affairs in the Department of Foreign Affairs, South Africa and currently serves as Chairman of both the South African Council for the Non-Proliferation of Weapons of Mass Destruction and the South African Council for Space Affairs.

Mr Abdul Samad Minty was born in Hartebeesfontein in the Wester Transvaal and grew up in Johannesburg, South Africa. In June 1958, he left South Africa and resumed his studies in London, where he became involved in the Defence and Aid Fund for Southern Africa. Mr Minty was a founding member of the Boycott Movement in London, which was organized in conjunction with the African National Congress and Congress Movement of South Africa in 1959 to boycott South African goods in protest of Apartheid. The Boycott Movement later changed its name to the Anti-Apartheid Movement (AAM), of which Mr Minty became Membership Secretary before becoming its Honorary Secretary in 1962, a post to which he has been re-elected each year.

As a law student at Leeds University, Mr Minty urged the vice-chancellor of the university to nominate Chief Albert Luthili, President General of the ANC for the Nobel Peace Prize and wrote to various personalities in Scandinavia to support the nomination. Chief Luthili was awarded the prestigious prize in 1961.

Mr Minty received both a B.Sc degree in Economics and an M.Sc degree in International Relations from the University College in London and was then awarded a Fellowship by the Richardson Institute for Conflict and Peace Research in London. His academic research covered South African Foreign and Defence policies and the effectiveness of sanctions.

In 1979, at the suggestion of the United Nations, the AAM initiated the World Campaign against Military and Nuclear Collaboration with South Africa with Mr Minty as its Director.

Mr Minty has published a number of specialist articles and booklets and participated in a large number of United Nations' and other seminars and conferences. He has been invited to address the UN Security Council on four occasions as an individual expert and has appeared several times before its Arms Embargo Committee. He has represented the AAM at nearly every Commonwealth Summit since 1961 (with the exception of two).



Keynote Speech, Session 1

***Dr Hans Blix, Director General Emeritus
International Atomic Energy Agency***

I am pleased to address this seminar organized by the Nuclear Suppliers Group as a contribution to better understanding of the role of the group and of its guidelines. I shall try to describe the setting in which export controls are placed - the main elements of international efforts to stem the further spread of nuclear weapons. Naturally I shall focus on the role of international verification - which is the special responsibility of the IAEA.

Let me say at the outset that I am optimistic about the outlook for non-proliferation. The incentive to acquire nuclear weapons is in large measure - though perhaps not exclusively - linked to how States perceive their security situation. If security is seen as a lessening problem, as *is* the case in most regions of the world, then the incentive to move to nuclear weapons is diminished. If, further, there is a general movement away from nuclear weapons, as is slowly the case in nuclear-weapon States, this movement, too, will reduce the incentive. In the areas where we presently see the greatest risk of further proliferation, the *front line efforts* to impede it will, in my view, need to be in the areas of foreign policy, security policy and economic policy - aiming particularly at building trust and détente. But international verification is also a vital element - it can act as a confidence building measure contributing to the creation of trust and subsequently help maintain that trust. It should also sound the warning when the basis for trust is threatened. Export controls and restrictions are yet another means of reducing the risk of further proliferation.

The Non-Proliferation Regime

The array of measures designed to prevent the further spread of nuclear weapons is often referred to as the “non-proliferation regime”. The expression, in my view, is a bit of a deliberate overstatement. The word “regime” to me suggests a *legally binding order*. Some of the measures in this regime are, indeed, legally binding agreements, but they are binding only for the parties to them. Other measures may not be of a legal character. The regime consists of a network of global, regional and bilateral agreements in which States commit themselves not to manufacture or possess nuclear weapons - the Non-Proliferation Treaty (NPT) with over 180 adherents being the central pillar. The respect for these commitments is verified by the system of international safeguards - and performing those inspections is one of the IAEA’s principal responsibilities.

The guidelines established by suppliers of nuclear and nuclear-related materials, technology and equipment to regulate the trade in these items is a further element of the regime. Yet another component is the measures taken by countries to ensure the “physical protection” of nuclear material and facilities - that is, the barriers erected to prevent illegal access to or use of nuclear items by individuals or groups. Such physical protection measures are the responsibility of individual countries. However, the international convention on physical protection establishes amongst other things rules for the protection of nuclear material which is being moved from one country to another. The IAEA has established guidelines on

measures to be adopted for the domestic protection of such material. In a wider definition, yet other measures might be included in the concept of a non-proliferation regime: e.g. negative and positive security assurances against the use or the threat of use of nuclear weapons and other nuclear arms control accords and the Comprehensive Nuclear Weapons Test Ban Treaty.

From the beginning of the nuclear era export controls and export restrictions have been seen as indispensable. Indeed the earliest attempts to arrest the further spread of nuclear weapons were based on policies of denying access to nuclear materials. By the 1950s it was apparent that simple denial would not work. A system had to be devised that made it possible to exploit the potential benefits of nuclear energy while ensuring that its use was exclusively peaceful. This realization was the basis for the Atoms for Peace policy and the creation, forty years ago, of the IAEA. The policies of denial gave way to systems for controlled exports. The manner in which States exercise this control over the export of nuclear items and the extent of the control was for a long time a matter of heated debate - including in the IAEA where for many years a special committee of the Board - the Committee on Assurance of Supply - deliberated on the matter. It should also be noted that the level of caution exercised regarding exports has risen much over time. Comprehensive safeguards were not required as a condition for export in the early days. And while the NPT does not prohibit the export of reprocessing or enrichment plants, non-proliferation concerns today would rule out practically all such export.

Today it would seem that while concerns and criticism still persist that some restrictions may amount to a denial of technology, there is a considerably greater area of common understanding of the need for systems of export control. Evidence of this growing understanding has been the steady increase in membership of mechanisms such as the Zangger Committee and the Nuclear Suppliers Group. The recent announcement by China regarding the strengthening of controls on its nuclear exports is further evidence. There has also been a widening recognition that policies of export restrictions are not a matter only for this or that group of suppliers and that there is a need for greater transparency as called for by the "Principles and Objectives" document of the 1995 NPT Review and Extension Conference. Your seminar and the broad participation in it perhaps also testifies to this. I don't think we have come so far that we could try to develop a consensus on export controls in the IAEA, but there is more understanding - especially after the realization how much Iraq was able to import toward its programme of enrichment of uranium.

The Non-Proliferation Outlook

I mentioned that I am optimistic about the prospects for non-proliferation. Let me spend a few minutes telling you why.

The continued relaxation of tensions in international relations is facilitating tangible progress in the area of nuclear disarmament, arms control and non-proliferation. The projected cutting of American and Russian arsenals by two thirds under the START treaties, the agreement by more than 140 States on the Comprehensive Test Ban Treaty (CTBT) and the expected but delayed negotiation of an agreement to cut off production of fissile material for weapons purposes are vital steps towards further reducing the threat of nuclear weapons, and of limiting their spread.

In recent years, a number of major developments have taken place with respect to States' legal undertakings not to manufacture or acquire nuclear weapons and to accept IAEA safeguards on existing and future nuclear activities. Let me mention some examples in this regard:

- Two declared nuclear-weapon States, China and France, have joined the NPT and have made voluntary offers to accept IAEA safeguards on parts of their nuclear materials in peaceful use;
- Two former nuclear “threshold” States - Argentina and Brazil - have opened their nuclear programmes to joint inspection and subsequently accepted comprehensive IAEA safeguards;
- South Africa disclosed the existence of a nuclear weapons programme, destroyed its nuclear weapons, joined the NPT and co-operated in the implementation of subsequent IAEA verification measures and safeguards;
- The dissolution of the Soviet Union resulted in the emergence of three new independent States with nuclear weapons on their territories - Ukraine, Belarus and Kazakhstan. All three renounced the nuclear weapons option, joined the NPT as non-nuclear-weapon States and have accepted comprehensive IAEA safeguards. In addition, all other new States which emerged as a result of the dissolution of the Soviet Union acceded to the NPT;
- In May 1995, the then 178 States party to the NPT decided to extend the treaty indefinitely and reaffirmed, *inter alia*, that nuclear disarmament is a treaty commitment on the part of the recognized nuclear weapon States. Given the divergent views among parties to the Treaty on key issues of Treaty implementation, this was a significant achievement. I might note that the International Court of Justice has also determined that nuclear disarmament negotiations are an obligation;
- The decision on the extension, and the package of proposals adopted at the end of the NPT Conference, signaled important agreement among the overwhelming majority of States of the international community. Under this agreement, nuclear non-proliferation, nuclear disarmament and international co-operation regarding the peaceful uses of nuclear energy should be “vigorously pursued”. Progress made, and achievements and shortcomings should be evaluated periodically;
- Besides these global developments, the wide acceptance of commitments to nuclear non-proliferation is also demonstrated by the establishment of different regional nuclear-weapon-free zones. With the wide adherence to the now 30 year old Treaty for the Prohibition of Nuclear Weapons in Latin America and the Caribbean (Treaty of Tlatelolco) and to the South Pacific Nuclear Free Zone Treaty (Treaty of Raratonga), these treaties have become effective instruments for the consolidation of the regime of military denuclearization of the two regions. In addition, the entry into force this year of the 1996 Treaty on the South East Asia Nuclear-Weapon-Free Zone (Treaty of Bangkok) and the signature by a large number of African States of the 1996 African Nuclear-Weapon-Free Zone Treaty (Treaty of Pelindaba), together with the already effective Antarctic Treaty, have

extended the net of nuclear weapon free commitments to almost all the countries and territories of the southern hemisphere and beyond.

International Verification

While there are thus many reasons for satisfaction, I should also note, however, that in two cases specific and unambiguous commitments to nuclear non-proliferation have proved illusory. In the wake of the Gulf War it was discovered that Iraq, a party to the NPT and a comprehensive safeguards agreement, had violated its obligation by actively pursuing a nuclear weapons programme. After more than six years of the most extensive and intrusive inspection regime and the discovery, mapping and destruction of Iraq's clandestine nuclear weapons programme, questions still remain, showing the difficulty of positively proving the *absence* of relevant nuclear material and equipment. In the Democratic People's Republic of Korea (DPRK), also a party to the NPT, Agency inspection pointed to inaccuracies in information, suggesting that the DPRK had produced more plutonium than it had declared to our inspectors. Despite various international efforts the DPRK remains in non-compliance with its safeguards agreement with the IAEA, and the DPRK's initial declaration of its nuclear material cannot be verified. Indeed, we have not even got DPRK's agreement to preserve evidence which may be required later to verify the initial declaration.

It is evident that any verification system will need to evolve over time - to meet changing demands and to take advantage of advances in verification technologies - and the Agency's safeguards system had indeed been evolving. However, the shock discoveries in Iraq required more than an incremental response. It led to a fundamental review of the safeguards system and the systematic introduction over the last six years of new strengthening measures - involving greater access for Agency inspectors to information and locations and the wider use of new techniques such as environmental sampling. It has also led to rethinking of other elements of the non-proliferation regime, not least the systems of export controls.

The main issue addressed in the review of the safeguards system after Iraq was the ability of Agency verification activities to detect undeclared nuclear activities. Hitherto the safeguards system had been largely based on nuclear material accountancy - analogous to a financial accounting system with the Agency playing the role of auditor. The "classical" safeguards system focused on the *correctness* of information provided by the State and not to the *completeness* of that information. This is precisely the problem.

When a State accedes to the NPT or assumes a comparable non-proliferation undertaking, and provides the IAEA with an "initial report" describing its nuclear material and facilities, as required by the relevant safeguards agreement, how can the IAEA be confident that the initial report is complete? Even a detailed investigation may not produce the relevant results when historical records are incomplete or other information substantiating the initial report is not available. This is a difficult problem, particularly when a State has a sizeable nuclear programme and could have produced unsafeguarded weapon-usable material prior to entering into a non-proliferation commitment and accepting comprehensive safeguards. Moreover, even if initial reports are complete there remains the possibility, as occurred in Iraq, that a State might subsequently build secret facilities or secretly produce nuclear material. The main thrust of the changes introduced in the safeguards system has been to give the Agency improved tools for assessing the completeness of the coverage of safeguards, thereby allowing

us to gain greater assurance that all nuclear activities - not just the ones we are shown - are indeed peaceful.

One of the first measures undertaken to bolster the ability of the Agency to examine the possible existence of nuclear material which should have been declared, was the explicit assertion and confirmation - even before the revelations in Iraq - of the right of the Agency to perform special inspections.

If before 1991 the Agency had systematically monitored media, it might have seen some smoke coming from Iraq. After the revelations the Agency began systematically to scan media for proliferation cues. Another measure taken early after the Iraq revelation was to demand *early* information about installations in which nuclear material was to be inserted.

Other measures which have been introduced under the legal authority provided by current safeguards agreements include the collection and analysis of information on a so far unprecedented scale and an environmental sampling programme permitting the Agency to note the absence, or detect the presence of, undeclared nuclear activities.

Further, as we all know, the Agency's Board of Governors adopted, in May 1997, a Model Protocol additional to Safeguards Agreements which will - when accepted by States - provide the Agency with complementary legal authority to implement a number of new safeguards measures. It is gratifying, that, in addition to States with comprehensive safeguards obligations, the five nuclear-weapon States have expressed their intention to apply those measures provided for in the Model Protocol that each of them identifies as capable of contributing to the non-proliferation and efficiency aims of the Protocol and as consistent with their obligations under the NPT. Many Non-Nuclear-Weapon States see such application as equitable. It is also hoped that States not parties to comprehensive safeguards agreements with the Agency will implement, to the extent they are able to do so, measures contained in the Protocol.

Since its adoption by the Board of Governors, six States - Armenia, Australia, Georgia, Philippines, Poland and Uruguay have signed the Additional Protocol. Two of them, Armenia and Georgia, undertook the commitment to apply the Protocol provisionally, pending its ratification. The outlook for early broad acceptance is good: the EU, Japan, Canada and others have signaled that they are moving towards early acceptance.

Strengthened Safeguards

Let me outline now the new measures which have been, are being or will be introduced.

First is the group of *measures to strengthen the Agency's access to information*. Measures taken in this area in recent years include: early provision of design information on declared facilities (in order to provide the Agency with the earliest possible warning of a new facility coming under safeguards); greater use of data on nuclear activities that are available in-house or in the public domain; improved analysis and evaluation of all relevant information available to the Agency; use of environmental sampling; and a voluntary reporting scheme on the export and import of nuclear material, non-nuclear material, and specified equipment.

The latter scheme provides the Agency with additional information regarding the movements of nuclear material and activities that involve the processing of material.

Under the Additional Protocol, many of these measures are codified and made obligatory - resulting in the Agency having access to a broader range of information on a State's nuclear activities and thereby creating greater transparency.

A second group of measures relate to *increased physical access to sites and to the effectiveness of that access*. As I have already noted, one early step was the IAEA Board's reaffirmation of the Agency's right to carry out special inspections. A second component is the voluntary offers made by some governments to accept Agency visits "any time, any place".

The Additional Protocol provides, *inter alia*, for:

- unrestricted access for Agency inspectors to locations on nuclear sites and other locations in the State where nuclear material is indicated to be present;
- access beyond nuclear sites, arranged on a case-by-case basis, in order to follow up on information or to implement technical measures such as the collection of environmental samples.

A third group of measures is directed at *rationalization and administrative streamlining of the safeguards system*. Measures already taken include: the expanded use of the IAEA's two regional safeguards offices in Toronto and Tokyo; the New Partnership Approach agreement with the Euratom Inspectorate; the implementation by a large number of States of simplified designation procedures for inspectors; and greater use of unattended measurement and surveillance equipment with remote transmission of data, in lieu of some inspections.

Further measures which are being implemented or contemplated pursuant to Additional Protocols to safeguards agreements include:

- expanded capability for inspectors to communicate with headquarters;
- expanded joint use of equipment and laboratories by the IAEA and State Systems of Accountancy for and Control (SSAC) of nuclear materials.

The test of these new measures will be that they enhance the effectiveness of the system and be cost-effective. Experience gained in extensive trials in the implementation of the new measures suggests that they can be implemented without much additional intrusion or cost to the States involved. The Agency recognizes, however, the potential sensitivity associated with the implementation of the new measures. It has recently embarked upon a process of updating its confidentiality regime to ensure effective protection against disclosure of commercial, technological and industrial secrets as well as other confidential information coming to its knowledge. It is also embarking on a series of consultations with States on the practicalities of implementation.

Cost-effectiveness is another important issue. It cannot be considered in isolation from a matter of no less importance, namely what degree of assurance the system is to provide. A technical system to verify that something is *not* existing or happening on a State-wide basis

cannot achieve a 100% assurance. The Agency's task must be rather to provide a suitably high level of assurance of the non-diversion of nuclear material from declared activities and of the absence of undeclared nuclear material and activities. However, "no diversion" and "no undeclared nuclear activities" are negatives that cannot be detected. They can only be inferred by the absence of evidence to the contrary. There is a close interrelationship between the amount and quality of information and access provided to the Agency on the one hand and the level of assurance that can be gained from an absence of findings on the other. A comparison of the cases of South Africa - where the Agency enjoyed close co-operation and a high degree of access to relevant data - with that of Iraq, illustrates what I mean.

Export Controls and the Non-Proliferation Regime

Let me now return to the role of export controls in the non-proliferation regime from the Agency's perspective. As I mentioned earlier, export control is an important component in the efforts to prevent further nuclear proliferation. This was underlined in the consensus statement of 31 January 1992 by the United Nations Security Council in which the Council, *inter alia*, underlined the "the importance of effective export controls".

The operation of any system of nuclear verification presupposes the ability to track the physical whereabouts of items of interest - including when they are exported and when imported. Thus safeguards agreements contain provisions for reporting on international transfers of nuclear material and can cover other relevant items. Expanded reporting requirements are now being put in place. More extensive reporting - for example to cover nuclear source material intended for non-nuclear uses - will help provide a fuller picture of a country's nuclear activities. As we have observed in the case of Iraq, States without substantial indigenous supplies can, through imports, accumulate large inventories of nuclear source material to support a clandestine programme. Moreover, information on the exports and imports of items other than nuclear material - namely, equipment and non-nuclear material commonly used in the nuclear industry - was, in the past, only required by the specific provisions of INFCIRC/66/Rev.2-type safeguards agreements - that is, the agreements used for safeguarding specific facilities or material but where the State has not accepted comprehensive safeguards pursuant to non-proliferation commitments. The new strengthened safeguards provisions now cover these items.

In the period immediately after the Gulf War the Board of Governors sought to close this gap by adopting a voluntary scheme for reporting on transfers of nuclear material, and specified equipment and non-nuclear material. The scheme has now been operating for more than five years. It currently comprises 52 Agency Member States, including most major nuclear supplier States, as well as Euratom. Information obtained through the scheme provides additional transparency in international nuclear trade, and helps the Agency gain a more complete understanding of all nuclear activities in a State.

However, the scheme has limitations - it is voluntary and not all States participate. The recognition of the need to provide the Agency with more comprehensive information on States' exports and imports of all nuclear material in peaceful activities and with information about exports and imports of specified equipment and non-nuclear material especially designed and prepared for nuclear uses was reflected in the recent negotiations of the Model Additional Protocol. States parties to the Additional Protocol will have a legal obligation to provide the Agency with information on exports and confirmation of imports of such

materials. By adopting the Model Additional Protocol and its Annexes, the Agency has established its own list of specified equipment and non-nuclear material for the reporting of exports and imports, which will be updated as and when required by the Agency. Needless to say this provision of the Protocol will oblige States to have a mechanism for import and export control - if only to know what items are entering or leaving the country.

In comparing the information required by the Agency under the Protocol and the Trigger List as elaborated by the NSG, it will be noted that the Agency does not require information about dual-use items. However, there is no doubt that greater transparency and increased co-operation among the suppliers and importers of such items will also be helpful from the perspective of the overall level of confidence in the conclusions of safeguards verification.

