

ready for negotiation

The Treaty on the Non-Proliferation of Nuclear Weapons — the NPT — came into force on 5 March 1970, just over a year ago. Each country not having nuclear weapons — each non-nuclear weapon State — that ratifies the Treaty will conclude an agreement with the IAEA under which safeguards will be applied to all nuclear material in all its peaceful nuclear activities. According to the Treaty, these safeguards will have the aim of verifying that there is no diversion of nuclear material from peaceful uses to nuclear weapons or other nuclear explosive devices.

By 5 March 1971, 63 non-nuclear weapon States and three nuclear weapon States (the Soviet Union, the United Kingdom and the United States) had ratified the Treaty. A further 33 non-nuclear weapon countries had signed it, that is, taken the first step toward ratification.

Safeguards agreements with the IAEA must be concluded by the end of February next year by most of the non-nuclear weapon countries which have ratified the Treaty. Last year, therefore, the Board set up a committee open to all Member States of the Agency to advise it as a matter of priority on the content of these agreements. Later, the Board also asked the committee to study the question of meeting the cost of safeguards.

The committee began its work in June 1970, and nearly 50 Member States took part. On 10 March, after 82 meetings, the committee completed its work.

The Board has given authority to the Director General of the IAEA to use the committee's recommendations as the basis for negotiations with non-nuclear weapon States Party to the NPT, and many of them have already started their negotiations with the Agency. The Board has also agreed that the results of the committee's recommendations on the financing of safeguards should be taken into account in the scale of contributions of Member States to be considered by the Agency's General Conference in September this year.

The results of the first series of meetings of the Safeguards Committee were reported by its Chairman, Dr. Kurt Waldheim, and recorded in Volume 12 No. 4 of the Bulletin in August 1970. In autumn last year the committee met under the chairmanship of Professor J. A. K. Quartey, of Ghana; from the beginning of this year the chair was taken by Academician Brúnó Straub, of Hungary, who gave a report on the committee's work at a press briefing in early February. At that time, Academician Straub was able to say that the committee had been successful in finding workable compromises on the many complex legal and technical questions it had had to deal with. On every difficult point, it had been possible to reach a consensus without taking a vote.

The committee has recommended that the agreements with non-nuclear weapon States should consist of two parts. The first should contain clauses dealing with the basic legal, financial and administrative obligations of the State and the Agency as well as certain general technical guidelines, and the second part should specify in detail the technical safeguards procedures to be followed.

This article gives a summary of the main recommendations made by the Safeguards Committee; it is not an official record.

The consensus: the first part

In accordance with Article III.1 of the NPT, safeguards should be applied on all nuclear material in peaceful nuclear activities for the sole purpose of verifying that the material is not diverted to nuclear weapons or other nuclear explosives.

These safeguards should be so applied as to avoid hampering national or international economic and technical development, to minimize interference in the country's peaceful nuclear activities and to conform with prudent management practices.

Again, in accordance with the NPT, safeguards should be applied so as to take full account of new safeguards techniques. The Agency should make every effort to ensure optimum cost effectiveness in the application of safeguards by use of instruments and other techniques at certain "strategic points" to the extent that present or future technology permits.

An important recommendation is that the country concerned should set up its own system of accounts and control of nuclear material. Safeguards should be applied in such a way as to enable the Agency to verify, in ascertaining that there is no diversion, the findings of the State's own system. For this verification, the Agency would make independent measurements and observations.

The Agency should take every precaution to protect any confidential industrial or commercial information that it may gain in applying safe-

guards. The State need give the Agency only such information as is essential to apply safeguards effectively.

It should be entirely within the State's discretion to agree to the accreditation of a particular inspector, and this agreement may be withdrawn at any time. However, provision should be made for appropriate action if a State were repeatedly to refuse designations proposed by the Agency.

Safeguards should terminate when nuclear material is exported from the State, and when the importing State accepts responsibility for the material.

The NPT does not proscribe military "non-explosive" uses of nuclear energy (for example, for ship propulsion), but a State planning to engage in any such non-proscribed military activity should be required to show that the material to be used for it is not subject to a "peaceful use only" requirement (material supplied through the Agency and most material supplied, for example, under bilateral or State-to-State agreements cannot be used for *any* military purpose).

With regard to finance, the State and the Agency should each bear the costs that it incurs in carrying out the agreement, in the case when the State is a member of the Agency. For the few States that are not members special reimbursement arrangements are foreseen.

The agreement should also include clauses to cover the Agency and its officers with regard to claims arising in the event of a nuclear incident. Other claims would be settled in accordance with international law.

The normal procedure for settling disputes that could not be dealt with in consultations or by recourse to the Board of Governors should be by arbitration. The decisions taken by the arbiters would be binding upon both State and the Agency.

If, after careful examination, the Board were to conclude that the Agency was not able to verify the absence of diversion, the Board might then take various actions foreseen in the Agency's Statute. These include reports to the General Assembly and the Security Council of the United Nations. Every reasonable opportunity should, of course, be given to the State to provide all necessary reassurances before such action is taken.

