"CONTROL OF NUCLEAR MATERIALS"

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1. INTRODUCTION

The Atomic Energy Control Board was established in 1946 pursuant to the provisions of the Atomic Energy Control Act which, in its preamble, states that the primary role of the Board is "... in the national interest to make provision for the control and supervision of the development, application and use of atomic energy and to enable Canada to participate effectively in measures of international control of atomic energy which may hereafter be agreed upon;...". The Act empowers the Board to make regulations respecting the control and licensing of atomic energy in particular and, more generally," ... as the Board may deem necessary for carrying out any of the provisions and purposes of the Act". The current Regulations were approved by Order-in-Council P.C. 1974 - 1195 and became effective June 3, 1974.

Bearing in mind that the Atomic Energy Control Act was passed in 1946, it is easily understood that the initial role of the Board was twofold:

1) to provide for the control and supervision of the development, application and peaceful use of atomic energy in Canada; and

2) to enable Canada to participate effectively in measures of international control.

Over the last several years, the Canadian public has developed a very appreciable awareness of the implications of nuclear energy insofar as nuclear safety and the potential for nuclear weapon proliferation are concerned. Other speakers at this Seminar have identified many of the issues of current interest and have outlined the steps that have been undertaken to resolve some of these issues. The purpose of this paper is to summarize the developments that have taken place over the last thirty years insofar as international measures for the control of nuclear energy are concerned.

2. HISTORICAL REVIEW

In 1945 a single "atomic" bomb destroyed a large part of the City of Hiroshima and caused hundreds of thousands of casualties. A second bomb subsequently destroyed most of Nagasaki. Since then, increases in the number and destructive capability of nuclear weapons as well as in the number of countries which possess such weapons have created the risk that human life could be wiped out or at least substantially reduced should a major war break out. In the 31 years that have elapsed since Hiroshima the world has never been completely at peace, but it has somehow managed to avoid the use of nuclear weapons. It would appear that Albert Einstein was correct, at least in part, when he stated in 1945:

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"Since I do not foresee that atomic energy is to be a great boon for a long time, I have to say that for the present it is a menace. Perhaps it is well that it should be. It may intimidate the human race into bringing order into its international affairs, which, without the pressure of fear, it would not do."

Early optimism about the establishment of an effective system of international control of nuclear energy was aroused in January, 1946 when the United Nations General Assembly approved without a dissenting vote a proposal to set up a United Nations Atomic Energy Commission. However, in the difficult months that followed, the United States and the Union of Soviet Socialist Republics were unable to reach accord on the measures to be taken and the proposal disappeared into the pages of history.

Fortunately, a number of countries diligently pursued the matter and on October 23, 1956 the Statute of the International Atomic Energy Agency (IAEA) was approved by the United Nations. The Statute entered into force on July 29, 1957. Not unexpectedly, the Canadian Government played an important role in promoting worldwide support for the establishment of the IAEA and has continued to pursue a policy of non-proliferation as, for example, by its membership in the Eighteen Nation Disarmament Committee which drafted the Treaty on the Non-Proliferation of Nuclear Weapons (NPT). The purpose and provisions of the NPT are outlined later in this paper.

3. THE INTERNATIONAL ATOMIC ENERGY AGENCY (IAEA)

As stated earlier, the IAEA came into existence on July 29, 1957 as a member of the family of United Nations organizations. Article II of the Agency's Statute sets forth its objectives as follows:

"The Agency shall seek to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world. It shall ensure, so far as it is able, that assistance provided by it or at its request or under its supervision or control is not used in such a way as to further any military purpose."

To-day, the IAEA has 109 Member States who meet annually in what is known as the "General Conference". During each General Conference a Board of Governors is elected which includes the members most advanced in the nuclear field and members which represent the interests of countries in all areas of the world. The Board of Governors has the authority to carry out the functions of the Agency in accordance with the provisions of the Statute.
In pursuing its first objective to promote the peaceful uses of atomic energy, the Agency has undertaken a wide spectrum of activities including the very important function of expanding the international exchange of information. With respect to nuclear power, the Agency maintains a small expert staff which furnishes advisory services to Member States on the economics of the use of nuclear power and on criteria, codes and guides for the siting, design and operation of nuclear power stations. Similarly, the Agency promotes the use of isotopes in industry, agriculture and medicine.

The second fundamental objective of the Agency is most commonly known as its "safeguards" objective. Article III of the Statute requires the Agency, inter alia, "To establish and administer safeguards designed to ensure that special fissionable and other materials, services, equipment, facilities and information made available by the Agency or at its request or under its supervision or control are not used in such a way as to further any military purpose; and to apply safeguards, at the request of the parties to any bilateral or multilateral arrangement, or at the request of a State, to any of that State's activities in the field of atomic energy". In 1961, the Agency adopted a system of safeguards for research reactors. It extended this system in 1963 to power reactors and, following two years of lengthy technical meetings it adopted an expanded system which was applicable to nuclear facilities generally and research and power reactors in particular. The 1965 system was outlined in a document entitled "INFORMATION CIRCULAR/66" which was subsequently revised in 1966 and again in 1968 to provide more explicit guidance on the safeguarding of uranium conversion, fabrication and reprocessing plants.