While the aims of international verification and the work on nuclear supplier guidelines have the same end goal - the prevention of proliferation - and a high degree of complementarity, it should also be observed that there are differences in the way the information is to be used. A State for example may ultimately exercise its power to deny permission to export: that is, to act directly to prevent a development of concern. This power is not directly available to the Agency - nor has it been suggested it should. Observation by the Agency of a State's import of various items help us to do our specific job - that of verifying observance of commitments made. Such observation may lead the Agency to a suspicion which it might confirm through other measures, including inspection, that the State is seeking to violate non-proliferation commitments. But the Agency's role is not one of a policeman directly able to intervene. Rather, its role is that of the watchdog, alert and where necessary prepared to report to the Security Council in the event of evidence of a violation.

Concluding Remarks

The revelations of recent years of breaches to non-proliferation undertakings have been quickly acted on by the international community. The system of international safeguards has been changed and, once the provisions of the Additional Protocol are accepted by States, the assurance provided will be greatly enhanced. Other elements of the non-proliferation regime have also been upgraded, not least the NSG of which you will hear more from the experts in the course of this seminar. Also, it will be noted that the various elements of the non-proliferation regime have their respective roles and should complement each other - this they are doing. There are also areas of overlap and redundancy between the various elements - which is not surprising and indeed desirable in such a sensitive area of international security and where no one mechanism is able to provide unequivocal assurance.

As we have seen in the case of Iraq, it was possible for a country to evade the safeguards system in force at that time. It was also able to acquire a vast assortment of equipment as well as raw materials for a weapon programme - despite the supplier controls then applying. Finally, it appears to have escaped detection by the various national intelligence capabilities. While efforts are clearly being made to remedy apparent shortcomings, it is equally clear that 100% assurance can never be achieved by any one of the measures I mentioned. It must be admitted that even when all systems are brought to bear, there is still a possibility that illegal activities could go undetected. And it is to be noted that while most scenarios assume State complicity in any such clandestine activity, the incidents of illegal trafficking in nuclear items remind us of the further - though rather remote - possibility of proscribed activities by sub-national groups. It is perhaps these persistent concerns that encourage thought of counter-

proliferation by enhanced national detection capacity and defensive and/or offensive military capabilities directed at suspected proliferators.

I will not pass judgement on the merits of investment in such further layers of assurance - but I think it is also unlikely that such systems would be able to deliver 100% assurance. I would rather hazard that the relatively small costs of multilateral verification systems represent a very cost-effective investment. Further investments in such systems might give more dividends than some billion dollar alternatives. You get what you pay for....

Biographical Information:

Dr Hans Blix was appointed Director General of the International Atomic Energy Agency in 1981 and was re-appointed for a fourth term of office by the IAEA General Conference in September 1993. He retired on the expiry of that term in 1997 and was awarded the title of Director General Emeritus by the General Conference.

Dr Blix studied at the University of Uppsala, at Columbia University, where he was also a research graduate, and at Cambridge, where he received his Ph.D. In 1959 he earned his Doctor of Law at Stockholm University and in 1960 was appointed associate professor of international law.

From 1963 to 1976 Dr Blix was Head of Department at the Ministry of Foreign Affairs in Sweden and served as Adviser on International Law. In 1976 he became Under-Secretary of State at the Ministry of Foreign Affairs and was in charge of international development co-operation. In October 1978 he was appointed Minister for Foreign Affairs.

From 1961 until 1981 he was a member of Sweden's delegation to the United Nations General Assembly, and from 1962 to 1978 was a member of the Swedish delegation to the Conference on Disarmament in Geneva.

In addition, Dr Blix has written several books on subjects associated with international and constitutional law and was leader of the Liberal Campaign Committee in favour of retention of the Swedish nuclear energy programme in the referendum of 1980.

Dr Blix has Honorary Doctorates from Moscow State University (1987), the University of Bucharest (1994) and the University of Managua, Nicaragua (1996) and is a recipient of the Henry de Wolf Smyth Award (Washington, D.C., 1988), the FORATOM Award for 1994, the Goldenes Ehrenzeichen für Verdienste um die Republik Österreich (1997), Middle Cross of the Order of Merit of the Republic of Hungary (1997), Grand Cordon of the Order of the Sacred Treasure, Government of Japan (1997) and Ordre de Saint-Charles (Commandeur), Principality of Monaco (1997).



Commentary 1, Session 1

*Dr Fritz W. Schmidt, Chair
Zangger Committee and
Director for Non-proliferation, Austrian Federal Chancellery*

The Role of the IAEA in Nuclear Export Controls

Introduction

I am pleased to have been invited to be the first commentary speaker to the keynote presentation of Dr Blix.

The program refers to my function as the current chairman of the Zangger Committee, but I would like to mention that not all what I say will necessarily be shared *in toto* by all members of the Committee. As I am at the same time Director for “nuclear non-proliferation” in the Austrian Federal Chancellery, I may also express thoughts which are of “Austrian origin”, but shared by many colleagues internationally. So please do not mistake my remarks as something that in all detail would necessarily be the opinion of the Zangger Committee.

You have heard from Dr. Blix a general description of the role export controls play in the overall field of nuclear non-proliferation.

It is not my goal today to present the history of the Zangger Committee in detail. There are several publications on this topic. I would recommend to you a paper that was published in the “Non-proliferation Review” bulletin of the Monterey Institute, California in 1994.

In this presentation, I will focus on export controls deriving from the NPT, Art. III. I shall describe how this Article should be seen in the context of verifications: “nuclear material verification” as well as “technology transfer controls”.

I will then elaborate on the different elements in Art. III.2 (export licensing versus transfer controls, “once the item has gone across the border”, some people use the term “multilateral export controls”). I will focus on the NPT Review and Extension Conference 1995 (NPTREC 95), which I consider a landmark also in export controls (request for internationalisation of export controls by some delegations and the response to it). My presentation will conclude with an outlook into the future, in particular regarding the role of the IAEA in export controls on the basis of the Program 93+2 and in connection with the decisions taken in the NPTREC 95: the “enhanced review mechanism” on the basis of “Principles and Objectives”. In this context I will make some remarks about the future role the Zangger Committee (ZAC) can play.

ARTICLE III:

To understand NPT export controls it is necessary to read Art. III in its entirety. There is one message in this article, which I describe as the “universality of Full Scope Safeguards” (FSSG), i.e. to bring all NNWS under the FSSG regime of the IAEA: through Art III.1 those who become Parties to the Treaty, and through Art. III.2 all the others who do not join the Treaty. They shall also be brought to IAEA-FSSG as a condition of supply.

Any other interpretation would simply mean that the drafters of the NPT would have wanted to give a privileged treatment to NPT non-parties, by granting to them cooperation with less severe verification requirements.

Article III.2

The export control article requires, as one can see from the text, that NPT members should only supply nuclear items (especially designed or prepared items) to NNWS if they accept safeguards required by this article. Austria, as a member of the NPT from the beginning, understood the wording “required by this article” as FSSG. There are no other safeguards described in Art. III.

What we can further read from the text is that the Treaty allocates the task of the licensing to the individual state (“each state party” undertakes not to provide) and the task for the verification of the transfer to the IAEA safeguards.

As the items to be subject to export controls were only generally described, it meant that each state party was to find proper answers of how the state would best meet the security objectives inherent in this treaty obligation.

Therefore, it was a rather logic consequence that those countries regularly involved in nuclear supplies would come together to discuss export policies, in order to learn from each other and to harmonise their understandings.

This was the origin of the Zangger Committee, which had its first meeting on 11 March 1971. The Committee established a list of goods, called the Trigger List (any export of such items triggers safeguards) and defined procedures and conditions under which nuclear exports be licensed. These understandings of the ZAC were published in September 1974 as IAEA document INFCIRC/209, and the Trigger List has since then been amended several times.

I will not go into further details here about why the ZAC and the NSG both exist, but there are good reasons for this.

For instance, the ZAC considers itself, and has been considered by the membership of the NPT, as the faithful interpreter of Art. III.2 of the Treaty, as limited as the scope sometimes may have been. The IAEA Program 93+2 may, in this regard, be a further argument for the importance of the Zangger Committee in the future.

We may have time to deal with this important question during this seminar. It is an important question not only for the members of the two groups (NSG/ZAC) but also for the whole membership of the NPT.

Safeguards and Transfer Controls of IAEA

The NPT, Art. III.2 foresees that Parties to the Treaty allow exports of Trigger List items only if they have assured themselves that IAEA safeguards in the recipient country are applied. This makes international verification dependant upon the definition of the framework of IAEA safeguards. In the past, the term “safeguards” was defined in the framework of INFCIRC/153, which only referred to the “verification of declared nuclear material” in NNWS Parties to the Treaty. Dr Blix has referred to it in his keynote speech.

Such a limited interpretation of NPT safeguards made it necessary that the supplier countries themselves had to take full responsibility for exports from their countries. It forced them to develop a concept - and to adapt it according to their needs - a concept of export controls that would hinder the application of supplies to unsafeguarded nuclear activities. The search for clandestine nuclear activities was not yet in the range of IAEA safeguards.

Iraq is the most prominent example of adaptations in the concept of export controls, as it led to the creation, or as some call it “revitalization” of the NSG and in particular toward the expansion of the regime beyond the Trigger List into the area of dual-use items. This will be the theme of session 2.

IAEA involvement in export controls through “93+2”

With the revelations in Iraq came an international awareness about the existence of remarkable limitations in the IAEA’s FSSG system.

Therefore, as was described in the keynote speech, members of the IAEA, being also NPT Parties, launched a program to improve the “comprehensive safeguards system” of the IAEA by expanding the information requirements beyond the current nuclear material declaration. The additional legal instrument for the implementation of that program, called the Additional Protocol, was agreed upon by the Board of Governors in May 1997 and shall serve as a model for the required bilateral agreements with “Comprehensive Safeguards Countries”.

The new information required in the so-called Expanded Declaration from states includes information on exports as well as imports of Trigger List items (according to Art. 2a(ix) of the Additional Protocol - see IAEA document INFCIRC/540). This information will be added to the Agency’s safeguards database about that particular country (“country file”) and will enable the Agency to compare such new information with all information already compiled.

This opens up a new quality of safeguards, because the IAEA can evaluate the importance of e.g. a particular piece of equipment for the nuclear program of that particular recipient country. It will add to the ability of the IAEA to acquire a continuously better insight into the nuclear program of a country. Export reports will create alertness, while import reports will provide confirmation that the transfer has been completed as foreseen.

Non Proliferation Treaty (NPT) - Review & Extension Conference 1995

The NPT Review & Extension Conference 1995 (NPTREC 95) in its decisions - on the last day of the Conference - produced some important elements for our theme of export controls.

One delegation in Main Committee II (Indonesia) introduced the idea of “multilateralisation of export controls”. In the discussions on this proposal it was made clear that the NPT Art. III.2 was clear in determining that “export licensing” is a sovereign obligation of each individual state which must carefully scrutinise all possible proliferation risks before allowing a transfer out of the country.

This sovereignty of course also applies to the right to decide to whom it wants to export. “If I don’t like my neighbour, I will not supply him!” That goes for any item, for fruits as well as for nuclear items.

However, if an export license after careful scrutinisation has been issued, and if the item has gone across the border, it may be understandable that a recipient country would not want the supplier to further interfere into its sovereign national program.

At the same time, it is understood that someone must care for the international security needs implied. It was a logic consequence that such recipient countries would prefer to have an international, independent and impartial organisation that would care for security matters once the item has gone across the border.

What is required for this task?

Answer: “A feasible safeguards system that can handle this area of transfer controls”.

This spoke clearly to the IAEA, as in 1995 its Program 93+2 was under way, and it was particularly observed that the obligation to provide export/import information was contained in the program.

It was therefore no surprise when the 1995 NPT Conference, in its second Decision on Principles and Objectives, stated in the chapter dealing with safeguards, specifically Principle 9 that:

“the IAEA is the competent authority to verify and assure compliance with the safeguards agreements under Art. III”, and “nothing should be done to undermine the authority of the IAEA”.

It further demanded:

“If states have concerns regarding non-compliance by other states, they should direct such concerns, along with supporting evidence and information, to the IAEA to consider, investigate, draw conclusions and decide on necessary actions in accordance with its mandate”.

Principle 12 of the same document stated that:

“new supply arrangements ..should require, as a necessary pre-condition, acceptance of IAEA full scope safeguards..”.

These two Principles, in connection with the Additional Protocol, enforce the role of the IAEA also in the field of verification of peaceful and proper use of transferred Trigger List

items. The only requirement is that the exporting state inform the IAEA of such a transfer and that the importing state confirm the receipt.

Therefore the Additional Protocol has to be seen as a further step in the implementation of the results of the NPTREC 1995, and at the same time it improves the design and in particular the scope of those safeguards, which - in my opinion - the drafters of the NPT had in mind.

To repeat once again, what was said before about the role of the exporting state, according to Art. III.2:

until now the supplier state has two tasks:

task a: to implement the sovereign right to decide upon export licenses and before doing so to make sure that all requirements will be fulfilled in the recipient countries (Government to Government Assurance). The criteria for these requirements are clarified, harmonised and agreed upon in exporters' groups like the NSG and ZAC.

task b: to make sure that the item, once it has gone across the border, will arrive and will be used properly in the recipient country.

While for **task a** the exporters' groups will continue their work in the usual way, e.g. by exchanging information among members, reviewing their criteria and adopting amendments to the Trigger List, etc., **task b** can be handled by the IAEA once the necessary means for implementation are in place. In conclusion, this means that the IAEA will, in the future, have a clear function in export controls once an exported item has gone across the border.

The role of the IAEA will help to lessen the - often politically motivated - tensions between suppliers and recipients who may not tolerate the interference of other states into sovereign national programs of NPT member states.

Although suspicions remain that security considerations may be used as an excuse for commercial interests, countries seem to understand and accept that there is a need to have appropriate security measures in place. They are more willing to accept such security measures if they are implemented by the IAEA, an international, independent and impartial organisation. That was confirmed at the last NPT Conference.

But to enable the IAEA to efficiently fulfill its role, it is necessary that recipient countries adhere to the Additional Protocol. Without this step, the IAEA's role in export controls will always remain deficient and will require exporting countries to maintain their efforts. This would then be the only alternative!

I would like to repeat: FSSG as a condition of supply is a logic pre-condition for the "multilateralisation of export controls" by involving the IAEA in this process and equipping it with the right to acquire full information and access as necessary to obtain full security-relevant insight into the nuclear program of each individual country.

At the same time, we must admit that there is still a lot to do inside the Agency before the Safeguards Department will be able to fully implement the new system. But we can be more and more optimistic - as it was shown in the presentation of Dr. Blix - that the Agency will be

able to take this responsibility for technology transfer controls in the international arena and to implement it.

What remains for the Zangger Committee to do?

The Zangger Committee in cooperation with the NSG (an almost identical list of member countries) will continue to deal with the review of the Trigger List and to harmonise its results as in the past with the NSG. The importance of the ZAC role lies in several facts:

- the ZAC is recognised by the NPT membership as the faithful interpreter of the NPT Art. III.2, as was confirmed by several NPT Review Conferences;
- the ZAC makes the effort to review the Trigger List from time to time as necessary and as the Trigger List has now become an element in the Additional Protocol, this review is even more important;
- NPT members should follow the ZAC understandings when they have a need to fulfil their obligations under Art. III.2;

In this light, the ZAC will have to prepare properly for the NPT Conference 2000 to achieve the same good acceptance by the Conference as it did in 1995.

In concluding, let me once again thank the organisers of this seminar for the invitation. I am grateful that I was invited this seminar to be able - also for the ZAC - to add to one of several opportunities for transparency, as demanded in Principle 17 of the NPT Review and Extension Conference 1995.

Biographical Information:

For over 25 years, Dr Schmidt has been involved in nuclear non-proliferation matters in Austria covering safeguards, export controls, physical protection and illicit trafficking issues. He has the rare distinction of having participated in all NPT Conferences since 1975. Since 1986, he has been the Director for Nuclear Non-Proliferation in the office of the Austria Federal Chancellor. Last, but not least, he became Chair of the Zangger Committee in 1993, in which capacity he was invited to provide the first commentary to this session on the international nuclear non-proliferation regime.

Commentary 2, Session 1

*Dr P. Rama Rao, President
Indian Academy of Sciences and
Chairman, Atomic Energy Regulatory Board, India*

Implementation of Export Control Regimes

Introduction

The following organisations need to reckon with a country's given track record and potential for peaceful development of nuclear energy:

- NPT (reference: Article IV)
- Zangger Committee
- Nuclear Suppliers Group (NSG)
- Wassenaar Arrangement
- National Controls
- IAEA (reference: Program 93+2).

India has indigenised research reactors such as DHRUVA and KAMINI, 220 Mwe PHWR power reactors, and is well on her way to indigenisation of 500 MWe power reactors.

We are not seeking cooperation for research reactors, as we believe we are self-sufficient both in terms of technology and the capital required. We would, however, welcome cooperation in the power programme to speed up expansion in this sector.

The Indian Nuclear Programme has made important contributions in the following areas, which are widely recognised:

- Nuclear Medicine
- Isotope Hydrology
- Nuclear Agriculture
- Pest Control
- Potable Water
- Industrial Applications.

Thus, the Indian public sees our Nuclear Programme as a catalyst for other high technology areas. India's all-around high-tech capability is the foundation upon which a self-reliant nuclear programme can be based. India is a big country with a large base in science and technology, and its drive to self-reliance predates the export control regimes.

India’s Scientific Policy Resolution - 1958

The control regimes have actually served to strengthen the fibre of our self-reliance. That “technology denied is often technology gained” is manifest in the following indigenous developments:

- MOX Fuel
- Carbide Fuel for Fast reactors
- OPRD repair technology
- Coolant Channel replacement.

As a responsible country, we have chosen the hard route of indigenous development, notwithstanding the hurdles we have faced in terms of time, manpower effort and opportunity cost. We shall continue to do so, and there shall be no dilution in our thrust for self-reliance.

Our sense of responsibility is further reflected in the export controls we too have in place. In fact, one of our western friends has called us a “classic non-proliferator”. Below is a chart that compares proliferation behaviour between the United States, the Russian Federation, China and India.

COMPARATIVE NUCLEAR PROLIFERATION LADDER - EXCERPTS

PROLIFERATION BEHAVIOUR	US	RF	Ch	IN
Used nuclear weapons	yes			
Deployed missile based nuclear forces capable of immediate reaction	yes	yes	yes	
Tested at least one n-weapon	yes	yes	yes	yes
Provided another country with n-weapons design information, test data or computer codes, hardware or special nuclear material (SN material)	yes	yes	yes	no
Received n-weapons design information, test data, hardware or SN material			yes	
Supplied n-assistance to unsafeguarded facility	yes	yes	yes	
Indigenously produced ballistic missiles	yes	yes	yes	yes
Violated non-proliferation commitments given to several US presidents			yes	
Number of yes evaluations	13	16	16	10
Subjective evaluation of the degree of restraint taking into account temporal factors and unique national circumstances	medium	medium to high	low	medium to high

Source: Dr. Thomas Graham, Rockefeller Foundation

The appellation of “classic non-proliferator” is reinforced when taking into account the various factors listed above.

India's Nuclear Programme

India has chosen the closed fuel cycle, which we see as the path to sustainable development. We have developed comprehensive capabilities across the entire fuel cycle and all sectors of the nuclear programme including:

- Prospecting, mining, fuel fabrication
- Nuclear power, including breeder reactor development
- Reprocessing
- Waste Management
- Electronics and Control Systems
- Accelerators and Lasers
- Radioisotope production
- Basic and applied research including fusion.