The second part

All safeguards involve four elements:

- essential information ("design information") about the layout and features of the plant that are relevant from a safeguards point of view must be made available to the safeguarding authority and kept up to date;
- the plant operator keeps records of all significant movements of nuclear material as well as of the operation of his plant. He must do this in any case for economic and safety reasons;
- based on these records, reports shall be submitted to the Agency;

- and the safeguarding authority must have the right to send inspectors to verify the correctness of the information reported to it and to provide assurance that there is not diversion.

In most nuclear operations, as in other industrial operations where material passes through a series of processes, there are bound to be some unaccounted losses or gains as the material moves from one stage to another. The amount of "material unaccounted for" over a given period may vary from the minute to the significant. The technical aim of safeguards is therefore to be able to state how much material is unaccounted for over a given time, and in a given part of the plant, and to be able to say with what degree of precision this statement is made. If the loss or gain is excessive, steps must be taken to find out the reason. Thus a distinction may be drawn between routine safeguards operations and those that are necessary in special cases.

The recommendations of the committee regarding Part II are set forth in 90 clauses which spell out in detail the technical procedures to be followed in applying the first part.

Having stated the objective of safeguards, the second part of the committee's recommendations describes the main elements of the State's own national accounts and control system, of which the Agency should make full use.

The committee recommends that the starting point for the application of safeguards should be set at the stage in the fuel cycle when the material reaches such purity and composition as to make it suitable for fabrication into nuclear fuel or putting into an enrichment facility. However, the State should inform the Agency of exports to other non-nuclear weapon countries and of imports of nuclear material that have not reached this stage of refinement.

To specify the way in which the safeguards would be applied in individual plants and to deal with other matters of detail, there should be "subsidiary arrangements" to be completed at the same time, or soon after the agreement itself comes into force.

Safeguards would normally first be applied on the basis of an initial report of all relevant nuclear material in the country. This report would enable the Agency to establish a single inventory, irrespective of the origin of the material.

The second part of the Committee's recommendations then deal with the four main elements of safeguarding mentioned above: design information; records; reports; inspections.

Several recommendations specify the type of design information to be given to the Agency and the purposes for which it is to be used. A basic concept for applying safeguards should be the "material balance area". This is a defined area in the plant or elsewhere used for accounting purposes. All nuclear material moving in or out of this area is measured at selected "key measurement" or other strategic points. If the State so wishes, a special material balance area should be established around a particular part of the plant where there is a process step involving commercially sensitive information.

The committee's recommendations then proceed to describe in detail the records to be kept for each material balance area and the reports to be made to the Agency. A system of periodic reports is foreseen, giving changes in the amount of material in each material balance area,

as well as a report when an inventory is taken. The reports would be based on "book entries" and the inventory reports would be based on actual physical measurements. Special reports are foreseen in the event of unusual circumstance.

Three broad categories of inspections are discerned:

- *"Ad hoc" inspections*, for example to check the first report that the State sends in, or before the export or after the import of material;
- *Routine inspections* (limited to strategic points and records);
- *Special inspections* to verify special reports and in cases where information obtained in routine inspections is not adequate for the Agency to fulfil its responsibilities.

There should be immediate consultations between the State and the Agency in any circumstances that might lead to a special inspection. Inspectors would then, with the agreement of the State, have access additional to that foreseen for routine or "ad hoc" inspections. Provision is made for resolving any difficulties that may arise with regard to such access.

The committee has also made recommendations about the maximum amount of routine inspection that may be devoted to various types of plant, taking into account the amount of material involved and its degree of enrichment. It then recommends criteria to be used in determining the *actual* amount of inspections; for instance, the effectiveness of the State's accounting and control system, the characteristics of its fuel cycle and the degree to which the latter is self-contained or internationally interdependent.

Detailed recommendations are made about the procedures for accrediting inspectors and about the way in which inspectors should carry out their duties. The Agency would also be required to inform the State of the conclusions it draws from its verification activities.

Finally, it is recommended that the agreement should define the point at which nuclear material would be regarded as passing into or out of the State's responsibility. Notifications of export should be made after contracts have been concluded so that no commercial interests need be affected and exports should not be delayed by any action of the Agency. The State should, however, make special reports in the event of loss or suspected loss of nuclear material exported or imported.

These, then, are the main recommendations of the committee, endorsed by the Board as a basis for negotiation.

Financing safeguards

The committee also spent much effort in devising a broadly acceptable recommendation for financing safeguards. Briefly, its recommendation is that the Agency's safeguards costs should continue to be met from its regular budget but that the method of assessing them should be adjusted to take account of the position of countries with lower per capita incomes. These recommendations will affect the scale of budgetary contributions which must be set by the General Conference. This scale will be considered by the General Conference in September this year.

Safeguards in nuclear weapon States

The United States has offered to permit the Agency, when safeguards are applied in non-nuclear weapon States pursuant to the NPT, to apply its safeguards in all nuclear activities in the US, excluding only those having direct national security significance. The United Kingdom has made a similar offer. The committee considered also certain of the financial aspects of these offers. Consultations will take place shortly with the Governments of these countries regarding the content of the agreements to be concluded with the Agency.

An article explaining some of the background to the work of the committee and discussing the philosophy of safeguards, by Mr. Myron B. Kratzer, assistant general manager for International Activities, US Atomic Energy Commission, was published in the February 1971 issue of "Nuclear News".