

# Strengthening the international safeguards system

*An overview of proposals to further improve the effectiveness and efficiency of the IAEA's safeguards system*

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The safeguards programme of the IAEA continues to be influenced by a wide range of international developments. During the past year, IAEA Member States collectively reaffirmed their commitment to the Agency's objective of seeking to accelerate and to enlarge the contribution of atomic energy to peace, health, and prosperity throughout the world while ensuring that such a contribution is not used in any way to further any military purpose.

This commitment was reinforced through actions by individual Member States. The decision by the Governments of Argentina and Brazil to develop a bilateral safeguards agreement under which the two countries would carry out safeguards inspections jointly and to implement a safeguards arrangement with the IAEA under which all of the peaceful nuclear activities of the two countries would become subject to IAEA safeguards has been widely acclaimed. Similarly the decision by South Africa to ratify the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) and its signature of a comprehensive safeguards agreement with the IAEA in record short time were important steps in the further extension of international safeguards. More recently the adherence of China to the NPT is considered to be a further important international contribution to the non-proliferation regime.

These and other international developments will undoubtedly continue to influence the evolutionary improvements in the IAEA safeguards programme, as they have since its inauguration three decades ago.

The basic principles on which IAEA safeguards have been developed during the past three decades have remained essentially un-

changed. However, the recent demands by Member States for improvements in effectiveness and efficiency have emphasized the greater urgency which they now attach to the achievement of further optimization of safeguards criteria and procedures.

It is the Secretariat's view that the impressive increases in safeguards effectiveness and efficiency that have been achieved during the past decade through Member State contributions, technological advances, and lessons learned from experience justify optimism regarding further improvements of the safeguards system. Regardless of the precise direction in which efforts to improve the cost-effectiveness of Agency safeguards proceed, it is clear that the contributions of Member States, and particularly those which have established safeguards support programmes, will be of primary importance.

Superimposed over the continuing interest of Member States in the further optimization of IAEA safeguards is the fact that the technical effectiveness of safeguards has come under close scrutiny. This is a result of the revelations from activities undertaken by the IAEA in Iraq pursuant to United Nations Security Council Resolution 687.

Iraq's non-compliance with the provisions of its safeguards agreement with the IAEA, and the magnitude of its undeclared nuclear-weapon development programme, has forcefully underlined the fact that the safeguards assurances presently provided by the IAEA through nuclear material accountancy verification activities at declared facilities alone are insufficient. They must be complemented and strengthened by activities providing equivalent assurances that undeclared nuclear material and nuclear facilities do not exist in States which have entered into comprehensive safeguards agreements with the IAEA. How these additional assurances can be developed is under careful consideration by the IAEA and its Member States.

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In accordance with its statutory mandate, the IAEA Board of Governors has consistently assigned high priority to the evolutionary development of the IAEA's safeguards system. This is evident from the Board's continuing efforts to monitor and to evaluate the extent to which the Secretariat has achieved the IAEA's safeguards objectives. The Board's extensive consideration of annual reports on safeguards is but one example of the careful scrutiny applied to safeguards activities.

During the past year, the Board devoted appreciable time to the consideration of various proposals put forth by the Secretariat. These proposals and the status of the Board's current consideration of them are outlined in this article.

During its 24-26 February 1992 meetings, the Board deliberated upon proposals regarding:

- the use of special inspections;
- the early submission of information about plans to construct new nuclear facilities;
- the reporting and verification of the production, export and import of nuclear material; and similarly,
- the reporting and verification of the export and import of equipment and materials specially intended for use in nuclear activities.

### Special inspections

With respect to the matter of special inspections, the Board reaffirmed the IAEA's right to undertake special inspections in States with comprehensive safeguards agreements, when necessary and appropriate, and to ensure that all nuclear materials in all peaceful nuclear activities are under safeguards. The legal basis for the IAEA's right to conduct special inspections is set out in safeguards agreements concluded pursuant to documents INFCIRC/66 and 153.