Reprocessing is important for separating Pu-239 and U-233. India has now built its third and largest processing plant at Kalpakkam, which is currently under regulatory inspection. Reprocessing and recycling of fissile material is often regarded as a proliferation concern. However, this denies the benefits of two orders of magnitude of additional energy that most of the world desperately needs. Reprocessing, while realising higher energy potential, simultaneously offers a sound solution to long-term waste safety and adequate proliferation resistance.

Statute of the IAEA

India sees the following statutes of the IAEA as extremely important:

Safety Convention:

- Safety-related equipment
- Research & Development in safety
- Exchange of information on safety.

Agenda 21:

- Recognition of the need for global partnership.

With these important statutes in mind, we pose the question that surely export controls are not to prevent the proliferation of nuclear power?

Future Energy Implications

Below is a chart indicating the increase in the importance of nuclear energy for the future.

PRIMARY ENERGY SUPPLY IN 1995 AND PROJECTED PRIMARY ENERGY SUPPLY IN 2050 (TO RETAIN CO₂ EMISSIONS AT 1995 LEVEL)

	1995	2050	Total Energy (%)
Coal	2.2	1.0	26 - 6
Oil	3.2	3.2	37 - 19
Natural Gas	1.9	3.8	22 - 22
Nuclear	0.6	2.9	7 - 14
Renewables	0.7	6.8	8 - 40

all units in Gigawatt tonne Oil Equivalent (Gtoe)

Source: Gerald Clark, Secretary General, Uranium Institute

As one can see, nuclear energy will expand from being approximately 7% of the world's primary energy supply to 14%. This will be, in fact, necessary in order to preserve CO₂ Emissions at the 1995 level. Hampering growth in nuclear power is equivalent to damage to the environment in the long run.

Commercial Potential of Nuclear Power in India

The estimated nuclear power generation capacity of India for the year 2020 is 20,000 Mwe. This is based on self-created technology (PHWRs, FBRs and Thorium- U-233 cycle) and LWR imports from friendly countries interested in the development of LWR technology.

Ultimately, the per capita consumption of electricity in India should increase by a factor of 8-10 in order for India to attain the quality of life in developed countries. We are thus talking about 1,000,000 MWe at some point of time - even 10% of this is 100,000 Mwe nuclear capacity.

With these conclusions in mind, the Indian nuclear industry presents a big commercial market for nuclear power in the next two decades.

Biographical Information:

Dr P. Rama Rao is a Physical Metallurgist and Past President of the Indian Institute of Metals and a recipient of its highest honour, the Platinum Medal. He is currently the Chairman of the Indian Atomic Energy Regulatory Board. He is a Fellow and currently the President of the Indian Academy of Sciences. He is a Foreign Member of the Royal Academy of Engineering, UK, and a Past President of the International Congress on Fracture.

Keynote Speech, Session 2

*Mr Carlton E. Thorne
Former Chair of NSG Working Group
which created the Dual-Use Regime*

Multilateral Nuclear Export Controls: Past, Present and Future

Introduction

One approach to describing multilateral nuclear export controls is to do it according to time. This leads to an interesting discovery. You will find that multilateral nuclear export controls have been defined by four distinct periods, the first two of about five years each and the second two about twice as long. These time periods have another interesting characteristic. The two suppliers groups which we will discuss in detail have alternated in dominance over these nearly thirty years.

After the walk through time, the status of the present situation in multilateral nuclear export controls, the strengths and the weaknesses, will be examined.

And finally, a look at the future of multilateral nuclear export controls and possible paths that might be taken.

Policies and Principles

Before discussing the historical developments which have defined the present situation, let us first consider the underlying policies and principles which are the driving forces behind nuclear export controls.

The Nuclear Suppliers Group (NSG) and the NPT Exporters Committee (Zangger Committee) are the two arrangements that administer multilateral nuclear export controls. Both arrangements are informal and are not legally binding on the part of the members. They do, however, represent a policy commitment on the part of the participating governments.

As informal arrangements, either one is free to define the scope of its activities. In the case of the NPT Exporters Committee, the members have chosen to limit its mandate to interpreting the meaning of Article 3.2 of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT). The NSG, on the other hand, has demonstrated flexibility by successively broadening its mandate beyond the limits of Article 3.2 to include such areas as physical security standards, and dual-use and technology controls. The principal point, however, is that by virtue of being informal arrangements, either is free to act as it sees fit on the basis of consensus decisions.

A second characteristic of multilateral nuclear export controls is that they have no single orientation. They are neither trade promoters, nor are they devoted to trade restrictions. In

every decision taken there is a conscious effort to be balanced between these often times competing interests. Multilateral nuclear export controls of today are far from being like the Coordinating Committee on Multilateral Export Controls (COCOM) controls implemented by the West during the Cold War. Clearly COCOM was specifically designed to be a trade restrictive arrangement.

The next characteristic of the supplier arrangements is very important especially for non-members to understand. The NSG and the Zangger Committee do not deny exports and neither do they approve exports. Any denials of license applications by member states is either based on their individual unilateral controls or on the basis of common conditions of supply and principles voluntarily agreed to in multilateral arrangements. Again using COCOM to illustrate this point. When a member of COCOM requested an exception to the embargo for a particular transfer, the request could be vetoed by any other member. In the case of COCOM it was clearly the action of the group which led to denials and approvals.

The nuclear suppliers arrangements are not intended to be adversarial. They establish a norm of conduct for suppliers made up of conditions of supply and principles which should prevent the transfer of nuclear and nuclear related commodities and technologies to certain end-uses and end-users. There is no provision in either arrangement that is punitive or restrictive in non-nuclear activities.

Finally, a timely characteristic of the nuclear suppliers arrangements is their transparency. There are no secret agreements. There are no secret lists of “bad guy” countries. With regard to this last point, it should be said that the members of the arrangements are so sensitive to the creation of lists that they have even shied away from naming countries with good non-proliferation credentials. Other multilateral export control arrangements cannot claim the same degree of transparency.

To aid in this transparency, the International Atomic Energy Agency (IAEA) has assisted supplier states in publicizing the supplier arrangements. The Agency publishes the NSG Guidelines and Trigger List in Information Circular (INFCIRC)/254 and the Zangger Understandings and Trigger List in INFCIRC/209.

The confidentiality of certain aspects of the arrangements is required. For example, it would be counterproductive to publish the dual-use denial notifications since it would alert the proscribed end-user of the need to be more deceptive. The fact that the NSG has a denial notification procedure is not confidential and is contained in the Memorandum of Understanding (MOU). The MOU was not published in INFCIRC/254 because it was only relevant to the Subscribing Governments to the Dual-Use Arrangement. At the 1997 Plenary in Ottawa, it was confirmed that the MOU is not a confidential document and can be made available to anyone.

The Zangger Committee Period from 1970 to 1975

From 1970, the year that the NPT came into force until the nuclear explosion by India in 1974, multilateral nuclear export control policy was defined by Article 3.2 of the NPT and clarified by the NPT Exporters Committee. It was a time of relative quiet and equally little progress in strengthening nuclear export controls.

Export controls in the NPT are no different today than they were in 1970. The NPT does not require fullscope safeguards as a condition of supply. However inconsistent this may seem for parties to the Treaty that accepted fullscope safeguards for themselves (except for the nuclear weapons states), it is true. No matter how many supplier states adopt such a policy either in the context of the Nuclear Suppliers Group, or in any other forum, the lack of a legally binding commitment in the NPT is still there.

The NPT still does not control nuclear technology. Whereas the export of a nuclear reactor would fall within the purview of the NPT, the design information explaining how to build such a reactor would not be controlled by Article 3.2.

The NPT with respect to nuclear export controls 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.

Today there are more than five states believed to have nuclear weapons, or at a minimum, capable of producing nuclear weapons. Moreover, a non-nuclear weapons state doesn't require know-how from a declared nuclear weapons state in order to be able to create a nuclear weapons program. There are many items of equipment and materials available from non-nuclear weapons states that are of direct use in a nuclear weapons program. Unfortunately most of these items have other legitimate non-nuclear uses, thus making effective controls difficult.

The export control provisions of the NPT have not been changed to reflect the realities of today's world. The fire break at special fissionable material has long since been overcome and the Treaty does not control items for weaponization.

The purpose of this paper is not to argue for NPT amendments. There is a great reluctance to opening any existing treaty for amendment. Therefore, if deficiencies can be eliminated by alternative means then this is preferable to amending a treaty. As we will discover later, many of the export control deficiencies of the NPT have been addressed by the NSG, and resolved.

The NPT Exporters Committee, chaired by Claude Zangger, was formed soon after the NPT came into force. This Committee, called the Zangger Committee in honor of the Chairman, undertook to interpret Article 3.2 and in particular, what was meant by "especially designed or prepared equipment or material for the processing, use or production of special fissionable material". Please note the word "or" in "especially designed or prepared". A common mistake is for persons to say "especially designed and prepared". You only have to consider the logic of the two words to recognize the significant difference that one small word makes.

The state of the Zangger Committee's Trigger List ("triggers" safeguards as a condition of supply) as it was originally created, lacked specificity. It only listed the plants for each step of the fuel-cycle (excluding mining and milling, conversion and heavy water production), and EDP equipment therefor (with no identification of the equipment itself).

The point to be made about the period from 1970 to 1975 is that the NPT as the lone mechanism for nuclear export controls had, and still has, many deficiencies. Still it should also be said that even with the deficiencies just mentioned, the NPT provided a solid

foundation for multilateral nuclear export control regimes to build upon. Today the NPT with its 185 parties is close to being the universal treaty that so many have worked for.

The Nuclear Suppliers Group Period from 1975 to 1980

The next time period for nuclear export controls is from 1975 to 1980. This time period is marked by the initiation of nuclear export control talks in London by seven countries (Canada, France, United Kingdom, United States, Soviet Union, the FRG and Japan) as a show of concern for the nuclear explosion which had occurred in India.

This Group offered a much better avenue for nuclear export control reform than the Zangger Committee for at least two reasons. It would not be constrained by the limitations of Article 3.2 and it would be aided by the presence of Japan and France, non-NPT parties at the time.

After a series of meetings in 1975 in London, the London Club as it became known, had reached *ad ref* agreement on what was to be published in January 1978 as INFCIRC/254 by the IAEA as the Nuclear Suppliers Guidelines.

The results, while always cast in the best light, were far from being all that they could be. This is not to say that improvements in multilateral nuclear export controls were not made. One accomplishment was the addition of heavy water plants and equipment to a Trigger List which otherwise was identical to the Zangger list. Another addition was a section on physical protection. And finally, technology was mentioned in the context of exercising restraint in the transfer of sensitive technologies and in the replication of facilities using transferred equipment.

The negotiating record however, shows that this small elite group of countries which met regularly over a period of two to three years fell far short in many areas.

Fullscope safeguards as a condition of supply was favored by some of the participants, but others would not support the proposal so nothing in this area was achieved. Evidence of this losing battle still remain in the NSG Guidelines. Paragraph 5 contains the original language, which says, "Suppliers will jointly reconsider their common safeguards requirements, whenever appropriate". The advocates of fullscope safeguards as a condition of supply held out the hope that they could still convince the opposition. This paragraph as it was first drafted called for a reconsideration of the safeguards requirements by the end of 1976. This of course did not happen, and while the basic thought survived, references to any particular time for reconsideration were deleted.

There were other compromises in the original Nuclear Suppliers Guidelines as well. In paragraph 7, it says that suppliers should encourage recipients to accept, as an alternative to national reprocessing and enrichment plants, supplier involvement in appropriate multinational facilities. In the negotiations the point of disagreement was over whether to "require" or to "encourage" recipients to accept supplier involvement. As can be seen, the weaker position won.

A final example of compromise is in paragraph 9 of the Guidelines. It calls for suppliers to endeavour to obtain agreement from the recipient for consent rights over any weapons usable materials derived from the transfer. Here again the negotiations centered on whether to use

“endeavour” or the word “require”. Again there was no consensus for the stronger language and so the weaker language won.

These points are never used in criticism of the original guidelines. What is heard most often of a critical nature is that once the Guidelines were published, the adherents to the Guidelines failed to meet for over 13 years. This may appeal to those who measure success by the number of meetings attended, but in the case of the adherents to the Nuclear Suppliers Guidelines it provides little basis for criticism. To the contrary, the Guidelines were not forgotten, nor were they dormant. Over that period of time the number of adherents increased from 15 to 27. In retrospect it is unlikely that consensus on any major improvement, such as fullscope safeguards, would have been possible and therefore an active Nuclear Suppliers Group would have only solidified its earlier shortcomings.

The Zangger Committee Period from 1980 to 1990

This takes us now to the next period which covers the years after the publication of the Nuclear Suppliers Guidelines until the events leading up to the meeting of the adherents to the Guidelines in The Hague in 1991. This was a very positive period for nuclear export controls. As just mentioned the number of adherents to the Nuclear Suppliers Guidelines nearly doubled. But more importantly it was a time of renewed vigor in the Zangger Committee. Under the leadership of the United Kingdom a major initiative to clarify the gas centrifuge enrichment entry was begun and was successfully completed in 1984. Following the pattern of work established by the U.K., a second upgrade exercise was led by the United States for the reprocessing entry and completed in 1985. And in 1990 the Trigger List entry for gaseous diffusion was clarified following an extended effort led by the USSR. Although not finalized until 1992, the Canadian led exercise to upgrade the heavy water production completed the informal work plan of the Committee which had begun with the U.K. in 1981.

The upgrade exercises which added large numbers of EDP equipment to the Trigger List were the visible results of the Zangger Committee. While not apparent to persons outside the Committee and working group meetings, an important characteristic of the period was the spirit of cooperation between East and West in nuclear non-proliferation in general, and in nuclear export controls in particular. To a great extent the successes of the Nuclear Suppliers Group since 1991 may be due to the relationships and spirit of cooperation that were established in the technical consultations of the relatively non-controversial upgrade exercises.

The Nuclear Suppliers Group Period from 1990 to the Present

This brings us to the next period which is characterized by the revitalization of the Nuclear Suppliers Group and which began in a formal way with the meeting of 26 adherent countries in The Hague in 1991.

One reason the adherents of the Nuclear Suppliers Guidelines did not meet for more than a decade was the general belief that such a meeting of the “London Club” would cause widespread criticism. The Netherlands is to be commended for calling the meeting in early 1991 of the adherents. It was careful to refer to the meeting as a meeting of adherents and not to infer that it was a “club”. For nearly half of the attendees it was their first meeting since becoming an adherent to the Guidelines.

At this point it is worthwhile to point out that membership did not become a recognized concept until about 1993. And then it was more a matter of “happening” as opposed to being consciously created. Today, “adherent” is the status of a country which has informed the Director General of the IAEA of its intention to abide by either the NSG Guidelines or the Zangger Understanding and asks that he inform the Agency members of this decision. Membership in either arrangement is a status that can only be attained by consensus of the existing members in each arrangement.

The United States in particular welcomed the Dutch initiative. Since 1978 when the far sweeping Non-Proliferation Act (NNPA) mandated controls on dual-use equipment and materials, the U.S. had sought to convince other suppliers of the need to control these commodities.

Throughout the 1980s, more and more suppliers came to appreciate this gap in nuclear export controls. As pointed out in the discussion of the NPT, there were no international controls on equipment and materials used in the development, production and testing of nuclear weapons. Moreover, during the upgrade exercises conducted on the Trigger List there were many items identified which were dual-use and not acceptable for inclusion on the EDP list. These items were called “second track” and the record of the meetings urged suppliers to make best efforts to control these items. This was, of course, an ineffective approach.

In mid-1990, the U.S. departed from the previous approach of only raising awareness to the dual-use problem and started serious talks to examine the possibility of a multilateral arrangement. In January of 1991, a U.S. delegation was on a trip through Western Europe soliciting support. Earlier meetings had been held in Washington with other key suppliers. After successful meetings in London, Paris, Bonn, and Brussels the delegation had flown to Stockholm and completed a day of discussions there from which they were to fly to Rome the following morning. The plans were interrupted that night by the beginning of the Gulf War. Instead of flying to Rome the delegation returned to Washington. Consultations through diplomatic channels continued and on February 21, 1991, I chaired an informal meeting of the 26 adhering countries in The Hague to solidify support for the creation of a working group to address dual-use controls at the upcoming meeting called by the Dutch and to introduce them to working drafts of the guidelines and list. Contrary to some accounts, the dual-use problem was not suddenly discovered and reacted to as a result of Iraqi actions. It is fair to give the War much of the credit for giving the initiative the support needed to reach early agreement.

By bringing the suppliers together from East and West in The Hague in early 1991, not only was there a forum to make progress in dual-use controls, but also to seek in the near term the elusive fullscope safeguards condition of supply.

The Hague meeting resulted in the establishment of the Dual-Use Working Group to be chaired by the U.S. to examine the feasibility of a dual-use export control arrangement. Also agreed was for Finland to take the lead in harmonizing the NSG Trigger List with that of the Zangger Committee which as mentioned above had undergone extensive changes.

Work began immediately for the Dual-Use Working Group. I was given the job of chairing the Group by Ambassador Richard Kennedy, the Ambassador-at-Large for nuclear affairs for the United States. This began a series of four week-long meetings over the next nine months in The Hague, Brussels, Annapolis and culminating with the final meeting at Interlocken in

January of 1992. At the end of that final meeting there was agreement on the Dual-Use Guidelines and a Memorandum of Understanding, both it should be noted have remained unchanged to this date, and an Annex of equipment, materials and related technology covering about 65 commodities. This list has undergone one complete review and revision since it was created but still retains much of its original content.

When the NSG Plenary opened in Warsaw just over two months later there was nothing left to do with respect to dual-use controls except to adopt the Working Group report.

Parallel with the dual-use negotiations were efforts to bring closure on the issue of fullscope safeguards as a condition of supply. During the course of 1991 more countries had announced the adoption of this policy. Those who had not yet adopted such a policy were alerted to the need to have approval from their capitals to adopt a common policy at the Warsaw meeting.

The dynamics of how the present policy statement in the NSG Guidelines came to be would be worth a case study in multilateral diplomacy alone. Most countries with the fullscope safeguards policy were similar to the United States. It consisted only in a general statement that we would require fullscope safeguards on any significant new supplier arrangement. Neither “fullscope safeguards”, nor “new” nor “significant” were defined. As a matter of law we required *de facto* fullscope safeguards, i.e., all activities must be under IAEA safeguards at the time of export. As an aside the parallel today is catch-all controls. Many states have catch-all controls but they may not all mean the same. This was the case for fullscope safeguards policies by the NSG states. At the Warsaw meeting however, the states had to put into writing what fullscope safeguards meant. What came out of the negotiations exceeded all expectations. In 1975 the seven states of the London Club were not able to agree on fullscope safeguards as a condition of supply for anything, not even the transfer of a complete enrichment plant. Now in 1992 there was agreement that the policy applied to every item, big or small, sensitive or non-sensitive, covered by the Trigger List.

Not to let the moment pass by referring to capitals for approval of a change to the Guidelines, the delegates decided to adopt a declaration at the Warsaw meeting. Only one delegation was without instructions to sign at the meeting, but did so at a later date. The following year in Lucern the Guidelines were amended to reflect the policy of the Declaration.

For two such momentous changes to occur in the international export controls at one meeting is even now difficult to believe. The momentum, however, did not end there, nor did the effects of the dual-use arrangement.

The Dual-Use Guidelines contained controls on the technology for the development, production and use of every item of equipment or material. These comprehensive technology controls stood in stark contrast to the Trigger List controls which only covered the equipment and material. It created the ridiculous situation of applying export controls in Part 2 on the technology to produce and use a remote manipulator, for example, but in Part 1 of the Guidelines there were no controls on how to build an operational reprocessing plant. At the 1995 NSG Plenary this difference was ended with the amendment of the Guidelines to include technology controls on every item of the Trigger List. This made the technology controls of Part 1 identical to those of the Dual-Use Arrangement.

