

DRAWING SAFEGUARDS CONCLUSIONS FOR A STATE AS A WHOLE

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ABSTRACT

Over the past several years, the Agency has been strengthening its safeguards system in response to weaknesses identified in the early to mid-1990s. One of the most profound changes is the way in which evaluation of a wide range of information is used to determine the seriousness of indications of nuclear material diversion or undeclared nuclear material and activities, and to draw safeguards conclusions. Although nuclear material accountancy and verification of declared material and facilities remain fundamental aspects of the Agency's safeguards system, for States with comprehensive safeguards agreements there has been a shift in focus to consideration of the State as a whole.

All relevant information, including declarations by the State, the results of the Agency's verification activities, and from open and other sources, is evaluated to determine whether there is an overall consistency of information with regard to the State's past, present and planned nuclear programme. The evaluation considers a wider range of factors, including information on specific facilities and material under safeguards as well as information relevant to the State as a whole. The evaluation also seeks to determine whether the information is sufficient and complete and, if not, what further information and analysis is needed to draw meaningful conclusions. The results of the on-going evaluations for each State determine the State-level safeguards approach, i.e., the level and focus of safeguards activities for that State.

This paper outlines the process for drawing safeguards conclusions for the State as a whole, the formulation of State-level safeguards approaches, and the recent changes that have been made to support the implementation of the process within the Department of Safeguards.

INTRODUCTION

Each year, the Agency draws safeguards conclusions regarding each State's adherence to its safeguards commitments. For all States with comprehensive safeguards agreements,¹ this conclusion is based on the Agency having found no indication of the diversion of nuclear material placed under safeguards and no indication of undeclared nuclear material or activities for the State as a whole. The nature of the safeguards conclusion that the Agency can draw for a State depends on the nature of the State's safeguards undertakings. Therefore, for States with a comprehensive safeguards agreement but without an additional protocol² in force, the Agency's ability to detect indications of undeclared nuclear activities at undeclared locations is constrained. Only for a State with a comprehensive safeguards agreement **and** an additional protocol in force does the Agency have sufficient information and access to draw the broad safeguards conclusion that **all nuclear material** within the territories of the State, under its jurisdiction or under its control anywhere **had been placed under safeguards** and remained in peaceful nuclear activities or was otherwise adequately accounted for.

THE ROLE OF STATE EVALUATION IN DRAWING SAFEGUARDS CONCLUSIONS

Safeguards conclusions are based on the results of the evaluation of a State as a whole. State evaluation is a continuous process through which all relevant information available to the Agency is analysed. For States with comprehensive safeguards agreements, the evaluation process seeks to answer several questions:

- Is all relevant information on the State's nuclear programme consistent?
- Is the "picture" of the State's past, present and planned nuclear programme complete?
- Is there sufficient information available on which to draw a conclusion?

In addition, the evaluation results form the basis upon which the Agency develops and refines a State-level safeguards approach and plans the verification activities that need to be undertaken in the future.

Initial Safeguards Strengthening Measures

The information considered in the State evaluation includes State-supplied information, the results of verification activities and information from open or other sources. Under a comprehensive safeguards agreement alone (without an additional protocol in force with the Agency), the State-supplied information has traditionally focussed on facility and nuclear material related information, including nuclear material accountancy information and facility design information; and verification activities focussed on the verification of declared nuclear material at facilities.

With the introduction of strengthened safeguards since the mid-1990s, the focus of safeguards implementation shifted from declared facilities placed under safeguards to evaluation of information for a State as a whole. In addition to verification of the non-diversion of nuclear material, the Agency strengthened its capability to ensure that all material had been placed under safeguards and to detect indications of undeclared nuclear material and activities. The Agency requested States to provide more information in that regard, including: information on closed-down and decommissioned facilities, responses to State System of Accountancy and Control (SSAC) questionnaires, periodic reporting on exports and imports of sensitive equipment and non-nuclear material, holdings and exports of separated americium and neptunium, information on past activities, and responses to State-specific requests for further information. The Agency also established, and continues to develop, its capability to collect and analyse open source and other information including scientific and technical literature, media reports and satellite imagery.