Comprehensive safeguards agreements such as those concluded pursuant to INFCIRC/153 include an obligation for the State to accept safeguards on all source and special fissionable materials in all peaceful nuclear activities within its territory, under its jurisdiction or carried out under its control anywhere. Under those agreements, the IAEA has the right and the obligation to ensure effective application of safeguards in conformity with the commitments undertaken by the State in question. The agreements make no distinction between declared and undeclared material. One of the IAEA's obligations is thus to ensure that all materials subject to safeguards are in fact safeguarded.

It is not expected that special inspections will occur very frequently but the fact that they are performed will provide important additional

safeguards assurances. These additional assurances may be the result of special inspections undertaken on the IAEA's initiative. States might also wish to take advantage of the special inspection procedure and invite the Agency to conduct such an inspection.

### Provision of additional information

The Board further reaffirmed the IAEA's rights to obtain and to have access to additional information and locations in accordance with the IAEA Statute and all comprehensive safeguards agreements.

This action by the Board was taken in recognition of the fact that one important element of any system established to detect the existence of undeclared nuclear activities is information. If a State conceals some of its nuclear activities, the IAEA must have access to information indicating this concealment and thereby establish a basis for pursuing its verification activities. More extensive use and evaluation of available information may make apparent inconsistencies between such information and the State's declared nuclear activities.

There appears to exist a wide consensus that such a process would also contribute to the IAEA's capability to detect the existence of undeclared nuclear activities much earlier than through the present system based on nuclear material accountancy.

In implementing this additional capability, the Secretariat has the very responsible task of carefully evaluating all available information and judging the follow-up actions to be taken. Anomalies and inconsistencies might prompt a number of actions, including the authorization of the conduct of additional safeguards measures such as special inspections. One essential action would involve early consultation with the State concerned and this alone might bring about any necessary explanation or corrective measure. One additional advantage of the improved capability of the IAEA to detect undeclared nuclear activities would be that through its existence any possible intent to enter into a nuclear-weapon development programme might be deterred at an earlier stage.

During its February 1992 meetings, the Board called on parties to comprehensive safeguards agreements to provide preliminary information on programmes for new nuclear facilities and activities, as well as modifications to existing facilities, as soon as the decision to construct, to authorize construction, or to modify a facility has been taken. This information would be updated during project phases of definition,

preliminary design, construction, and commissioning.

The IAEA has several sources of information about nuclear activities in States having comprehensive safeguards agreements.

The first and perhaps most important are the declarations by the State regarding such activities and the various nuclear material accounting reports which it submits in accordance with the provisions of its comprehensive safeguards agreement. These reports include what are known as material balance reports, physical inventory listings, reports on the results of physical inventory measurements and evaluations made by nuclear facility operators, and reports on domestic transfers as well as on the export and import of nuclear material.

The second important source of information are the reports sent to the IAEA by other States which have entered into nuclear co-operation

arrangements with the State in question. These reports include information on the export of nuclear material, thereby providing the IAEA with a means of confirming the correctness and completeness of reports on imports submitted by the State.

A third source, which at the present time is not very extensive, is information which could be provided by Member States on the export and import of certain equipment and non-nuclear materials which are used in the nuclear field. The provision of such information will assist the IAEA to confirm the correctness and completeness of its knowledge about the scope of nuclear activities in a given State.

The fourth possible source of information which would be useful to the IAEA in assessing the possible existence of undeclared nuclear activities in a State is the provision of information on equipment, facilities and testing programmes which could be related to the conduct of activities not previously declared by a State. Information in the international technical literature and in media reports sometimes provides a hint of nuclear activities which were previously unknown.

Fifthly, there are other valuable sources of information, including the databases maintained by other organizations, both national and international, such as the Uranium Institute, the Nuclear Assurance Corporation, the Monterey Institute of International Studies, and the Stockholm International Peace Research Institute.

Information provided by Member States will need to be treated carefully and where necessary confidentially. Strict confidentiality is maintained by the Secretariat with respect to what is known as "safeguards confidential" information and this practice will of course be continued.