The Dual-Use Guidelines were leaders in another way as well. In the Basic Principle of the Dual-Use Guidelines is contained a subjective reason for denial which says that a supplier should not transfer any item on the Annex if it would be contrary to the objectives of nonproliferation. The Guidelines covering the Trigger List, on the other hand, were totally objective. Whether or not the recipient country had a fullscope safeguards agreement in force with the IAEA was the only criterion for approval or denial. At the 1994 NSG Plenary in Madrid, a nonproliferation principle was added to the Part 1 Guidelines.

These and other improvements in the NSG Guidelines have been quietly made in the 1990s. Many of them would have been seen in the other eras of the nuclear export control history as of great significance. For example, an NSG Technical Working Group, led by Jim Casterton of Canada completed a comprehensive overhaul of the enrichment technology entries of the Trigger List in 1994 which added extensive lists of equipment to the Trigger List and added entire enrichment technologies not previously included. More recently, a technology holders working group led by Richard Goorevich of the United States completed the first review of the non-sensitive technologies. This review, the first since the Zangger Trigger List was published in 1974, resulted in amendments and clarifications to the Trigger Lists of the NSG and the Zangger Committee.

Present Status

So here we are today on the threshold of a new century. What are the strengths of the present nuclear export controls? What are the weaknesses?

There are many positive aspects of the present situation. Membership in the Nuclear Suppliers Group is now at 34 with Latvia soon to become the 35th member. Thirty-two of the NSG members also make up the membership of the Zangger Committee.

There is no major export control need that is yet to be met such as there was in previous eras with respect to fullscope safeguards and dual-use controls.

There is harmony within the NSG and the Zangger Committee memberships. No member has failed to live up to its commitments. There have not been any accusations of one country taking unfair commercial advantage over another.

Information sharing has never been better. A special session at each NSG Plenary is devoted to the sharing of a wide range of information of relevance to the members. Most recently the NSG acting on the recommendation of the Information Sharing Working Group led by Trisha Dedik of the United States adopted a computerized information sharing system to supplement the diplomatic channels. This system has already been installed in almost all member states.

There is also a new awareness of the need to be sensitive to the views and perceptions of non-NSG members. The decision to present a Transparency Seminar in October 1997 is evidence of this new awareness.

The multilateral export control arrangements are also believed to be effective in meeting their objectives. Effectiveness, of course, is difficult to measure. Even in the best of circumstances export controls alone cannot prevent proliferation. Export controls can delay proscribed activities in order to allow other means, such as diplomacy, to help. Export controls can also

cause the end-user to choose a less capable and often times more costly option. Not to be ignored is the value of a group of countries taking a principled position on the critical matter of nuclear proliferation. On some issues, in addition to winning and losing, taking a principled stand is an important part of the equation.

Fortunately there are no major flaws which are in urgent need of attention in multilateral nuclear export controls. There are, however, some bothersome trends which need to be considered. In the not too distant future there are questions that will need to be answered.

One trend of concern is the decreasing experience level of persons involved in the multilateral nuclear export control process. It is not unexpected that a turnover in member state staff working these issues will occur on a regular basis, but there has been little evidence of new persons stepping in and making an informed contribution to the proceedings.

Closely related to the previous trend is a trend toward more persons at the meetings without a direct interest or knowledge in nuclear matters. It seems that more and more of the delegation members today are either involved in the administrative side of export controls, or are involved in all of the other supplier arrangements, be they nuclear or otherwise.

There is also a concern with respect to the NSG that its annual plenary is becoming too grand and too costly to be sustained. The Members which have hosted the plenaries have done an outstanding job of providing the facilities and services for effective meetings. Many of the Member States, however, would not be able to bear the large cost associated with a plenary meeting, nor would have sufficiently large facilities. Perhaps this will not be a problem for the next two or three years, but at some time it will.

Questions Which Shape the Future

The future of multilateral nuclear export controls will be shaped by the answers to many questions. It is the answers to the following questions, however, which require early resolution:

1. How do you reconcile the desirability of having all countries who have the ability to export items on the NSG Part 1 and Part 2 lists adhere to the Guidelines, while at the same time keeping the membership at manageable numbers?
2. What is the future of the Zangger Committee? Can it coexist with the NSG? If so, how? Should it be maintained or dissolved?

On the question of adherents and members, this has long been recognized as an evolving problem that one day would have to be addressed.

Most countries in today's world are able to produce one or more items from the Trigger List or the Dual-Use List. At a minimum, any country which has a machine tool shop could be the supplier of especially designed or prepared components from the Trigger List. How many controlled items a country produces should not be given too high a priority when measuring the importance of a country as a supplier. It is in the interest of all supplier states of the NSG to have all other supplier states adhere to the Guidelines regardless of how many items they

produce. Adherence to the Guidelines is also of value in the case of countries located on transit routes for controlled commodities or are possible diversionary routes.

There is little incentive for a country to adhere to the Guidelines, but not seek to become a member of the NSG. Why follow the rules of the NSG and not be allowed to join in the decisions which affect their export controls? It is also going to be increasingly difficult for adherents to be accepted into membership by the required consensus. It is hard to imagine an NSG with over 40 members able to function efficiently and effectively, not to mention the problems of trying to fit such a large group into a meeting room. The excellent facilities provided by the Mission of Japan in Vienna when they became Point of Contact in 1991 have already become overburdened by the frequent working group meetings and the Dual-Use Consultations held there every October. Already the Government of Japan is considering a move to larger quarters. Thus far the issue of adherents and members has not been addressed, perhaps because there is no obvious or easy solution.

The question of the future of the Zangger Committee is another one which should be addressed.

When persons are introduced to multilateral export controls, the question most often asked, after both the NSG and Zangger Committee are described, is, "Why have the Zangger Committee?"

The answer given is that the Zangger Committee has a link, albeit informal, to the NPT where its mandate is to interpret the meaning of "especially designed or prepared" in the context of Article 3.2. This link, so goes the argument, establishes the Zangger Committee as the export control arrangement representing the 185 parties to the NPT. Further, the argument goes, the NSG is an informal arrangement with ties only to its membership. This implies that because of the linkage to the NPT that it would be desirable for the NPT parties to adhere to the Zangger Understandings. But this comes into conflict with the NSG adherent/membership problem just discussed. If there is an initiative to gain wider adherence to multilateral nuclear export controls, that effort should be directed to gaining adherence to the one which includes fullscope safeguards as a condition of supply, technology controls, and dual-use controls. That is the NSG.

The Zangger Committee has some positive organizational and procedural characteristics which need to be factored into the discussion. It meets twice a year, in May and October, in half-day meetings at facilities provided by the Government of Austria. Most of the work of the Committee takes place in smaller technical meetings which meet at various locations in Member States during the year. It conducts its business with a minimum of formality.

It is chaired by a chairman with unlimited tenure, currently Fritz Schmidt of Austria. He is only the third chair in the long history of the Committee. It should be noted that Dr. Schmidt brings an added positive dimension to a discussion of the Committee because of his long experience which goes back to the beginnings of the multilateral nuclear controls. The Secretariat function is provided by the United Kingdom Mission in Vienna, a service it has provided in an outstanding manner since the Committee was created.

Delegations to the Zangger Committee meetings, while many of whom overlap in participation with the NSG meetings, tend to have a stronger nuclear orientation.

There are two directions for the Zangger Committee, which would be detrimental for the Committee. First, if the Zangger Committee tries to be “just like” the NSG, its existence will be more difficult to justify.

Secondly, if the Zangger Committee becomes the alternative to the more comprehensive controls of the NSG for NPT parties to adhere to, then this might cause the Committee to come under attack.

This leads to the obvious conclusion, that if the Zangger Committee is to survive it must have a role which complements the NSG, and not be in competition, or be seen as a nonproliferation liability or being an avenue for unfair commercial advantage.

The Future

The shape of multilateral nuclear export controls in the future will be the result of much more thought and hard work than is contained in this short treatise. Resolution of the questions just discussed, however, will have to be a part of any direction taken.

One approach which offers the possibility of addressing the issues raised would have the following characteristics:

The Zangger Committee would become the standing technical working group of the NSG. The Zangger Committee would be responsible for maintaining the control lists of Parts 1 and 2 and for reviewing any proposals from the supplier states on additions, modifications or deletions to the lists.

Under this path the NSG Plenary would begin a priority effort leading ultimately to the elimination of the distinction between adherent and member.

The first step in this direction would be to “clean up” the Part 1 Guidelines. There remain a lot of superfluous relics of the pre-fullscope safeguards era which should be deleted for the sake of clarity to adherents and non-adherents. The elimination of the physical security annex would also be a part of the clean-up. Other fora adequately cover this important matter.

The Trigger List should likewise be given a thorough review to ensure that all open technical issues have been addressed. With the recent amendments to the reactor, fuel fabrication and heavy water production entries, the only issue currently on the table is the conversion technology upgrade proposal. The effort to “certify” the up to date completeness of the Trigger List could be assigned to the Zangger Committee in anticipation of the future melding of the two groups.

The next step is the more difficult and one which will need to be carefully thought through to guard against unanticipated consequences. This step requires the integration of the Guidelines of Part 2 and the Memorandum of Understanding.

The consolidated Part 2 Guidelines would eliminate the status of “Subscribing Government”. In the process of revising the denial notification process, it will be necessary to give the notifying country the option of whether or not to send it to all countries. The revised denial

notification process will likewise have to become a bilateral notification as opposed to the current transmission by the Point of Contact to all Subscribing Governments.

With the results of these steps in place the NSG can eliminate the category of participation called “membership”. The situation will revert to that of the time period from 1978 to the situation faced by the Dutch in 1991. Then the NSG was defined by all countries which had notified the Director General of their adherence to the Guidelines and an addendum had been published to INFCIRC/254 indicating this adherence.

It should be clear that one of the motivations for the thorough review of the Nuclear Suppliers Guidelines is to reach a point where the supplier countries can be reasonably confident that the Guidelines and control lists can be left alone for an extended period of time. It anticipates a time in which participation in the NSG will be the decision of an individual country, not a group. It also anticipates the inherent difficulty of reaching a consensus with many more countries involved.

Realistically, the first meeting of adherents under the new guidelines would probably not be possible before the year 2000.

Beginning in 1998 and continuing in subsequent years, regional meetings of adherents to the NSG should be held to discuss supplier related issues and to invite non-adherent countries of the region to attend as observers. These meetings would give transparency to the NSG Guidelines and would provide an opportunity to increase the number of adherents.

At such time as the number of adherents at the annual plenary meeting becomes too great, consideration can be given to relying solely on the annual regional meetings with occasional meetings of the regional representatives, the Zangger Chair and the Point of Contact. At the time of elimination of the annual plenary, the issue of the chair would have to be addressed.

Another possible path for the future could be the creation of a “super” export control arrangement that combines the existing multilateral export control arrangements. There are many supporters of this approach in the international community. It is especially appealing to the smaller countries where a small cadre of officials must administer all of the arrangements and attend all of the meetings.

Under this approach, the problem of adherent and member discussed in the previous approach is not resolved. In fact the problem may be exacerbated.

The “super” arrangement, however, could offer a solution to the NSG/Zangger Committee issue. Under this approach it is presumed that standing working groups would be established to represent the nuclear, chemical/biological, missile and conventional arms interests of the larger group. If the NSG became the group of nuclear specialists for the “super” arrangement, then the Zangger Committee, continuing its link to the NPT, could become a forum to look more broadly at nuclear supplier issues related to the Treaty. It would cease to be considered an export control arrangement, a new mandate would be developed, new understandings drafted and the Trigger List would be deleted.

The approaches just outlined are two of many. The primary objective is to stimulate thinking about the future. Whether the multilateral arrangement in place when viewed in the

beginning of the next century resembles one of these approaches is not so important as whether it solves the issue of gaining wider adherence by additional countries to the norm of conduct contained in the NSG Guidelines. Supplier states have risen to the challenges in the past. The only uncertainty is in how the challenges will be met, not if.

Biographical Information:

Mr Carl Thorne brings with him over thirty years experience in the nuclear-related fields including command of ten nuclear equipped intercontinental missiles while serving as an officer in the U.S. Air Force. He worked in the U.S. Department of State from 1986 - 1993. He was responsible for administering the U.S. nuclear export control system and was the U.S. Representative to the Zangger Committee. Carl Thorne chaired the Working Group which created the NSG's Dual-Use Arrangement. Since 1993 he works as an independent Consultant.



Commentary 1, Session 2

***H.E. Ambassador M.S. Ayatollahi , Resident Representative
of the Islamic Republic of Iran to the IAEA***

It's a privilege for me today to be able to offer some remarks to the Seminar on the very interesting and informative statement made by Mr. Thorne, a pioneer in the Dual-Use Export Control Regime in nuclear business. Remarks that I make here may either look primitive to the experts who have devoted a lot of energy in such export control arrangements or may simply be inaccurate, in which case in the light of information I will receive during the course of this seminar, shall hopefully be corrected.

It should be borne in mind that these comments do not necessarily reflect the formal position of my government. They are from the top of the heads of typical concerned groups within developing nations.

I am obliged to express my appreciation to the timely decision of the NSG in responding appropriately to the call of many states signatories to the NPT in its historical review and extension conference in 1995 at the UN Headquarters in New York and the preparatory Committee thereafter. This is the first important but exemplar measure taken by the NSG that gives a hopeful outlook for more periodical seminars which can provide international transparency for nuclear export control arrangements.

I wish to directly touch upon the substance of the statement by Mr. Carl Thorne through the following remarks:

1) It is well understood and taken for granted that the NSG and its sister committee (Zangger Committee), as the two arrangements to administer international nuclear export controls are informal and not legally binding on the part of the members. They do however represent a policy commitment on the part of the participating governments.

From the point of view of the NPT signatories among recipient countries who have committed themselves to the letter and spirit of NPT as a strong and almost universal legally binding international instrument, it is rather hard to digest that in addition to the Full-Scope Safeguard (FSS) agreement and the vigorous inspection commitments, the fate of their national developments through application of nuclear energy for peaceful purposes lies somewhere in the hands of an informal group. This group is composed of exporter states that are holding an arrangement which is neither a trade promoter nor expected to be a trade restrictor.

These two arrangements (NSG and the Zangger Committee) are not supposed to deny exports nor to approve them. That is a decision left at the mercy of the governmental authorities. The question is, why are these two arrangements so important and what makes their functions so crucial? Certainly the guidelines and recommendations of these arrangements provide frames of reference for the authorities to decide on the approval or denial of export licenses.

If such is the only criteria which is deemed to be mainly based on technical considerations, it can be somehow justified. The NSG argument to the NPT signatories is then that these

informal control arrangements are simply precautionary measures voluntarily taken by exporters to respond to Articles I and II of the NPT. Of course, the next question will be that there is also a very strong Article IV of the same NPT that assures that there should not be any impedance in the way of nuclear material and technology transfer for peaceful applications in developing countries. This in itself calls for elaborate discussions and evidences on the part of NSG to show that the arrangements comply fully with Article IV.

But, if such technical criteria is not considered by national authorities of exporter countries; and instead other selective criteria, be it political or otherwise, are considered for decision making on license approval, then the efforts of the NSG in providing technical guidelines and genuinely watching against potential proliferators will be futile. The political decision by itself is strong enough to decide on approvals and denials. Under such circumstances the economic development of recipient countries will be severely hampered due to insecurity of nuclear supply.

2) The measures taken by the IAEA in publicizing the supplier arrangements is indeed a valuable initiative towards transparency of the NSG control regime. The NSG Guidelines and Trigger List have appeared in the Agency's INFCIRC/254 and INFCIRC/209. However, as we expressed this in the early nineties it would have been more appropriate that the Agency formally prepares such lists independently and checks it against those prepared by such informal arrangements. In that case these lists would become official and legally binding documents for the Agency's future safeguard operations.

3) It is true that the export control provisions of the NPT date back to the early seventies. One may argue that any reference of the NPT to the export control could not go beyond the technology of those days. This has provided a basis for the NSG to claim the need for a progressive and updated control system and Guidelines. On the contrary one might also go to the extreme by claiming that the NPT provisions should be replaced by informal export control arrangements. However, the Treaty of Nuclear Non-proliferation is not supposed to go into details that are subject to change with time, but it rather sets a strong framework for international nuclear non-proliferation. Technology development together with new international instruments will appropriately fill the gap and take care of the deficiencies.

4) According to Mr. Thorne, contrary to certain beliefs, the issue of Dual-Use nuclear equipment did not surface as a surprise and was not reacted to as a result of Iraqi actions during the Gulf War (Properly put: War in the Persian Gulf). Although it is true that the war unfolded a major clandestine operation, the question remains as to how all of the equipment for such operations had been supplied during a few years. It may be easy to traffic illicitly a few pieces of equipment without the knowledge of original suppliers, but how could such huge operations take place with thousands of dual-purpose equipments in absolute ignorance on the part of a group of more than 30 supplier states? This leads to further suspicion that beyond technicalities, the export control arrangements might have been intentionally by-passed.

There are many outstanding questions still remaining which we don't want to get into anymore. The fact that the whole scenario has been teaching the international community a good lesson is a bit satisfying.

5) The export control regimes initially did not even consider the NPT as a supply condition. As was elaborated in detail by the distinguished speaker, the agreement was reached upon the full-scope safeguard as the export condition only in 1992. This means that the suppliers group realized that adherence to NPT and safeguard agreement provides sufficient basis for export. Unfortunately as was our initial comment, selective political approaches undermined these criteria and recipient countries continued to suffer the same insecurity in the field of peaceful applications of nuclear energy for their economic development. Since detection of the Iraqi clandestine nuclear operations, the international community through the IAEA has shown keen interest towards strengthening the effectiveness of the Agency's safeguard system. Today we're all happy to witness that the hard struggle towards this achievement has borne fruit. For the first time in the Agency's history and through active participation of more than sixty of its member states the model protocol additional to the safeguards Agreements under Program 93+2 was developed and approved, a protocol deemed to be a strong legal instrument by which almost all clandestine nuclear activities can be detected. Thus, there remains no excuse for the NSG and its member states nor for the respective governmental authorities to deny legitimate requests for export of nuclear material and technology needed for peaceful applications in recipient countries. This era marked by the new additional protocol provides hope for a revival of enhanced and unbiased international cooperation in nuclear energy.

6) Lastly, the increase in membership of the NSG seems not to have been accompanied proportionally by increased and facilitated nuclear trade between exporters and recipients outside the group. It suffices to refer to the pie chart in annex 3 of (INFCIRC)/539 which serves as an example to this argument. The chart shows that almost 100% of the export license applications have been granted approval by the NSG for the years 1993 to 1996. Such relative statistical data can be quite misleading. The reality is that almost the same percentage of the volume of export/import has taken place among the NSG member states themselves. This can be seen in the nuclear power sector. Out of 442 operating nuclear power plants (NPPs) in the world today, 415 are operating inside 34 member states of NSG. This means that more than 95% of nuclear fuel and equipment for NPPs has been traded within the NSG itself and the other 5% has been to China, India, Newly Independent States of the former Soviet Union, Mexico and Pakistan. If this trend continues and a revolutionary unbiased expansion in peaceful nuclear trade as envisaged by Art. IV of the NPT does not take place, it will to our regret lead to a universal tragedy, a failure to the indefinitely extended NPT and a total disappointment on the part of developing world which is terribly in need of fast economic development.