The Treaty on the Non-Proliferation of Nuclear Weapons which was opened for signature in 1968 and which entered into force in 1970 added a new dimension to the safeguards role of the Agency because of the more comprehensive obligations undertaken by States which have ratified the Treaty. In 1970, the Agency's Board of Governors established a special committee, the membership of which was open to all IAEA Member States, to prepare a set of recommendations governing the safeguards measures to be applied pursuant to the provisions of the NPT. The committee met throughout 1970 and 1971 and submitted its recommendations in the form of a report entitled "The Structure and Content of Agreements Between the Agency and States Required in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons" (INFCIRC/153).

The provisions of INFCIRC/153 are designed to take advantage of the fact that all of the nuclear material in a state which has ratified the NPT is subject to safeguards. Rather than being directed at specific facilities, the safeguards measures implemented by the Agency under INFCIRC/153 are applied at those stages of the entire nuclear fuel cycle where nuclear material is in such a form as to facilitate its diversion to the manufacture of nuclear explosive devices. It is the task of the Agency's Department of Safeguards and Inspection to implement these measures. The Department has a total staff of about 140 persons of whom about one-half are university trained and is divided into two divisions (the Operations Division...
and the Development Division). Inspectors in the Operations Division evaluate design and operating information on nuclear facilities subject to safeguards to ensure that they are fully conversant with those aspects of importance to safeguards review accountability data and perform on-site surveillance and physical inventory functions. The staff of the Development Division administer a comprehensive research and development program designed to ensure the availability of effective procedures, equipment and techniques which will enable the Agency to achieve its technical objective of ensuring "the timely detection of diversion of significant quantities of nuclear material from peaceful nuclear activities to the manufacture of nuclear weapons or of other nuclear explosive devices or for purposes unknown, and the deterrence of such diversion by the risk of early detection".

4. THE TREATY ON THE NON-PROLIFERATION OF NUCLEAR WEAPONS (NPT)

The Treaty on the Non-Proliferation of Nuclear Weapons (NPT) consists of a set of comprehensive undertakings on the part of states which ratify the Treaty. These undertakings may be summarized as follows:

1) to achieve at the earliest possible date the cessation of the nuclear arms race, to initiate effective measures in the direction of nuclear disarmament, and eventually, to negotiate a treaty on general and complete disarmament "under strict and effective international control";

2) to co-operate in facilitating the application of IAEA safeguards on peaceful nuclear activities;

3) to promote international cooperation in developing the peaceful uses of nuclear energy, and particularly to help developing countries in this regard; and

4) to afford all parties whatever benefits may be derived from the peaceful uses of nuclear explosions.

Although the Treaty does not say so explicitly, it is generally accepted that the obligation to achieve a cessation of the nuclear arms race and general disarmament falls primarily upon those parties to the Treaty that are "nuclear weapon states".

The second undertaking stated above, that is to facilitate the application of IAEA safeguards on peaceful nuclear activities, requires "non-nuclear weapon states" to accept safeguards, as set forth in an agreement to be negotiated and concluded with the IAEA on the basis of the previously mentioned document INFCIRC/153, "for the exclusive purpose of ............ preventing diversion of nuclear energy from peaceful uses to nuclear weapons or other nuclear explosive devices.....". Nuclear weapon states are not required to accept the application of IAEA safeguards on their non-military programs. However, the United Kingdom and the United States of America have agreed to accept such safeguards to counter criticism that their nuclear power programs do not have to carry the "burden" of international inspection.
The undertaking to promote international cooperation in the peaceful uses of nuclear energy is of course consistent with one of the two fundamental objectives of the IAEA. Thus, notwithstanding the efforts of individual states to assist developing countries on a bilateral or multi-lateral basis, many of the parties to the NPT are of the view that a collective effort by all states could best be achieved by strengthening the IAEA's existing and planned programs. At present, the four IAEA programs of particular relevance are:

1) technical assistance and other forms of technical cooperation;

2) development of internationally accepted nuclear safety criteria and standards;

3) consultancy services; and

4) information exchange, particularly by means of conferences, symposia and document distribution.

The fourth undertaking, although seemingly part of the third, is treated quite separately because of its special nature and in view of the fact that many states such as Canada have made it clear that they do not distinguish between a peaceful nuclear explosion capability and a nuclear weapon capability. Four of the five recognized nuclear weapon states are Members of the IAEA, three have ratified the Treaty, two have not pursued any substantial peaceful nuclear explosive program and only one is currently pursuing a significant program. This suggests that there is at least some doubt as to what are, in fact, the benefits to be derived at present or in the near future from the peaceful uses of nuclear explosions.

Since the NPT entered into force in 1970, a majority of IAEA Member States have ratified the Treaty and have concluded the required safeguards agreements with the Agency. However, a significant number of both industrialized and non-industrialized states have elected not to ratify the Treaty thus placing a heavy responsibility on countries which are major suppliers of nuclear materials and equipment. Canadian Government policies have traditionally placed us in the vanguard of safeguards applied by nuclear suppliers. In December 1974, the Government announced its decision to require additional, very stringent safeguards measures in respect of the export of nuclear technology, facilities and materials. To the extent that these safeguards requirements go beyond the provisions of the NPT and of IAEA safeguards agreements, a degree of bilateral verification is necessary. This verification function is performed by AECB inspectors pursuant to the terms of agreements entered into with importing countries.
It is evident that Canada will continue to support initiatives currently underway within the IAEA aimed at reducing the risk of nuclear weapons proliferation. These initiatives include efforts to achieve a wider acceptance of the NPT, the development of improved safeguards measures, the strengthening of the IAEA's Department of Safeguards and Inspection by means of additional human and other resources and a number of related activities such as the adoption of rigorous controls for the physical protection of nuclear materials and facilities.