The evaluation of the information outlined above to enable the Agency to develop a more comprehensive understanding of a State's nuclear activities will be the *sine qua non* of the IAEA's enhanced capability to ensure a full and timely awareness of such activities.

Such an "early warning" system would likely consist of four parts:

- information gathering;
- information evaluation and analysis;
- information confirmation or non-confirmation; and
- information dissemination.

As stated earlier, there appears to exist a wide consensus that the IAEA should use all information available to it to monitor continuously the nuclear activities in non-nuclear weapons States party to the NPT for confirmation of the completeness and correctness of the State's declaration regarding its nuclear programme. This is

As part of verification activities, records of safeguarded nuclear material are checked by IAEA inspectors.



more easily said than accomplished. The expectation is that by carefully monitoring and analyzing all information, the risk that clandestine nuclear activities would remain undetected would be considerably reduced. A high degree of transparency in peaceful nuclear energy programmes could be achieved which would provide additional confidence of the non-existence of non-peaceful nuclear activities in such States.

The cost-effectiveness of the early warning system needs to be evaluated. Certainly, the system will not be more reliable or credible than the available sources of information. The potential costs are difficult to predict, changes in national regulation and legislation might become necessary, and the introduction of additional international legal instruments (e.g., protocols) may be necessary. However, the proposed improvements would certainly enhance the effectiveness and credibility of safeguards, which justifies the additional effort.

### **Reporting and verification of production, export, and import of nuclear material**

Safeguards agreements provide only for reporting of the export and import of certain nuclear material. Expansion of the existing requirements for nuclear material reporting to all nuclear material in all peaceful activities would provide assurance that such nuclear material as is not currently subject to reporting is used in accordance with a State's basic undertakings under a safeguards agreement.

Thus, the Secretariat proposed that, regardless of whether or not they fall within current reporting requirements, all imports and exports of nuclear material be reported, with the exception of nuclear material in military activities and some minor quantities in non-nuclear use.

Furthermore, the Secretariat also proposed that the initial inventory of a State with a safeguards agreement should include all nuclear material which is in peaceful nuclear and non-nuclear use, starting with ore concentrate and including material which has not reached a composition and purity suitable for fuel fabrication or isotopic enrichment. Once included in the inventory, the material in non-nuclear use thereafter could be exempted from safeguards, or the safeguards on it could be terminated, in accordance with the provisions of the safeguards agreement.

In its preliminary consideration of these proposals, the IAEA Board of Governors noted that although their acceptance would provide the IAEA with greater assurance regarding the quantities, use, and location of all nuclear material in

a State, a number of legal, technical, and economic factors required further study in order to determine the practicability and the value of the additional reporting. As a consequence, the Board decided to continue its consideration of the proposals during its June 1992 meetings.

### **Reporting and verification of the export and import of certain equipment and non-nuclear material**

Reporting by all States on the export and import of certain equipment and non-nuclear material would provide a greater measure of openness about nuclear activities. Hence, it would contribute to confidence in the peaceful use of such equipment and material, as well as associated nuclear material.

The Secretariat proposed to the IAEA Board that the IAEA establish a list of equipment and non-nuclear material especially designed or prepared for the processing, use, or production of special fissionable material that would be used by all States in reporting the export and import of such equipment and non-nuclear material. The IAEA would consolidate and study these reports with a view to checking that the equipment and material are actually located and used as declared. The record of exports and imports would be treated as "safeguards confidential" information to protect any commercially or industrially sensitive information which it might contain.

The Board of Governors gave only preliminary consideration to the proposals regarding export and import of certain equipment and non-nuclear material. It identified a number of factors which would prevent States from undertaking the full range of reporting requirements included in the Secretariat's proposals and similarly noted that the related verification measures might not be feasible or cost effective. As a consequence, the Board decided that it would continue its consideration of this subject during its June 1992 meetings.