Biographical Information:

H.E. Ambassador Ayatollahi received his Ph.D. from the University of California at Berkeley in 1978 in the field of geological engineering. He earned his Bachelor of Science in petroleum engineering at the Abadan Institute of Technology in Iran (1967) before completing graduate studies at Berkeley, where he also received his Masters of Science in mechanical engineering. After the Islamic Revolution in Iran (1979), Ambassador Ayatollahi joined the Ministry of Petroleum and became Deputy Minister. In 1982, he held his first diplomatic assignment as the Ambassador of Iran to Malaysia. In 1987, he joined the Atomic Energy Organization of Iran (AEOI) as its International Adviser. Since 1991, he has been the Resident Representative of the Islamic Republic of Iran to the IAEA, and he represented Iran at the 1995 NPT Review and Extension Conference.

Attachment

NSG MEMBER STATES

(AS OF SEPTEMBER 1997)
NUMBER OF NPPs (Nuclear Power Plants)

	Country	NPPs
1	ARGENTINA	2
2	BELGIUM	7
3	BRAZIL	1
4	BULGARIA	6
5	CANADA	21
6	CZECH REPUBLIC	4
7	FINLAND	4
8	FRANCE	57
9	GERMANY	20
10	HUNGARY	4
11	JAPAN	53
12	REPUBLIC OF KOREA	11
13	NETHERLANDS	2
14	ROMANIA	1
15	RUSSIAN FEDERATION	29
16	SLOVAKIA	4
17	SOUTH AFRICA	2
18	SPAIN	9
19	SWEDEN	12
20	SWITZERLAND	5
21	UKRAINE	16
22	UNITED KINGDOM	35
23	UNITED STATES	110
	TOTAL	415

Commentary 2, Session 2

*Ms Carmen Richter Ribeiro Moura, Deputy Head
Division of Disarmament and Sensitive Technologies (DDS)
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Brazil and the Nuclear Suppliers Group A Recent NSG Member State's perspective

The fact that Brazil became a member of the NSG in April 1996, during the Buenos Aires Plenary, is not a mere coincidence. For almost 20 years now, Brazil and Argentina have been engaged in a process of political and economic integration. A capital result of this process is the creation of MERCOSUL, which is today the fourth largest trade bloc in the world. On the political level, the Brazilian-Argentinean approximation has yielded several fruits, including the cooperation for the peaceful uses of nuclear energy and for the non-proliferation of arms of mass destruction, especially nuclear weapons.

From the beginning of the 80s, both Brazil and Argentina underwent profound changes in their respective political systems. Redemocratization provided for a significant transformation of both countries' views on a number of issues, on the internal and external levels. The consolidation of democracy led to the abandonment of the emphasis on a competitive approach between Brazil and Argentina in favor of a highly cooperative attitude.

On the international scene, this period was marked by the waning of tensions between the superpowers, which ultimately led to the end of the Cold War, and by the consolidation of two important tendencies: growing economic globalization, based on the intensive use of advanced technologies; and a new international agenda, inspired by the industrialized countries, in which non-proliferation of mass-destruction weapons acquired capital importance.¹

On the internal level, both countries were engaged in efforts to resume economic growth, which meant, as far as industrial and technological policy is concerned, a complete change of perspective. The self-sufficiency approach was replaced by the interest to acquire last generation technologies, which were considered essential for the modernization of industries in Brazil and Argentina.

All these tendencies contributed to a joint non-proliferation policy carefully constructed by Brazil and Argentina, with very positive results on the bilateral, regional and international levels. Bilaterally, the old rivalries have given place to close cooperation for the peaceful uses of nuclear energy. Regionally, the integration between both countries in the nuclear field has helped to build the Mercosul. And internationally, Brazil and Argentina have consolidated their image as reliable countries, and are now in a much better position to negotiate access to sensitive technologies.

¹ For a thorough analysis of the integration between Brazil and Argentina in the nuclear field and its influence in the construction of MERCOSUL, see Everton Vieira Vargas, *Átomos na Integração - A aproximação Brasil-Argentina no Campo Nuclear e a Construção do Mercosul*, Brasília, 1997

We turn now to Brazil's adherence to the NSG as a member of the regime. It is important to note that, although we continue to consider international treaties and conventions with universal character as the preferable basis for our non-proliferation policy, we believe the NSG to be an international parameter for export controls of nuclear-related goods. This is because it has clear rules, has been acquiring more transparency and has a comprehensive character.

To this respect, it is also worth mentioning that Brazil believes there is a close connection between disarmament and non-proliferation, development and access to advanced technologies. This view is an inherent characteristic of Brazil's non-proliferation policy and also permeates our action in international fora on related issues.

Before joining the NSG, Brazil had already concluded important agreements in the field of non-proliferation and passed legislation relating to export control of sensitive technologies. Those agreements are:

- Agreement between Brazil and Argentina for the Exclusively Peaceful Use of Nuclear Energy (known as the Guadalajara Agreement), which was signed in July 1991 and created the Brazilian-Argentinean Agency for Accounting and Control of Nuclear Materials (ABACC);
- Agreement between Brazil, Argentina, ABACC and the IAEA for the Application of Safeguards, which came into force in March 1994 and corresponds to a fullscope safeguards agreement;
- the Treaty of Tlatelolco, which creates a Nuclear Weapon Free Zone in Latin America and the Caribbean and came into force for Brazil in May 1994, after being amended.

Other actions taken by Brazil in the field of non-proliferation include the signing of the CTBT in September 1996, the announcement of the decision to adhere to the NPT, last June, and the UN Resolution 51/45 B - The Southern Hemisphere and Adjacent Areas Free of Nuclear Weapons. This initiative was proposed by Brazil and co-sponsored by States-Parties to the Treaties which create Nuclear Weapon Free Zones: Tlatelolco (Latin America and the Caribbean, 1967), Rarotonga (South Pacific, 1985), Bangkok (Southeast Asia, 1995) and Pelindaba (Africa, 1996). It seeks the acknowledgement by the UN of the denuclearization status of the Southern Hemisphere and adjacent areas for military purposes and is also intended to be a contribution towards general and complete nuclear disarmament.

As far as national legislation relating to non-proliferation and export control of sensitive technologies is concerned, it is important to mention that the Brazilian Constitution of 1988 precluded the use of nuclear energy for any non-peaceful ends. This principle is the backbone of the Brazilian nuclear non-proliferation policy and is closely connected to the regulations established by Brazilian Law on the subject. The Brazilian legislation for export control of nuclear related material is based on Law n° 9112, of October 10, 1995; Decree n° 1861, of April 12, 1996; and Executive Act n° 61, of April 12, 1996. Law n° 9112 authorizes the Brazilian Government to exercise export controls on sensitive goods and related services, especially in the nuclear, chemical, biological and missileic fields. An important feature of

the law is that it provides for administrative and penal sanctions for individuals and companies which act in violation thereof.

Decree n° 1861, signed by the President of the Republic on April 12, 1996, regulates Law n° 9112 in the field of nuclear exports. It approves Directives and Instructions. The same edition of the Federal Register where the decree was published contains Executive Act n° 61, signed by the Secretary for Strategic Affairs of the Presidency, where the items to be controlled are listed.

The Directives are a translation into Portuguese and an adaptation for the sake of conforming with Brazilian legal requirements of the guidelines contained in documents INFCIRC/254/Rev.2/Part 1 and INFCIRC/254/Rev.2/Part2/Mod.1, relating respectively to the export of nuclear material, equipment and technology and to the export of nuclear-related dual-use items.

The Instructions deal with the manner in which the controls are to be exercised. A Commission is established composed of several organs of the Federal Government listed in Article 5 of the Directives, which have responsibility in the process. If there is consensus among those organs for the authorization of a transfer of a controlled item, the Secretary for Strategic Affairs of the Presidency issues the authorization, which will be followed by an export license. If, however, no consensus is reached, the issue is brought to the attention of the President himself, who will make the final decision. The procedure is very much the same as the one followed in relation to the Missile Technology Control Regime (MTCR) controlled items, with some obvious changes. For example, as far as MTCR items are concerned, the Brazilian Space Agency is involved in the process, whereas in connection with NSG items the Nuclear Energy National Commission will have an important role to play.

Brazil's experience as a NSG member is quite recent. Last July we had the Nuclear Suppliers Group Information Sharing System (NISS) installed at the Secretariat for Strategic Affairs, the institution which is responsible for the operation of the system. We consider that the NISS is instrumental for a quick exchange of information among Member States and that it greatly facilitates the implementation of the NSG regulations. The National Nuclear Energy Commission (CNEN) and the Ministry of External Relations (Division of Disarmament and Sensitive Technologies) are also directly involved in matters relating to the NSG.

Up to now, Brazil has not issued any export denials, but we have a potential to manufacture nuclear related items in the future. In this sense, it is worth mentioning that our interpretation of the principle contained in INFCIRC/254, Part 1 (Guidelines for Nuclear Transfers - para. 1) - which establishes that nuclear weapon States are not subject to the requirement of final use guarantees - is non-discriminatory. Our legislation requires final use guarantees from all countries, regardless of their status as nuclear or non-nuclear.

After talking about Brazil's experience as a recent NSG member, I would like to conclude by saying that Brazil's adherence to the regime can be seen as a further step in the Brazilian nuclear non-proliferation policy. We consider the NSG as an important regime to regulate and at the same time to facilitate the commercial flow of nuclear related materials and services.

Biographical Information:

Ms Moura is a Brazilian diplomat who has had extensive experience in Brasilia and at Brazilian Embassies and Permanent Missions in New York, Rabat, Washington and Caracas. During her posting in Washington she was responsible for Scientific Cooperation, Nuclear Energy and Non-Proliferation. She is currently the Deputy Head of the Division of Disarmament and Sensitive Technologies in the Ministry of External Relations in Brazil, where she is responsible, among other things, for export control policy.

Keynote Speech, Session 3

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Nuclear Export Controls in Practice: getting the balance right

Introduction and context

Yesterday's sessions concentrated very much on the context in which we operate nuclear export controls and the way in which they have developed over the years - which could be called the “why” of export controls.

My aim today is to try to show that nuclear export controls can be implemented in a way that is consistent with international non-proliferation obligations without impeding legitimate trade and without imposing excessive burdens either on suppliers or authorities administering the controls - if you like, the “how” of export controls.

Although I shall be speaking from a UK perspective, I hope that what I have to say will illustrate some general themes that you will find applicable to the situation in your own states.

Any system of export controls, while it may draw on common principles and guidelines, must in practice be tailored to the particular situation of the state in which they are implemented. I will, by way of background, just take a few moments to recap on the UK situation in this field, with apologies for some necessary repetition of what has gone before:

- the key fact which determines our nuclear non-proliferation obligations is, of course, that the UK is a nuclear weapon state. Indeed as one of the three depository states for the NPT, we feel a very strong obligation to promote the aims and objectives of the Treaty. In the context of this seminar and of the particular situation of the UK, I am thinking particularly of Articles I, III.2 and IV.
- as you will also all be aware, the UK has a large and long-established civil nuclear industry as well as an advanced industrial sector:
 - about a quarter of the UK's electricity needs are met by nuclear power.
 - UK companies are capable of providing virtually the complete range of fuel cycle services, from fabrication to reprocessing.
 - UK industry supplies a wide range of specialist goods and technology - from vacuum pumps to oscilloscopes - for use in the nuclear industry. In short, UK industry has a wide range of capabilities as a supplier of NSG-controlled goods and technology.

Now this is not simply an elaborate sales pitch on behalf of UK industry - there is an important point that I want to make. It has been said in the past by critics of the international nuclear export control regimes that the members of the regimes are content to hide behind their Article I, II and III obligations in order to avoid their Article IV obligations to facilitate technology transfer. That argument simply does not recognise the economic realities faced by the supplier states.

While nuclear power does play a significant role in the energy strategies of a number of developed industrial states, it has to be recognised that this is not a growing market - there is almost no construction of new nuclear power stations going on in Europe, for example. On the other hand, it is well known that in some of the rapidly developing economies of the world - such as China - expanded or new nuclear power capacity is being considered as one way of addressing increased energy needs. Far from wishing to prevent technology transfer our industry is very keen to export to those markets and help to meet those needs.

The balance that I refer to in the title of this address is the one to be struck between the legitimate desire of UK industry to win business and to export their goods and technology on the one hand, and the need of the government to fulfil its commitments and obligations to the international community on the other. The implementation of nuclear export controls is the way we try to get the balance right.

Implementing nuclear export controls in practice

Legislation

Export controls have been used for a wide variety of purposes over the years, all of which require a legal instrument to implement them. One of the key features of any legal basis is a definition of what is to be controlled. It is important both from the point of view of the exporter and from the point of view of government, that export controls should extend only as far as absolutely necessary and should be clearly stated.

It is perhaps self-evident that the fewer items that are controlled, the lighter the burden on exporters. It is possibly somewhat less obvious, but an equally important point that the wider the export control net is cast, the less effective it may be in terms of preventing individual exports from slipping through because the resources of licensing and enforcement agencies become too thinly spread over too wide a range of goods and suppliers. Moreover, in a world where states do not exercise a monopoly over relevant technology there is little practical sense in operating a system of controls differing greatly from that of other possible suppliers. This is one of the driving forces for international co-operation in setting up control regimes such as the NSG.

Another relevant factor for the UK in the development of our export controls is our membership of the European Union. Although it has developed far from its original base, the Common Market with the principle of free movement of goods between Member States remains one of the central features of the EU. While the practical implementation of export controls remains the responsibility of individual Member States - we are each responsible for the upkeep of our own part of the fence - this principle is a powerful economic driver towards a harmonised approach to export controls complementary to our shared commitment to non-proliferation objectives.

Our common approach is based on membership of the various international export control regimes. In the case of nuclear exports this means that the Nuclear Suppliers Group Guidelines and in particular the lists of controlled goods and technology provide the basis from which EU-wide legislation is derived. Some features of the EU legislation - which goes by the snappy title of Council Regulation (EC) No. 3381/94 on the export of dual-use goods and Council Decision No 94/942/CFSP as amended - are worthy of note because they reflect the general approach of the NSG Guidelines:

- the legislation sets out a framework - such as the basic requirement that goods and technology subject to the legislation require an export licence - but does not prescribe in great detail the procedures that have to be followed, which is left to the Member States.
- the legislation also sets out a common list of goods and technology that are to be controlled as a minimum. In the case of nuclear goods and technology, the EU list is composed almost entirely of the NSG lists (there are a few remaining items left from COCOM lists but those which are not also reflected in the lists of the current international control regimes are gradually being removed). Member States may maintain their own controls beyond this list but in practice (and for the reasons I have just explained) there are very few items so controlled - in the case of the UK, there are no such additional controls in the nuclear field at present.
- the legislation also allows for other goods and technology not on the list to be controlled if the exporter knows, suspects or is informed by the Authorities that they will be used in support of programmes to develop Weapons of Mass Destruction. This is the so-called “End-Use” or “Catch-All” control.

Legislation in general, and specifically the European legislation I have just been describing, is the key to transparency in export controls. These are publicly available documents that set out what is controlled.

Process

Once you have a legal base you have then to put it into practice - export licensing procedures are required and an organisation to carry out those procedures. The Export Control Organisation, which is part of the Directorate within the Department of Trade and Industry that I head, is responsible for administering export controls in the UK.

In brief, the general licensing process in the UK is as follows:

An exporter submits a licence application to the DTI. The goods are given a technical 'rating' - an assessment against the control lists as to whether the goods in question actually require a licence at all and, if so, in which category they fall. Depending on this, and on the destination, a decision is taken as to whether to circulate the licence for further advice to interested parties (in the case of nuclear exports, primarily, the Foreign and Commonwealth Office, the Ministry of Defence and other parts of the DTI). In particular, advice will be sought on the strategic and political implications of allowing the goods to be exported.

In the case of nuclear exports, advisers will look at applications in the light of the criteria set out in the NSG Guidelines - factors taken into account may include, has the recipient country ratified the NPT, does it have a full scope safeguards agreement with the IAEA, is anything known to the detriment of either the exporter or the consignee, is the end-use appropriate to the goods and technology?

Advisers will also look at the need to fulfil the UK's non-proliferation obligations - does the export require governmental assurances to be sought, is there a requirement to report the export to the IAEA under INFCIRC/415 ?

In the light of the advice given and on fulfillment of any further obligations, a decision is taken on whether or not to grant the licence. In the vast majority of cases in the UK the decision is a positive one - more on that subject a little later.

The burden of control

Although I have touched on the need to keep controls to a minimum, most of this address has shown how export controls can be framed in a way that is consistent with the objective of preventing proliferation. I would like now to turn to the question of the burden of control and the extent to which that might impinge on legitimate nuclear trade.

There are two charges which are frequently leveled against export controls in the nuclear field:

- first, which I referred to earlier, that they constitute a means whereby the technology “haves” can prevent the transfer of technology to the “have-nots;”
- second, that the procedures are unnecessarily cumbersome and drive up costs for the exporter which are ultimately passed on to the recipient.

I would like to deal with each of those in turn.

(i) Technology denial

If there is one message that I would like you to take from this address, it is this: - suppliers of dual use goods in general and nuclear goods in particular have no intention of preventing the transfer of those goods to developing countries.

As I have said, one reason for this is that the UK and other suppliers do take their commitment to Article IV of the NPT and related commitments to the IAEA very seriously. There are also the practical and economic considerations - not only do exporters wish to sell as much as possible for their own benefit, there is the economic benefit to the supplier country in terms of jobs and tax income.

It is of course easy to stand here and say these things, but we also need to look at the evidence to see if it bears out my claims.

One piece of evidence I would cite in favour of my argument is the way in which the control lists develop. Just this year, the decision was taken by the NSG at its Plenary meeting in Ottawa to remove oscilloscopes from control thus making their transfer easier. NSG members continually review the lists to ensure that the scope of controls is still appropriate.

But the real debate is whether or not the number of denials of those goods that are controlled is too high. And the fact is that the level of denials is very low.

There are around 200 individual applications each year for licences to export NSG goods and technology from the UK. This splits fairly evenly between Part I goods and Part II goods - although that does underestimate the number of exports of Part II goods somewhat - because simplified export licensing procedures apply to quite a number of Part II goods.

Denials of export licences for NSG goods have been running at about 5% of applications - again that splits fairly evenly between Part I and Part II goods. In absolute terms that is also a very low number - about 10 per year. Many Part II goods are subject to simplified licensing procedures, and of course there is no requirement for a licence at all for all but a very few goods destined for other EU Member States, so that figure of 5% in fact significantly overestimates the level of denials as a proportion of real exports.

There are some who would argue that even that level of denials is too high, so let us look more closely at the issue of denials. In fact very few countries are involved. The majority of the small numbers of denials were for applications to export to countries who have not ratified the NPT. That should come as no surprise - the NSG Guidelines are quite clear about suppliers' obligations: and here I am thinking about paragraph 4(a) of the Part I Guidelines. Where a state is not a State Party to the NPT and does not have a full scope safeguards agreement with the IAEA, suppliers *a priori* cannot have confidence that goods or technology will not be used in support of unsafeguarded nuclear activities and under those circumstances we do not issue an export licence.

Even that is not the whole story. There is some trade with non-NPT parties. Brazil is, of course, a fellow NSG member, but not an NPT party - although I should like to say that we in the UK very much welcome the recent announcement on the part of the Brazilian authorities that she is beginning the process of acceding to the NPT. However, since Brazil has concluded a full-scope safeguards agreement with the IAEA, trade in Part I goods has been possible (albeit still subject to the requirement to report such trade to fellow Zangger Committee members).

In the case of Part II goods, there is trade even with those non-NPT parties who do not have full-scope safeguards agreements with the IAEA. In these cases, as our legislation and the NSG Guidelines require, as well as considering the non-proliferation commitments of the countries concerned we also have regard to the intended end-use of the goods. We approve more Licences for Part II goods for non-nuclear industrial end-uses to these countries than we deny.

This of course leaves the most difficult cases of all: denials of export licence applications to NPT parties. I stress once again that the numbers we are talking about here are tiny - no more than one or two per year. However, some of you will - quite reasonably - ask why, when states are apparently meeting all the necessary non-proliferation requirements are there still such denials, however few. The answer lies in the experiences we have all had with Iraq, which contributed to the development of the NSG Dual-Use Regime in the first place. Put simply, we now have experience of states who have paid lip service to international non-proliferation commitments and simultaneously pursued clandestine programmes for the

development of weapons of mass destruction. In those very few cases where we have good reason to suspect that goods are likely to be misused, we will not issue a licence.

Before I move on, I would like to say that the decision to deny an export is not taken lightly - extensive consideration is given to all the factors and we try to get exporters, in consultation with their customers, to give us as much information as possible to support their case. Moreover exporters have the right to appeal against a decision to deny. NSG members also have a system of notification in respect of denials of Part II goods - this is another mechanism of ensuring a common approach to their non-proliferation commitments but also allows members to take account of information from other members that might lead to them allowing a particular export. Denials are also reviewed on a periodic basis. All of this is designed to ensure that we only deny when we are as sure as we can be that there is a real risk that an export could contribute to a nuclear weapons programme.

(ii) Costly to exporters ?

There is no sense in my trying to argue that maintaining any form of export controls does not place a cost on exporters, which, of course is passed on to customers in the price that they pay. However, we do as a matter of policy try to keep the cost of export controls to an absolute minimum. As I have said before, the business of export controls is a matter of balance and one of the factors we have to balance is the competitiveness of UK industry. The last thing we want is a policy that allows us to export particular goods but procedures so cumbersome and burdensome that the export of those goods becomes unattractive to prospective customers. We therefore do everything we can to lighten the load on exporters:

- we try to process licences as quickly as possible - in the UK we try where possible to process a licence application in 20 working days: this has to be seen in the context of the fact that there were more than 15,000 licence applications in the UK last year of which as I have mentioned about 200 were for NSG goods.
- we have a number of simplified procedures designed to reduce processing times and the number of applications. These include:
 - Open General Export Licences, which allow defined goods to be exported to a defined number of countries, subject only to a requirement on firms to register with the DTI that they are using the licence and to keep records available for inspection by the Export Control Organisation - some NSG Part II goods come under such Licences.
 - Open Individual Export Licences which allow individual exporters with a proven track record of successful exports to a given country or countries, with a prospect of continuing business to export defined goods to specific consignees in named countries, again subject to record keeping and verification checks.
 - Both these mechanisms cut down the administrative burden on exporters by eliminating the need for multiple applications.

In addition, the UK both in its own right but also as a Member State of Euratom is party to a number of bilateral co-operation agreements in the field of nuclear energy. One useful feature

of these agreements is that a number of them provide the formal governmental assurances required by the NSG Guidelines -covering peaceful uses, physical protection, and retransfer. This reduces the need to seek assurances for each and every export and hence reduces the administrative burden both by speeding up consideration of the licence application, and also reducing the burden on the recipient administration, which does not need to process so many requests.

Again I return to my theme of balance - we try to pitch our controls at the appropriate level necessary to fulfil our international commitments.

Conclusions

The main conclusions that I wish to suggest are as follows:

The UK considers nuclear export controls are not only consistent with NPT and other international nuclear non-proliferation commitments, but that their implementation is the only way that we can undertake nuclear trade and be confident that we are not contributing to the proliferation of nuclear weapons.

Our aim is to implement controls in a way that is as open and transparent as possible: our legislation is openly available and based almost exclusively on international agreements and published criteria, in particular, the NSG guidelines. I hope in some small way that my explanation of our procedures here today has contributed a little to that transparency.

We have both a policy commitment and a need to keep the burden as low as possible on exporters, on recipients and on governments consistent with fulfilling our international obligations. Again, I hope that I have been able to demonstrate to you that we do indeed keep the burden at a reasonable level - denials are rare and only made with good reason and we do everything we can to make it easier for exporters to do business.

Throughout this address I have talked about balance and about getting it right. The challenge for the future will be to maintain that balance. Since the future of export controls is the subject of the final session, I will not go into great detail here, but I would like to point to one or two issues that are likely to have an impact:

- we live in a world of changing international commitments with an ever greater emphasis on the verification of those commitments. The strengthened safeguards system of the IAEA under Program 93+2 is a case in point and just one example of where an effective system of export controls is an ever more necessary part of fulfilling those commitments.
- technology controls are a relative latecomer to the NSG but growing in importance. Developing countries are increasingly seeking to purchase technology and services as part of the development of indigenous capabilities. The nuclear field is no exception to this. However, this brings a proliferation risk. We need to find effective ways to minimise the risk, while allowing trade to flourish and giving developing countries access to the technology that they need.

As these two brief examples show, supplying countries are faced by a constant need to examine and adjust controls to ensure that we continue to get the balance right. I hope we prove equal to the challenge.

Biographical Information:

Dr Roger Heathcote did research in High Energy Nuclear Physics before joining the UK civil service. While most of his career has been spent in energy-related areas it was not before taking up his present position as Director of Export Control and Non-Proliferation at the Department of Trade and Industry and the UK's Governor to the IAEA that he found himself in an area where this earlier research was of direct relevance.

Commentary 1, Session 3

*Mr Toshiki Miyamoto
Chairman of the Nuclear Energy Systems Steering Committee
The Japan Electrical Manufacturers' Association
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A Japanese Supplier's Perspective on Export Control

Introduction

Our concern today is how export controls impact on the industry. My views reflect those of Japanese plant and equipment suppliers. I welcome this opportunity to address you, as I believe international forums such as this, where we can share information and exchange views, serve us all in understanding how best to implement appropriate and effective export controls.

Underlying my comments is the certainty that nuclear energy has an important role to play in assuring a secure, clean power supply. In Japan, the peaceful application of nuclear energy to power generation has made a significant contribution to Japan's energy security and its economic growth. It can do the same in other countries. I would contend that nuclear technology is essential not only for Japan's future growth but also for the world to achieve sustained development.

The history of nuclear technology in Japan has passed through three phases: from importer of technology, proceeding to 'made-in-Japan' status, and followed by advances that brought Japan to the point where it is a technology innovator and supplier. Among nuclear suppliers, Japan is one of the Non-Nuclear Weapon States (NNWS). I think that positions us to understand the situations of both the suppliers and recipients of nuclear power technology.

The nuclear industry and its market

If we view the future of the nuclear industry from a Japanese supplier's point of view, our eyes inevitably turn to Asia. As the countries of Asia work to modernize their economic systems, they also need to achieve energy security. Here, much needs to be done. As recently as 1992, Asian countries accounted for only 8.9% of the world's primary energy demand. By 2010 that is expected to triple to 26.2%. For those countries, securing stable energy supply is an extremely important concern, as demand not only threatens to outstrip supply, it often does. Faced with the alternatives, the Asian countries see nuclear power generation as a powerful means to securing a long-term, stable supply of large capacity output in harmony with the environment.

Following in Japan's footsteps, other Asian countries, especially the high growth economies, are now preparing to introduce or expand nuclear power. Nuclear power stations with a total

output capacity of 40GW are at the planning stage, and plants will be built in most Asian countries. In short, with the exceptions of Japan, Korea and India, all of which have their own domestic supply industry, most Asian countries intend to import nuclear power plants. An essential component of the successful completion of these projects is an export control system that assures the smooth transfer of technology and equipment.

This widening market for nuclear plants raises a number of questions. How can we best assure control of exports of equipment and technology for nuclear plants? How do we assure peaceful use of nuclear technology and the non-proliferation of nuclear weapons?

As Dr. Heathcote said in his keynote speech, the transfer and use of nuclear technology and equipment promotes tension between article four of the Non-Proliferation Treaty (NPT), which addresses the right of the recipient to use nuclear energy for peaceful purposes, and article one to three, which calls for safeguards to prevent nuclear proliferation. Nonetheless, I am sure no one would contradict my understanding that the NPT aims to prevent the spread of nuclear weapons while guaranteeing the right to use nuclear energy technology for peaceful purposes. We must achieve that in an expanding market for nuclear plant and to meet rising demand for energy. I think that the way to achieve balanced export control is to understand how the market will develop, to look at the experience of other countries to date and to consider current practices.

The future and Asia

I believe that the growth of nuclear power in Asia will follow the same broad course as it did in Japan, this time on a regional rather than national basis. First of all, individual countries will import nuclear power plants. That will soon give way to a greater stress on technology transfers, supported by local economic and industrial development. From this will emerge the prospect for cooperation among Asian countries that will produce an international transverse and or vertical cooperation in nuclear power related manufacturing. We can see this as a consortium of countries rather than companies.

To put it another way, I assume time will see an end to the one-way transfer of nuclear power plants and equipment from one country to another in favor of multi-directional transfers of equipment and technology among Asian countries. Promoting smooth transfers may be a key for success in developing the utilization of nuclear energy in Asia countries and, in the end, a major influence on Asia's future economic development.

An export control system for Asia based both on bilateral and multilateral exports and imports will be best suited to the regional reality. The system must focus on and be able to support the multinational transfer of equipment and the multinational division of manufacturing we expect to emerge. A suitable model for this kind of control system already exists in Europe, where Euratom operates on the assumption of just such multinational transfers.

Once the basic model is in place, we must consider how it operates. I want next to look at the kind of export controls and safeguards we need for the export of nuclear plants.

As I have said, there is a need to respect the goal of non-proliferation of nuclear weapons while avoiding obstacles to the peaceful use of nuclear energy technology or measures which deter adoption of nuclear power energy where that energy is necessary for social development.

Assuring export control

In his remarks, Dr. Heathcote reminded us that the UK government believes that equipment suppliers and authorities should not be burdened with over-regulation, that legal trades should not be prevented, and that nuclear export control should be executed with respect for the responsibility to observe nuclear non-proliferation. I agree with this and with Dr. Heathcote's observation that the starting point to export control, the means to enjoy peaceful uses of nuclear technology and to avoid proliferation of nuclear weapons, lies in respect for the NPT and international agreements.

I think Japan provides a case in point. Today the country can point with pride to nuclear-related technologies covering the range from nuclear power generation to the nuclear fuel cycle. Among factors that have supported Japan's success in this area are such international agreements as the NPT and the NSG Guidelines. Added to these are the role of international organizations like IAEA, and the safeguards specified in bilateral nuclear agreements, like those Japan has with the US, the UK and France.

Scrupulous observation of international agreements and regulations allowed Japan to import technologies for nuclear power generation and the fuel cycle from the US, UK, and France and to develop its own industry. While Japan actually started to import nuclear-energy related technologies before the implementation of the NSG Guidelines, it nonetheless observed restrictions with an equivalent scope.

I want to see Japan's successful experience repeated in Asia and other countries of the world. I would like to see Japan offered as an example that tells other countries that an export control system designed to prevent nuclear proliferation through respecting the NSG Guidelines, and which observes the IAEA safeguards to the fullest extent, need not be an obstacle for countries which promote the peaceful uses of nuclear energy.

If I had to add an additional requirement, one intended to completely remove concerns about nuclear proliferation, it would be that we should take into consideration the political stability of the recipient country, in addition to discussing safeguards and strengthening export controls. However, I would also like to emphasize that, properly undertaken, equipment and technology transfers actually help to maintain non-proliferation, and offer benefits to both the receiving and supplying country.

Extending dual-use technology

One area where concern is often expressed is in connection with dual-use technology. Once again, I will look at how Japan deals with this, and offer some comments.

Japan's Foreign Exchange and Trade Control Law incorporates the NSG Part 1 and Part 2 requirements for the control of exports of nuclear energy equipment and technology transfer; the same law also applies NSG Part 2 to dual-use equipment and technology.

The same law also supports a supplementary scheme, similar to Europe's "Catch-All", for control of the proliferation of weapons of mass destruction. The main concern here is dual-use technology. On the face of it, this may seem reasonable.

There are many more applications for dual-use equipment and technology that are not nuclear related, and these must be monitored. As Dr. Heathcote suggested, the international obligation to observe non-proliferation of weapons of mass destruction should be well balanced with a concern not to hinder the industry's free trade.

The point I would like to make is that this system works. In the case of my own company, Toshiba, almost 100% of individual export licenses for direct exports of dual-use products were approved, and about 10% of those covered dual-use products controlled by the NSG. Among the major products and technologies were manufacturing equipment, instruments, robots, and oscilloscopes, all equipment for general use. Information given to me by a manufacturing equipment producer reveals that 80% to 90% of the export licenses that it obtains are for the general use of dual-use products under NSG control. The point here is that implementation of thorough in-house control systems results in a situation where very few applications for an export license are ever denied.

The key points in export control of dual-use equipment and technology are checks on the end-use and the end-user. Where these can be clearly identified, simplified, faster export control procedure can be expected, such as simplified export licensing procedures. While many companies make full use of this, I would like to see the range of use greatly widened.

**Desirable attributes of nuclear export control -
The role of government and international organizations**

I would now like to move on to consider the kind of export control system that would, I think, best support our industry.

Dr. Heathcote was right in saying that the purpose of export control should be as transparent as possible, and that control criteria should be based on international agreement. Any costs incurred in such a system should be kept to a minimum.

The industry believes the role of government is two-fold: to establish simplified export control procedures and to ensure their transparency.

Simplification means a faster export control system with less complex procedures and the extension of simplified export licensing procedures to cover more products and regions. Continued consideration should be given to what items can be deregulated, as in the recent case of the oscilloscope.

Transparency of control, of the standards of judgment, and of whether or not an item is listed as a controlled one, is important, in order to assure unified decisions from country to country and person to person. The major cost in control is spent on interpretation of decisions, making it desirable that information related to the grounds of a judgment is shared among the concerned countries and made available to people responsible for export control. Simplification and transparency should be achieved not as the result of the efforts of a single country but by an international consensus.

Another area that must be addressed by governments applies to export control in general, and concerns the impact of the Internet and the emergence of electronic trade, including nuclear

energy related trade. This is an issue that needs to be discussed from the viewpoint of overall control of nuclear-related exports.

The role of industry

The role of industry in export control is to pursue free economic activities, while observing legal obligations, following export control regulations, making efforts to contribute to their country's growth, and operating with the hope of contributing to the world's economic growth. This is self evident enough that I feel no need to mention it any further, other than to say that, in connection with export control of security-related products, such as those for nuclear energy, Japanese corporations have made their best efforts to support the world's continued peace and safety.

In Japan, major exporters follow the Ministry of International Trade and Industry's (MITI) guidance and have in-house regulations or compliance programs in line with the export laws. They have established in-house controls to assure proper execution of control of security-related items.

Industry organizations support such efforts by promoting exchanges and providing information on questions raised, and working for improved export control procedures, all based on the day-to-day practices and experience of companies. The Center for Information on Security Trade Control (CISTEC), for example, provides information and chairs many committees. Participating corporations can offer their views and make suggestions to MITI on points to be improved in the control procedures.

Concluding Remarks

In closing, let me recap my remarks. Japan sees Asia as a promising market for nuclear plants and equipment, and is confident that the region will develop a multinational business model for trade in such equipment. This will require an appropriate export control model, and Euratom provides a good example.

Further to this, the case of Japan supports the proposition that current export controls, based on international agreements, provides a basis for development that allows peaceful uses of nuclear technology, while avoiding proliferation of nuclear weapons. The role of government is to support export control with a control system as open and transparent as possible, based on international agreements. We agree with Dr. Heathcote and the example of the UK in this.

While current export controls need to be improved to extend license agreement and to reduce the burden on the industry, an export control system like that I have just mentioned helps to maintain world peace and safety. I think a continuation of the cooperative approach by government and industry will help to assure strict observation of non-proliferation and to promote export control supporting peaceful use of nuclear energy.

Biographical Information:

Mr Miyamoto is a graduate in electrical engineering from Tokyo University. He joined the Toshiba corporation in 1960 and was involved, among other things, in managing its activities in nuclear core design, reactor design engineering and nuclear energy systems. Since 1996, Mr Miyamoto has been Chairman of the Nuclear Energy Systems Steering Committee of the Japan

Electrical Manufactures' Association and is Senior Vice President of the Group Executive of the Energy Systems Group of Toshiba Corporation. He is our industry representative on this panel.

Commentary 2, Session 3

Mr Freddy Sagala
Deputy Director General for Administration
National Atomic Energy Agency, Indonesia

The Practice of Export Controls: effect on nuclear trade, how they work and how they are implemented

by Mr M. Iyos Subki, Director General
National Atomic Energy of Indonesia

As a developing country which will use nuclear energy to support its electricity demand, and as party to the NPT, Indonesia always conforms to safeguards requirements and fully supports their implementation; furthermore, Indonesia is also in full support of the implementation of safeguards principles in the form of applying S.S.A.C. As any other country which abides by the principles of the NPT, Indonesia deserves to be accorded with:

- (a) a security of supply of nuclear materials and components;
- (b) solid, more simple and easy arrangement and transparency system on importing nuclear materials and nuclear components.

The NPT does not contain provisions regarding export controls other than the application of safeguards by the International Atomic Energy Agency (IAEA). In fact, no other international treaty concerning international security or disarmament has established an export control mechanism.

Export control in the nuclear field gradually became more effective in the 1970s, starting in 1971 with the first meeting of the Zangger Committee. For the first time the Committee listed materials and equipment that would trigger the application of safeguards in the event of an international transfer.

The same list was later perfected by the Nuclear Suppliers Group, then known as the *London Club*. This club had its first meeting in London in 1975, which in 1977 resulted in the guidelines, which were then transmitted to the IAEA.

In 1992, the Nuclear Suppliers Group adopted guidelines for transfers of nuclear-related dual-use equipment, material and related technology (published in the IAEA document INFCIRC/254/Rev.1/Part.2, July 1992). These were adopted in addition to the guidelines, which only covered exports of nuclear material, equipment and technology (IAEA document INFCIRC/254, February 1978). So, the Guidelines become more stringent, because they cover more than just the traditional materials and equipment.

Indonesia, as party to the NPT, has fully adhered to the obligation of the NPT and supported nuclear weapon non-proliferation objectives, so therefore we understand the UK

Government's responsibility, as one of the nuclear weapon states, to move toward that direction. We have signed a full scope safeguards agreement with the IAEA, and there is no reason to worry about our good faith in the field of nuclear energy. In the Indonesian new Act on nuclear energy, our commitment to prevent the diversion of the purpose of the nuclear material use is stipulated. In other words, our legislation has laid guidance in the utilization of nuclear energy for peaceful purposes only.

But, according to the implementation of Art.IV of the NPT, should we want to develop production and use of nuclear energy for peaceful purposes and therefore need materials and equipment which will be supplied from abroad, there should be no obstruction that lay ahead. We believe that requirements which became a consensus between NSG Member States in the form of export license for certain materials and equipment, should be implemented purely based on the framework of non-proliferation objectives. In this case, as stated in Art. IV, there should not be any discrimination to all "Parties to the NPT" to develop research, production and use of nuclear energy for peaceful purposes in conformity with Art. I and II. There should be no denials issued for other than non-proliferation reasons. This issue is raised because we anticipate such a possibility as the consequences of UK membership in the European Union, and even the practical implementation of export control remains the responsibility of individual Member States. How far is a harmonised approach to export control being implemented? Are any political considerations involved in that area?

As to our experience, we have not had such serious difficulties so far with respect to importing goods and technology in developing our effort to make use of nuclear energy peacefully, with the exception of nuclear material. For example, with respect to the use of a neutron generator system by an Indonesian company for oil exploration, it has been subject to export license and other retransfer restrictions and must be returned to the supplier country. The Department of Industry and Commerce informed us that there was no difficulty with regard to the import by the Indonesian company of materials and equipment listed in the Annex of the Guidelines for transfer of nuclear material and related dual-use equipment and related technology. Still today we do not have the export license for low enriched uranium from the European Union countries because of political and non-NSG criteria.