### **Accelerated development of safeguards**

The year 1991 proved to be an exceptional one for the IAEA's safeguards programme. This was largely a result of the actions by the United Nations Security Council requesting the IAEA to undertake a number of responsibilities in Iraq pursuant to the provisions of Security Council Resolutions 687, 707, and 715.

However, months before these additional responsibilities were undertaken, the Board of Governors had requested the Secretariat to pur-

sue a fundamental review of safeguards principles, criteria, and procedures in order to ensure that the IAEA would be able to cope with the increasing demands expected to be placed upon it during the 1990s. A number of safeguards matters were raised during the 1990 NPT Review Conference in Geneva and these matters prompted a great deal of thought by the Secretariat and Member States. A greater awareness of the problem posed by possible clandestine nuclear activities quickly led to proposals regarding additional measures which might be introduced.

The IAEA safeguards system has evolved very significantly since the publication in 1961 of its first Safeguards Document. However, events of 1991 made it clear that the evolutionary development of safeguards approaches needs acceleration. Additional safeguards measures necessary to provide assurance that undeclared nuclear material and nuclear facilities do not exist in States which have entered into comprehensive safeguards agreements must be introduced at an early date. Substantive progress has been made in considering various additional safeguards measures. This progress is the result of a co-ordinated effort involving Member States, international consultants, the Standing Advisory Group on Safeguards Implementation (SAGSI), and the Secretariat.

Needless to say, such a wide-ranging review, extending to the whole spectrum of non-proliferation issues, may sometimes lead to the expression of different views as to the desired extent and rigour of the measures to be applied. However, the desire to reach an effective and workable consensus is undoubtedly present in all discussions.

The reaffirmation by the Board of Governors of the IAEA's right to undertake special inspections in Member States with comprehensive safeguards agreements and to ensure that all nuclear materials in peaceful nuclear activities in the States are safeguarded was an important step towards the desired strengthening of IAEA safeguards. Similarly, the Board's decision to call on parties to comprehensive safeguards agreements to provide preliminary information as early as possible on plans for the construction of new nuclear facilities are an essential improvement of the basis upon which the Secretariat initiates the many and varied activities forming the IAEA's safeguards system. Perhaps more importantly, it is now widely recognized that the early submission of information to the IAEA on nuclear activities in Member States, and to the extent possible its public disclosure by the State, will provide added assurance to all

Member States of the peaceful intent of such programmes.

Although the Board of Governors was only able to give preliminary consideration to Secretariat proposals regarding the reporting of the export and import of nuclear material and of certain equipment and non-nuclear materials especially designed for use in nuclear activities, a momentum has been established which will enable the Secretariat to continue to study these proposals and to initiate additional studies on other possible safeguards measures which will contribute to the desired strengthening of IAEA safeguards.

The Secretariat will certainly continue to improve IAEA safeguards effectiveness and efficiency by improving its internal procedures and criteria and by developing new ideas and concepts. We are confident that the ongoing streamlining of IAEA safeguards and its increased role in the non-proliferation regime will provide additional assurances that there are no undeclared nuclear activities that might be used for a nuclear-weapon development programme.

Recent events have confirmed the effectiveness of the present safeguards system for declared materials and activities. It is worth mentioning that, even in the case of Iraq, the system was effective enough to block the easiest route to weaponization, which would have been to divert the highly enriched uranium that was under safeguards at Tuwaitha.

However, these recent events also have confirmed that this effectiveness of the safeguards system must be extended to all nuclear materials and activities in order to detect, in a timely manner, the development of clandestine programmes. This is the aim of the proposals for special inspections, provision of design information, procurement reports, and other procedures which presently are being considered. Ideally, this should proceed from a new spirit of openness and transparency in the exchanges of information between the IAEA and its Member States.

Safeguards are merely the institutionalized and regulated form of transparency. This institution and its associated regulations must be maintained, developed, and continuously rendered more effective and efficient. As a result of more openness and transparency, and additional information and access rights, IAEA safeguards will increase its contribution to world peace and stability and will permit more confidence in the peaceful character of all safeguarded nuclear activities.