Biographical Information:

Mr Freddy Sagala has an engineering degree in Mines Exploration from the Institute of Technology in Bandung. He has been with Indonesia's National Atomic Energy Agency, BATAN, since 1981 and has worked, among other things, on the Special Staff of the Director General and as Head of the Nuclear Installation Management Unit. He became Deputy Director-General for Administration of BATAN in 1992.

Keynote Speech, Session 4

*H.E. Ambassador Pasi Patokallio, Former Chair of the NSG
Deputy Director General for Political Affairs
Ministry of Foreign Affairs, Finland*

The Future of Nuclear Export Controls

Let me first of all express my gratitude for having been accorded the privilege of making one of the keynote addresses at this Seminar, and moreover, to do so under the Chairmanship of Mr. Minty. The new South Africa has rapidly emerged as a leader in the field of disarmament and non-proliferation, particularly nuclear non-proliferation. South Africa and the Chairman personally bring unique credentials to the international non-proliferation effort, for which nuclear export controls remain a key tool. No less important is the role of South Africa as a bridgebuilder between North and South; a fact well illustrated by the membership of South Africa in the Nuclear Suppliers Group (NSG) as well the Chairmanship of this Seminar.

This Seminar is about redeeming promises in a proactive and inclusive way. The NSG is responding to the promise and challenge of increased transparency and dialogue on nuclear export controls written into Paragraph 17 of the document on Principles and Objectives of Nuclear Disarmament and Non-Proliferation, which was adopted by the 1995 NPT Review and Extension Conference.

It gives me personally particular pleasure that the NSG took the decisions to respond to these calls for more transparency largely at my urging in my capacity as then Chairman of the Group.

Trends

I have been asked to peer into the future. That is a tall order for anyone except professional astrologers. Therefore I will be brief and only discuss some trends that I see affecting the future of nuclear export controls.

Let me state my prediction and my bias at the same time: the future of nuclear export controls is assured as long as nuclear energy is commercially exploited and the NPT-established consensus on the undesirability of any more Nuclear-Weapon States holds.

The goal of nuclear export controls will remain the same: non-proliferation. It is to prevent the acquisition of nuclear and dual-use technology, materials and know-how for use in unsafeguarded nuclear activities in support of the development of nuclear weapons. And since absolute prevention is absolutely impossible, the practical goal is to slow down proliferation and raise the financial and political costs to proliferants as high as possible in the hopes of affecting the security calculus that drives proliferation in the first place.

Given the non-proliferation goal, national export controls are a key means to assure supplier Governments that they do not inadvertently assist proliferation through their nuclear exports. Without such an assurance, it would be much more difficult, even impossible for responsible supplier Governments to license nuclear transfers. Exports controls thus facilitate, not hamper trade.

I will not belabor this point any further. It is already very well explained in INFCIRC/539. The pie chart in Annex 3 says it all.

The situation with regard to proliferation-sensitive supply or demand has never been static, and will not be so in the future. On the supply-side, the membership of the NSG has grown appreciably since its reactivation in 1991. The Group now comprises suppliers from all continents. I am particularly proud of having assisted three major suppliers in joining the Group during my Chairmanship, namely the Republic of Korea, Ukraine, and Brazil. Symbolically perhaps the most significant recent member of the Group is South Africa, which joined the NSG at the Helsinki plenary, on the very eve of the 1995 NPT Conference. Having as a responsible supplier a country which used to be of prime concern on the demand side is a vindication of the possibility and benefits of stepping back even from the other side of the threshold.

The challenge that the NSG faces on the supply-side is clear: the emergence of new suppliers, such as Kazakhstan, and the key role played by one old supplier, China. In the short term, say the next 5-10 years, I would rate the latter challenge as much more important.

China is presently the only country outside the NSG that has the potential to seriously undermine the NSG's efforts. Clearly, China as party to the NPT is legally committed to non-proliferation. But so far it has not been willing to accept the two fundamental tenets of policy which the members of the NSG are committed to: the requirement for full-scope IAEA safeguards in recipient States as a condition of supply and the necessity to control transfers of dual-use items and technology.

My reading of the relevant 1995 NPT Conference decision is unambiguous: it is a political commitment by all NPT States parties to refrain from all new nuclear supply to countries without full-scope safeguards agreements in place.

I presented my reading in a number of contacts with Chinese officials after the 1995 Conference but was politely contradicted. My reading may have been correct but China had made it clear during the Conference that it did not agree. I am glad to note that there have since been some positive signs. This spring China participated in the Zangger Committee as an observer. And just last month, according to press reports, new internal regulations were issued in China to strengthen controls on nuclear exports. The next logical step should be to embrace the NSG policy of full-scope safeguards as a condition of supply, even if not yet the NSG itself.

The Dual-Use Regime of the NSG presents of course a more formidable obstacle to China. It requires a new mindset, not just a further step. If that mindset changes, as I believe it will with the growing recognition of the responsibilities of a world power, an organizational streamlining would also be in order. The Zangger Committee could be then be merged with

the NSG. It would continue its activities as a Committee of the NSG for nuclear-specific controls, just as the Dual-Use Regime does today for dual-use controls.

Challenge on the Demand-side

The NSG must also respond to the challenge on the demand-side. That is first and foremost one of dialogue and transparency. Contacts with major suppliers outside the regime, such as China and Kazakhstan, are obviously conducted with their potential membership in mind. However, the vast majority of states outside the regime are neither suppliers nor users. Some are small users and thus small suppliers, at least potentially. Some may be transshipment points.

For the small number of these countries, the NSG can either bring them in as members or devise some other means of close association. While smaller NSG members tend to be liberal in this regard, it must be recognized that manageability of the regime is a consideration. It is already perfectly possible for a country to adhere to the NSG Guidelines on its own, without asking anybody. Some have already done so and used the Guidelines as the basis for their relevant national legislation. I would wish to encourage more such adherence. In return for credible adherence, the NSG should be willing to provide fuller information than generally available to non-members.

For the vast majority of states neither interested in the NSG nor of specific interest to the NSG, timely and accurate general information should suffice and is readily available.

It is my belief that in the long run the norms set by the NSG, along with those set by the other export control regimes, will find general acceptance. The NSG has set open norms for open nuclear trade. These norms are being observed not only by NSG members but also by some other states quite unilaterally, as I noted.

Ideas for reinventing the wheel on export controls through negotiations at the UN or at some other forum will simply not fly. My advice to those who still think they can replace the NSG with something supposedly more representative is to follow the adage “If you can't beat them, join them”. That is what a number of countries now inside the NSG have done.

At the same time, there is a trend on concentrating on the essential: suppliers controlling a fewer number of items and technologies but exercising even more stringent and enforceable controls on those that remain on the control lists, whether nuclear-specific or dual-use. The downside to such downsizing is the growing attraction of catch-all controls. How to avoid unilateral action and potential misuse of this in itself is a very useful tool. I think it will continue to be in the interest of the NSG members and the like-minded that the Guidelines are implemented in a transparent manner and in line with agreed parameters.

In parallel, there is another, somewhat disturbing trend. As memories of the Gulf War and the consequent realization of the importance of Western procurement to the Iraqi WMD programmes recede, the political consensus environment in which export controls are operated comes under increasing strain. The NSG was reinvigorated and expanded into dual-use controls as a direct result of IAEA and UNSCOM discoveries in Iraq. Will the political consensus hold on preventing future Iraqs, let alone the resurgence of Iraq itself, through the

maintenance of strict non-proliferation controls? Answers to this question, which I do not have, have serious implications for the future of the NSG.

Questions have sometimes been raised about the relationship between the NSG and the IAEA. The answer of course is that there is none. The Agency is not an export controller. Still, the NSG and the Agency have a mutual interest in safeguarding that nuclear energy is solely used for peaceful purposes. At the request of the NSG members, the Agency also codifies publicly the Guidelines for all to see and use as they see fit.

With the implementation of 93+2 Protocol on extended and enhanced safeguards, the Agency will for the first time assume formal export/import control obligations. Similarly, if less binding, export/import controls form an important part of IAEA support activities in the so-called Newly Independent States. Whether these developments will necessitate striking a real relationship between the NSG and the Agency remains to be seen.

Conclusion

Let me finally sum up my predictions for the future of nuclear export controls in four points:

- nuclear export controls, and the NSG as the key forum of supplier co-operation, will remain an important component of the international non-proliferation regime;
- NSG norms will gain general acceptance over time but they will also face the challenge of fading memories of their *raison d'etre*;
- NSG norms will control less items but more stringently, with catch-all making up the difference;
- membership of the NSG will expand more slowly than the number of adherents to its norms.

Biographical Information:

H.E. Ambassador Pasi Patokallio has a long and distinguished career in the Foreign Service of Finland where he has extensive experience in security, disarmament and non-proliferation affairs, including serving as head of the Finnish delegation to various multilateral disarmament conferences. More recently, in 1995, he chaired the Fourth Preparatory Committee of the NPT Review and Extension Conference and in 1997 chaired the First Preparatory Committee for the 2000 NPT Review Conference. He was chairman of the NSG in 1995-1996 and is a member of the UN panel on Small Arms.

Commentary 1, Session 4

Dr Harald Müller
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The Future of Export Controls in International Nuclear Non-Proliferation

At the outset I want to thank the organizers for giving me the opportunity to address this distinguished audience on so topical an issue after such knowledgeable and experienced speakers as Ambassador Patokallio and Mr. Hoekema. The honour is all the greater as I can do this under the direction of our Chairman. As head of a research institute devoted to the cause of peace and disarmament, I cannot but praise the unique example that South Africa has set, being the first nuclear armed state ever to take the considered decision to dismantle a nuclear arsenal, while at the same time committing fully and uncompromisingly to the nuclear nonproliferation regime. It goes without saying that there are still some players in the field whom we expect to follow this example. In nuclear disarmament, “promise keepers” are much more wanted than on the Washington Mall.

The example of South Africa proves convincingly that nonproliferation and nuclear disarmament are siamese twins. One cannot be without the other. And in this spirit, we should recall, as we discuss the occasionally highly controversial and generally fairly technical subject of nuclear export controls, that such controls draw their justification from serving nonproliferation, and through this service create the condition of nuclear disarmament.

I. When we speak about “supplier countries”, we contribute to a grave misunderstanding: that “suppliers” reside in the North, while “recipients” are developing countries. This is not the case. All suppliers, without exceptions, are also recipients, including the largest user of nuclear energy, the United States. For this reason, the standards collectively agreed to in the NSG concern these countries themselves. Indeed, the major controversies about the one major unilateral change of supply conditions, the U.S. Nuclear Nonproliferation Act of 1978, were fought between the original members of the NSG and some other industrialized countries. Hardly any debate about supply conditions was as protracted and tough as the negotiations between the United States and EURATOM about the renewal of the nuclear cooperation agreement that was finally renewed last year. In drafting guidelines and lists, therefore, suppliers can be expected to recognize recipients' concerns in their very own best interest.

II. There is one thing I am very certain about with regard to the future of export control: the same forces will pull and push policymakers and export control authorities as in the past. These forces create a real dilemma, since some of them speak for a relaxation in the attitude towards export controls, while the others counsel enhanced prudence.

First, there is the basic interest of each state involved in international trade: the interest to enhance one's exports, because they mean profit, economic growth, employment, and public welfare. No government - and I have been following this subject now for some twenty years -

is eager to prevent its companies and citizens from engaging in international trade. I have heard it said that industrialized countries desire to deny developing countries goods and technology needed for their development, possibly to prevent the emergence of competitors. My own experience in the field does certainly not bear out this suspicion. To the contrary, there is a fairly strong presumption that trade is good and should go forward, including trade in the nuclear and dual-use fields. The small numbers of denied licenses shown by supplier states' statistics are a clear confirmation of this view.

Second, there are the particular interests of companies engaged in nuclear and dual-use trade. While it is true that nuclear-related transfers make up for only a small share in the overall economic activities of the supplier countries, much more is at stake for individual companies. These firms press their case as well as they can, even though we must recognize that many companies have become conscious of their grave responsibility for nonproliferation. Governments cannot lightly overrule legitimate economic interests of economic subjects in good standing.

Third, there is the stipulation in Article IV of the NPT that all supplier countries must take seriously. Art. IV creates a presumption that civilian nuclear exchange among NPT members is a good thing that merits support. This puts the burden of proof on those arguing against a particular transfer to a country party to the NPT.

Against these factors fostering nuclear and dual-use trade, three other forces push in the contrary direction.

First, there is the basic undertaking not to counteract the spirit and letter of the NPT. While only Art. 3,2 is an explicit commitment concerning export controls, past Review Conferences have made it clear that more is expected of suppliers than sticking to the letter of 3.2, including measures concerning dual-use equipment, material, and technology.

Second, the embarrassing experiences of several supplying countries with regard to Iraq's nuclear weapons program gave such requests particular weight. After this event, it is unfortunately impossible to assume that all NPT parties must be regarded, *a priori*, as faithful nuclear recipients. Supplier countries are obliged to recognize as a very important factor in their licensing decision NPT membership, but to look at other indicators of a country's behaviour before the license is finally granted.

Third, there is domestic public pressure not to contribute to the spread of nuclear weapons. Again, governments involved unwittingly in Iraq's nuclear weapons program felt the full weight of this pressure. The antiproliferation mood in the media and public opinion in supplier countries should not be underrated.

For these reasons, export control policy will remain as indispensable as a part of the nonproliferation regime as it will remain a difficult, complex and controversial aspect of public policy in the supplier countries.

III. The second prediction I dare to make is that the number of countries facing this dilemma, and thus the potential members of the NSG, will grow. There are five types of countries potentially in that situation:

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- the suppliers of natural uranium. Quite clearly, they are in the nuclear business, and their trade in source material should be subject to nonproliferation-guided regulation. The presence of Namibia and Niger, two significant natural uranium producers, in this seminar is thus highly appreciated;
 - countries with a role in international trade as transshipment points. Transit is a trade activity that brings prosperity to the country where it takes place. Such countries bear a responsibility to the international community that care is taken that such transit does not result in nuclear proliferation;
 - countries with emerging activities in the civilian uses of nuclear energy. Such countries develop naturally a capability to produce spares, parts, and, as time goes by, full-fledged facilities, materials, and technological know-how;
 - countries with a capable dual-use industry, for example machine tools, steel, chemistry, new materials, or electronics. Such countries are in a position to produce items tailored to specifications requested by the customer. There is an inherent danger that certain customers may abuse such capabilities;
 - finally, countries outside the NPT but with strong nuclear industries have obviously the potential to contribute to international trade. While they are not potential NSG members for the foreseeable future, they present particular dilemmas that need to be addressed. I will take up this issue later.

While we can expect the number of the first two groups of countries to remain fairly constant, more countries will have significant peaceful uses of nuclear energy, and promising dual-use industrial capabilities than in the past or today. Emerging industrial countries in Southeast Asia, Latin America or the former Soviet Union come to mind immediately, as does Turkey. These countries will face exactly the same dilemmas and tradeoffs as established supplier countries today.

IV. It is desirable that these emerging suppliers share the same framework of rules and regulations that has been developed, with so many trials and errors, by established suppliers. If and when they accept these roles, it is predictable that many of them will like to become full members of the NSG. I respect very much the argument that enlargement may bring management problems - as an EU citizen I cannot but be painfully aware of this problem. Yet a tradeoff is here involved - can we expect countries to subscribe to rules that will undergo continuous amendment and change without full participation in decision-making? I do not believe so. Changing one's own rules continually without having a say in the deliberations leading to this change is somehow equivalent to "taxation without representation", a feature that, as history has proven succinctly, is not likely to work. Some countries may be willing to accept such a position - adherence to the guidelines without membership. Many will not, but react with resentment.

In addition, while representativity is no criteria for selecting members of the NSG, greater representativity would be an asset politically, and would mitigate divergence and cleavages within the NPT community. Some present NSG members are not there because of their immense supply potential, but because they belong to certain "Northern" organizations. I would regard it as slightly ironical if emerging suppliers with a real, significant potential

would be excluded for the sake of “manageability”. To start worrying about “manageability” briefly after the admission of the first few countries from the South, and at a time when it has become envisageable that, within the next decade, more nonaligned countries are likely to qualify, is not only disingenuous, it is bad politics. We should be prepared to expect between ten and twenty countries as mature candidates for the NSG within the next decade or so.

Moreover, the management problems posed by the more recent accessions are nil. It is the older members that appear to cause the major problems and controversies. And of course, “management problems” might be mitigated by making more extensive use of a tool already familiar to the NSG: the working group. Working groups with more limited membership could be tasked with preparing amendments to the guidelines and the annexes, while decisions would be taken, as usual, by the full plenary. In the extreme, only a chair could be elected by the Plenary on a consensus basis, and the chair would then be at liberty to pick “friends” for the preparation of a particular decision. Anyway, I regard it more likely that the NSG continues to grow while the skeptics are continuing to complain about “manageability”. In the end, the Group will find adequate generic or ad-hoc solutions to management problems as and when they appear.

V. Developing export control systems that are efficient in curbing dangerous trade and, at the same time, grant licenses to innocent transfers expeditiously and without undue delay is no easy task. It is not good enough to ask emerging suppliers to play by the rules. Within reasonable limits, assistance should be offered.

The type of assistance would vary with due regard to the needs and desires of the recipient. In some cases, legal advice or model regulations would be appropriate; the NSG might consider drafting a “blue book”, containing various models for domestic law and regulation, drawn from different approaches by its member states. Seconding staff or offering fellowships for custom agents and licensing officers could make sense. Company-to-company contacts with a view to help setting up intra-firm checks could make a tremendous contribution. Equipment and software would be most needed under certain circumstances. In extremes, modest financial assistance could be indispensable. It goes without saying that such assistance can only be offered; it is up to the emerging suppliers to take or not to take the offer. To the credit of suppliers, such assistance has been given in several cases.

For the NSG, it would be advisable to serve as a clearinghouse of both assistance already given (to avoid duplication) and of types of assistance available from member states. The Point of Contact could keep a “register” of assistance offers submitted by member states and could thus become a sort of a “broker” between countries asking for advice and those offering the needed type of assistance, and at very limited cost. Given the field of expertise, the NSG appears in a better position to do this than the IAEA, and no new administrative apparatus appears to be required for this task. This scheme could help in those cases where no bilateral channels are available.

VI. Relations between the NSG and non-members remains the cause of potential tension. We have witnessed the issue presenting a source of considerable conflict in previous review conferences as well as in the NPTREC of 1995. In this respect, the absence of major nonaligned leaders such as Nigeria, Mexico and Algeria, the latter two with significant peaceful nuclear activities, from this transparency exercise is quite regrettable.

Anyway, it should not prevent us from continuing this type of useful and substantial dialogue in the future. A continuing effort is recommendable to help the enlarged review process to proceed smoothly. More specific subjects such as transit, a much more detailed discussion of the content of the guidelines and the criteria for license decision - maybe even involving licensing simulation exercises - or, if countries are very courageous, a frank debate what went wrong with supplies to Iraq's clandestine nuclear weapon programs could, for example, be highly topical issues for further consideration.

In addition, the NSG might wish to consider whether, before a decision about amending the guidelines are taken, drafts are circulated among non-member countries to solicit comments. This could be done in written, with the request to submit comments to the Point of Contact at a given time. Or, it could be discussed at a seminar such as the present one. The Group could approach selected non-members, all NPT parties or all interested countries. There is no obvious choice among these alternatives, and the NSG might debate the pros and cons of each. But it strikes me that the gain in transparency and, indeed, cooperative dialogue would be considerable, while the administrative burden would be limited.

VII. Ambassador Patokallio has rightly emphasized the great importance of the People's Republic of China in this field. I share his concerns about the different reading by China of what appears to me as very straightforward language concerning full-scope safeguards as a condition of supply. I am even more worried by the absence of China as an active participant in this seminar. China, as all NPT parties present in 1995, has subscribed to Paragraph 17 of the Principles and Objectives asking for suppliers' transparency and a cooperative dialogue about supply policy among the adherents to the NPT. China may interpret her obligation as a supplier under the NPT differently than the majority, but it is very hard to understand why she would not be willing to use the excellent occasion of this seminar to exchange views, to present her policy principles and to answer questions that exist about the presence and future of her export policies. Many participants would have been interested in an elaboration of the recently adopted new regulations. We need China as a responsible and active supplier. The absence and silence is regrettable.

VIII. I have alluded to the "fifth group" of countries, the so-called "threshold" states. They are no doubt capable suppliers, but at the same time they are the main targets of present supply policies which puts them in an awkward position. So far, the record suggests that they behave rather responsibly in their own supply policies. Let me throw out a somewhat heretic thought here: would it be worthwhile to reconsider the strict application of the full-scope safeguards principle if, in turn, the three would offer some major concession in nonproliferation terms without fully acceding to the NPT? If, for example, a strictly verified fissile material cut-off was accepted by them, could this be a reason for the suppliers to relax, for example, supply conditions for light water reactor technology and fuel supply? I admit that I put forward this idea with great hesitation. I am fully aware how hard-fought and hard-won a principle full scope safeguards is, and I, for one, would not be willing to give it away on the cheap. I am also quite conscious that a cut-off that will - most likely - not require safeguards on existing stocks could mean, in principle, the equivalent of full-scope safeguards only to future, but not to past fissile material production. But the DPRK case has shown that one can consider applying this principle in an undogmatic way if the nonproliferation gain is seen worth the candle. And the three outsiders must be addressed, sooner or later, by the suppliers with an attempt to find new ways to draw them closer to the regime if present policies prove unsuccessful.

IX. In conclusion, I suggest we would be mistaken in believing that the future is the same as the past in all aspects. It appears that some major, basic work is still before the suppliers: the shape of a sensible catch-all clause, the definition of technology, the inclusion of services have not yet found a satisfactory solution. The issue of what degree of punishment is adequate for breaches of export control law, even the issue of extradition, has not adequately been tackled. How the Additional Protocol should figure in supply and NSG membership conditions - with due regard to the universality principle that requires the nuclear weapon states to apply the stipulations of the protocol in the fullest possible way - remains to be sorted out. The Guidelines will continue to be a "rolling text", rather than a holy book that cannot and must not afford change.

Most significantly, the process of creating mutual understanding between established suppliers, emerging suppliers, recipients and dispassionate observers has only started. It must be deepened if a serious and potentially very damaging rift among the adherents of the nonproliferation regime is to be healed; such deepening might occur at the global, regional, and bilateral levels. In this sense, this very interesting, substantial and promising meeting is not an end, but a beginning.

Biographical Information:

Dr Harald Müller has a very varied and distinguished academic career in international security, environmental and non-proliferation issues. His academic career has taken him to a number of centers of learning in the United States, Italy, and Belgium as well as his native Germany. Dr Müller is a member of the Core Group of the Programme for Promoting Nuclear Non-Proliferation (PPNN). Since 1989, he has been a member of the Working Group on Nonproliferation of the German Association for Foreign Policy. He was a member of the German delegation to the 1995 NPT Review and Extension Conference. Since 1996, Harald Müller has been Director of the Frankfurt Peace Research Institute. His extensive publications on security and non-proliferation issues includes some very thoughtful analyses of export control issues.

Commentary 2, Session 4

Mr Jan Hoekema, Former Chair of the Nuclear Suppliers Group and Member of Parliament, the Netherlands

I pay tribute to the chairman of this seminar, Mr. Abdul S. Minty, as a representative of a very special country so dear to the Netherlands. I thank the (many) organizers of this seminar and especially the permanent missions of Australia and Japan in Vienna.

It is an honour and a privilege for me to be invited to speak here on the future of export controls in international nuclear non-proliferation, and more in particular, to comment on Ambassador Patokallio's keynote speech. I am here as a former Chairman of the Nuclear Suppliers Group and convener of the first meeting of the 'Group' in 1991 after a long period of sleep in the 1980s. Seeing many familiar nuclear faces inside and outside this room, I am thoroughly reminded of a school or 'club' reunion. Be confident however that this is the first and last time I will refer to the NSG as a club, let alone the London Club. At present a Member of Parliament in the Netherlands, I am still very much interested in the problems regarding export controls. I come from an exporting country, a country also very much involved in transit business. The port of Rotterdam is the largest in the world and Schiphol is one of the world's biggest airports. They are both 'gateways to Europe.' That of course requires control on what is passed in transit there.

In theory, and on paper, all is well: the Netherlands themselves apply the strictest export controls but could get involved in nuclear transport, for example by means of a so-called re-routing of a shipment to a country of which there is no certainty that the nuclear material will come into reliable hands. The question here is whose responsibility is it to monitor such a re-routing? One could take the stand that the transit country is solely responsible for the routing of a shipment. It seems to me that that would not work. Any transporter using a variety of transit countries would then have an easy job of getting away with a suspect shipment. When, however, the exporting country remains responsible for the routing, a swindle with the routing would already be more difficult. We should, therefore, reach some form of shared responsibility for exporting and transiting countries instead of quarreling about it. End-use declarations and other instruments like information-alert mechanisms are required and to a great extent in place, but these may have their limitations. It is simply impossible to check all goods or means of transport in harbour or airport. We can send in trained dogs to airports to sniff at luggage, but we simply cannot open up containers at random. We therefore need an indication or clue to act upon.

Of course it is not always possible or easy to have a 100% check but as a rule controls are effective. 'Suspect' countries know by now that in Rotterdam they face a high risk of discovery and will try to get their shipment delivered by means of a more obscure route. Furthermore, there is a reason for the aggregate number of nuclear export license requests being denied only in 0.66% of all requests. I refer to the pie chart in Annex 3 of INFCIRC/539. Exporters usually know what can be approved and what not. Export control arrangements provide clarity and prevent improper exports from taking place. One should not forget that transits do not require authorisation or licensing.

Having said that, meanwhile, a great success of the NSG is that NSG Member States have their nuclear export control systems in order. And that certainty has not always been the case. Yesterday, Carlton Thorne put forward the history of the Zangger Committee and the NSG. We can certainly honour Professor Zangger and his Committee for interpreting the Non-Proliferation Treaty (NPT) in such a way that export control became a reality for the so-called especially designed or prepared equipment (EDP-goods). A disadvantage of that agreement was that the resulting trigger list was not completely comprehensive from a non-proliferation perspective.

The NSG was set up because a small number of countries found it desirable for non-proliferation purposes to go beyond the limited scope covered by the Zangger Committee. Limited, because its mandate only interprets Article III.2 of the NPT and the limited composition of its membership. This resulted - I run through history since Carlton Thorne has already gone into that yesterday - in the famous 1978 Guidelines which went as far as possible at the time. The NSG was reanimated in the early nineties and dual-use equipment was put under control. The Netherlands were glad to be instrumental in both. A disadvantage has always been that the NSG had a rather limited number of members. This is understandable, given the general mechanism: the larger the group, the more difficult it is to reach an agreement. To get the NSG really working, we needed a core group of countries. Nevertheless, the number of countries involved rose from the original 'seven sisters' meeting in London to 15 adherents to the first guidelines, 27 in 1991 to the present number of 35.

I have the feeling that today the right structure and the proper functioning of the NSG has been achieved. I would simply like to point out again the very limited number of nuclear export license denials and the preventive effect of the guidelines for them to occur. Whoever has bad intentions regarding nuclear proliferation understands that he or she should rather avoid NSG countries. This makes adherence of relevant exporting or transiting countries all the more important. Mr Patokallio referred to some of them like China and Kazakhstan. It is clear that we now must consolidate and further export the success of the NSG. The time that the NSG had something slightly mysterious or obscure is far, far behind us. Openness is now the rule, secrecy the exception. Membership could be granted to more countries. But expanding the NSG cannot and should not diminish its effectiveness. There must be a reasonable certainty that the new members have the capacity to control nuclear exports as members presently have.

The next step is to further promote transparency about nuclear export control matters, as required by the i.a. concluding document of the 1995 NPTRC. That is exactly why we are here. Furthermore, INFCIRC/539 is a sort of 'Everything you always wanted to know but were afraid to ask about the NSG.' Of course, the NSG must remain manageable, but that 'problem' - it is more a luxury - can be overcome. I think that NSG members have an obligation to assist countries asking for it, to get their export control legislation and practice right. The battle against the proliferation of nuclear weapons should be our common responsibility.

A new and final challenge is to merge Program 93+2 elements with the NSG Guidelines. Where up till now a Full Scope Safeguards Agreement with the IAEA was a condition of supply, in future a country should, in my view, be under the obligation to accept '93+2.' Full Scope Safeguards PLUS (FSS+). I think this is crucial. The NSG can and must expect its new members to adhere to it as well.

By the way: in retrospect, it has not been too easy to get all present NSG members to support '93+2.' We must be careful not to lose what we have achieved. I strongly believe that the NSG members should take the lead in adopting this programme and to encourage other countries to do the same.

It seems justified to conclude that the expansion of the NSG membership is a great opportunity for responsible non-proliferation policies through export controls, and that the new safeguard program can further guarantee its success. Not only to prevent the spread of nuclear weapons, but, and this should be our most important task as well, to let mankind take full advantage - in a responsible way - of the many peaceful applications of nuclear technology. Our venue of today, the IAEA's Board Room, testifies to this in a striking way.

Biographical Information:

Mr Jan Hoekema studied Political Sciences and Sociology before he joined the Ministry of Foreign Affairs in The Hague. After holding various positions in the Ministry he became Director for UN Political Affairs including disarmament, arms control and export controls in 1990. The same year, the NSG reconvened under his chairmanship in The Hague after a long period of dormancy. Since his election as a Member of Parliament in 1994, he has been spokesman for the Democrats 66 party on Defense and Security affairs and domestic affairs.



Chair's Closing Remarks

*Mr Abdul S. Minty, Chair of the Seminar
Chairperson, South African Council for the
Nonproliferation of Weapons of Mass Destruction and
Governor of South Africa to the IAEA*

I. General Comments

These remarks are not meant to be a comprehensive summary of the discussion over the past two days, but I would like to highlight a few points. The discussions have given us much to reflect on. As I already noted in my opening remarks all comments made by participants and by the keynote speakers and commentators should not be attributed to the individuals who made them. This does not apply to the written papers which were distributed.

My personal assessment of the discussion over the past two days is it has certainly fulfilled its prime purpose of creating more transparency about nuclear export controls and that it has done so within a framework of dialogue and cooperation between the participants. The information which has been provided has been of excellent quality with considerable depth and breadth and for this I must thank in particular the keynote speakers Drs. Blix and Heathcote, Mr Thorne, and Ambassador Patokallio. I also wish to thank the commentators who have made contributions of very high quality in a manner which has really enhanced the discussion and shed a great deal of light on an issue which has a record of being somewhat problematic. Thank you also to the participants for the spontaneous way in which they provided additional information during the course of making their remarks.

This seminar has provided real opportunities for experts and representatives from governments, industry and non governmental specialists to examine the full range of policy and implementation issues relevant to the role of nuclear export controls in nuclear non-proliferation and in nuclear trade.

It has been a positive and, above all, informative exchange, where I believe a number of misconceptions and misunderstandings have been able to be clarified. It is clear that this will be seen as an important, but not final step to promoting transparency within a framework of dialogue and cooperation on the role export controls. I will say more about this later.

II. Questions

A number of questions about the role of export controls in nuclear non-proliferation and their role in nuclear trade have been asked during the course of the last two days which are worth recalling here.

Equity

Do export controls inhibit the development of a peaceful nuclear program? How is this done, and if so, how can one overcome this? What other factors are at play that inhibit the development of such a program, such as the state of a nation's economic development, and

public acceptability of nuclear power? How far do export controls at times even work the other way around by fostering nuclear self-reliance?

Is export control implementation always based on objective, non-proliferation criteria or is it the case that the NSG countries at times implement the guidelines on recipients' future anticipated behaviour instead of their current record? How can this be addressed by suppliers? How can the concerns of recipients be satisfied?

Efficiency

How much can we rely on export controls as a guarantee against nuclear proliferation? Are they much more than a consultative filter mechanism? They can, no doubt slow down a proliferator's activities and make it more expensive.

Role of Export Controls and strengthened international verification

As the Additional Protocol safeguards agreements incorporates some of the elements of the export control guidelines, would broad-ranging adherence to the Additional Protocol ultimately reduce reliance on export controls? What other measures would be needed to create an effective network of verified legally binding non-proliferation commitments which would make it easier for states to concentrate on acquiring technology for peaceful economic development?

Should suppliers expand their requirement for full-scope safeguards as a condition of future nuclear supply to include adherence to the Additional Protocol? At what point should this occur?

Non-Proliferation Commitments

In the meantime, how do actual and potential suppliers ensure that they continue to observe their solemn commitment under the NPT and other international, legally-binding instruments in the field of nuclear non-proliferation?

On the other hand, is it not the case that supplier arrangements are not an end in themselves, but a guide to responsible national non-proliferation policies. Should we not acknowledge that some states not members of these treaties also exercise responsible export behaviour?

Illicit trafficking

How far should the prevention of illicit trafficking in nuclear materials remain a primarily national responsibility? Is there at least scope for greater cooperation between member states with relevant experience for increased cooperation with the IAEA in strengthening the capacity of states to combat illicit trafficking? Questions of transit and nuclear inheritance were also raised.

Observers and Membership

Can wider observer participation in the existing supplier groups contribute to the effectiveness of export controls? Would this contribute to greater understanding of export controls or in some circumstances generate more resentment?

Does adherence make sense without membership, given that there are several countries which are not members of supplier arrangements which behave responsibly in conformity with international and national obligations and policies? What alternatives are there to membership?

III. Ideas for future transparency, dialogue and cooperation

Seminars of this nature can contribute to a better understanding of the respective roles of both the NSG and Zangger Committee and the identification of areas where their operations could be better harmonised to avoid, among other things, duplication of effort.

Supplier arrangements need to respond to changing international circumstances, especially as an even greater number of states are gaining a capacity to supply. They will therefore need to develop new mechanisms to address this reality.

There is scope for further cooperation between members of supplier arrangements and non-members bilaterally, regionally, and multilaterally. Ideas for such cooperation that were raised include:

- more seminars, perhaps more focused at a regional level, and issue specific, e.g. transshipments issues, new and potential suppliers, means to prevent illicit trafficking in nuclear materials;
- practical assistance to non-members by members of supplier arrangements. Such assistance could be as simple as the provision of and briefing on national legislative and enforcement mechanisms, including for illicit trafficking. It might also include modest financial assistance, seconding staff or offering fellowships for customs agents and licensing officials;
- company to company contacts to help setting up intra-firm checks;
- prior consultations with a broader range of non-members before the Guidelines are amended, perhaps through a seminar or some other consultative mechanism;
- promoting dialogue between suppliers and recipients, including participation of recipients as observers in particular forums;
- encouraging all major suppliers to become members and rationalise the expanded size by generating proposals for changes to the Guidelines through smaller working groups which would be approved by a subsequent Plenary.

IV. Publication of Papers

There have been numerous requests for further written information about the role export controls play in nuclear non-proliferation and nuclear trade. In light of the very positive response to the papers presented at this seminar it is my view that it would be useful to ask the coordinators to discuss with the authors the possibility of preparing a publication of the papers presented over the past two days for wider distribution.

Vote of thanks

I would like to extend on behalf of all of us our heartfelt thanks to the speakers at this two-day seminar for the very valuable contribution they have made to this seminar and to transparency, dialogue and cooperation on the role export controls play in nuclear non-proliferation and nuclear trade.

Once again, I would also like to thank the Director-General of the IAEA, Dr Hans Blix, for making available the premises of the IAEA Board Room for the seminar and to his staff in the IAEA Secretariat led by Mr Kardos who have provided excellent assistance with logistic arrangements. The interpreters coped very well with technically complex subject material, and often without written texts, and we thank them for this.

I also thank again the NSG's Transparency Working Group and its chair Ms Martine Letts, as well as the program coordinator Mr Kees Nederlof of the Dutch Permanent Mission and the excellent staff of the NSG's Point of Contact at the Permanent Mission of Japan for the time and effort they have devoted to the organisation of the seminar. Much of the success of this meeting was critically dependent on the assistance they provided behind the scenes to all the participants and for this we owe them our particular gratitude.

Finally I thank you all for making this such a worthwhile exercise through your participation, contributions and comments. I hope that the constructive spirit in this room will continue outside in pursuit of our common transparency and non-proliferation objectives through dialogue and cooperation.

It has been a privilege and honour for me to chair this seminar. I has been an easy task thanks to your cooperation and assistance.

International Seminar

**THE ROLE OF EXPORT CONTROLS IN
NUCLEAR NON-PROLIFERATION**

IAEA Board Room, Vienna International Centre, Vienna, 7-8 October 1997

PROGRAMME

7 October 1997

Opening remarks: Mr Abdul S Minty, Chair of the Seminar

Chairperson, South African Council for the Nonproliferation of Weapons of Mass Destruction
and Governor of South Africa to the IAEA

Sessions 1, 2 and 3 will be followed by question and answer periods.

10:00 - 13:00

Session 1:
**The international nuclear
non-proliferation regime**

Keynote:

Dr Hans Blix
Director-General of the IAEA

Commentary:

Dr Fritz Schmidt
Chair of the Zangger Committee

Dr P Rama Rao
President, Indian Academy of Sciences
Chairman, Atomic Energy
Regulatory Board, India

13:00 - 15:00

Lunch break

15:00 - 18:00

Session 2
**The development of export
controls and their role in
nuclear non-proliferation**

Keynote:

Mr Carl Thorne
Former Chair of NSG Working Group
which created the Dual-Use Regime

Commentary:

Dr M.S. Ayatollahi
Permanent Representative of the
Islamic Republic of Iran to the IAEA

Ms Carmen Richter Ribeiro Moura
Division of Disarmament and Sensitive
Technologies (DDS), Ministry of External
Relations, Brazil

18:00

Reception for all participants, VIC restaurant

8 October 1997

10:00 - 12:00

Session 3

The practice of export controls: Effect on nuclear trade, how they work, and how they are implemented

Keynote:

Dr Roger Heathcote

IAEA Governor for the United Kingdom,
Director, Export Control and
Non-Proliferation, Department of Trade and
Industry, United Kingdom

Commentary:

Mr Toshiki Miyamoto

Chairman of the Nuclear Energy
Systems Steering Committee, Japan
Electrical Manufacturers' Association,
Senior Vice-President, Toshiba Corp.

Mr Freddy Sagala

Deputy Director General
for Administration of the National
Atomic Energy Agency, Indonesia

12:00 - 14:00

Lunch break

14:00 - 15:30

Session 4

The future of export controls in international nuclear non-proliferation

Keynote:

Ambassador Pasi Patokallio

Finland, Former Chair of the NSG

Commentary:

Dr Harald Müller

Head, Frankfurt Peace Research
Institute

Mr Jan Hoekema

Former Chair of the NSG
Member of Parliament,
the Netherlands

15:30 - 17:30

Panel Discussion

Keynote speakers and commentators

Closing remarks: Mr Abdul Minty, Chair of the Seminar

Annex 2

International Seminar on the Role of Export Controls in Nuclear Non-proliferation

7 & 8 October 1997
Vienna International Centre

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