In addition, in-field verification activities at facilities were further strengthened by, for example, the introduction of new methods of detecting undeclared nuclear activities, such as environmental sampling and satellite imagery analysis; and there was a reinforcement of States' obligations to provide facility design information at an early stage of construction planning and the Agency's right to conduct design information verification throughout the lifecycle of a facility. Nonetheless, for States with a comprehensive safeguards agreement but without an additional protocol in force, the Agency's ability to detect indications of undeclared nuclear activities at undeclared locations is constrained.

The Additional Protocol

States with an additional protocol in force are required to declare to the Agency a much wider range of information concerning their current nuclear fuel cycle related activities and future plans. The declarations include further information regarding nuclear material, including source material, locations and uses of exempted material and waste; and nuclear-related infrastructure, including co-located nuclear infrastructure, other locations where nuclear material is located, nuclear related research and development, manufacture and export of sensitive equipment and non-nuclear material, and future plans for developing the State's nuclear programme. The additional protocol also contains provisions whereby the Agency can request from a State amplification or clarification of declared information, information to facilitate the resolution of questions and inconsistencies, and information on operational activities of safeguards relevance. Importantly, the additional protocol also gives the Agency the authority to conduct in-field activities at a wider range of nuclear related locations.

State Evaluation

From all of the information available, the Agency seeks to form a comprehensive "picture" of a State's nuclear programme and nuclear ambitions and identify any potential indications of diversion of nuclear material or of undeclared nuclear material or activities. In the process, the State evaluation seeks to answer the following questions:

- Was adequate information available for consideration (from the State, as a result of verification, and from open or other sources)?
- Was an appropriate level of verification activities conducted upon which to base a sound safeguards conclusion (both in-field activities and the analysis of information)?
- Were verification activities implemented effectively and according to plan -- and, if not, why not?
- Are there any potential questions, inconsistencies or other issues/indications for which further follow-up activities are required?

Periodically, State evaluation reports documenting the results the evaluation of each State are prepared and submitted to a senior level committee for review. Each report includes background information on the State's nuclear programme, a consistency analysis of the elements of the programme and conclusions and recommendations. When reviewing a State evaluation report, the committee considers the significance of each finding and the extent to which it may weaken the basis upon which the safeguards conclusions are drawn; and makes recommendations for future follow-up actions accordingly. Ultimately, in light of this assessment, the Agency draws safeguards conclusions for the State as a whole.

STATE-LEVEL SAFEGUARDS APPROACH

Formulating the State-level Approach

For States with a comprehensive safeguards agreement and an additional protocol in force for which the Agency has drawn a broader safeguards conclusion, the level of safeguards activities applied under those agreements can be optimised in light of the added safeguards assurances. This optimisation is referred to as “integrated safeguards”. Initially, the notion of a State-level safeguards approach was developed as the means by which to indicate the safeguards measures to be applied to States under integrated safeguards. However, with the shift in focus to evaluation of a State as a whole, the State-level safeguards approach has taken on a greater role and significance in safeguards implementation for **all** States with comprehensive safeguards agreements.

The State-level safeguards approach is based on the State-specific set of objectives that need to be addressed in order to determine the relative level and focus of safeguards activities needed for the Agency to draw soundly-based safeguards conclusions. It is formulated in light of the State’s nuclear capabilities and the factors identified in the State evaluation. The overarching objectives include 1) verifying that no nuclear material placed under safeguards has been diverted and 2) seeking indications of undeclared nuclear material and activities. In addition, the State-level approach calls for pursuing the resolution of questions or inconsistencies that may arise in the course of safeguards implementation.

For the first objective, the State-level safeguards approach specifies the activities considered to be sufficient to detect with a reasonable probability the diversion of nuclear material placed under safeguards. For States for which the Agency has not yet drawn the broader safeguards conclusion, the inspection activities have traditionally been prescribed by the Agency’s safeguards criteria. In addition, facility-specific plans for design information verification prescribe the activities that should be conducted during the life cycle of the facility to assure that the facility-level safeguards approaches remain valid and that facilities are being operated as declared.

The second objective, seeking indications of undeclared nuclear material and activities (at either declared or undeclared locations), is often made up of several sub-objectives relating to particular components of a nuclear fuel cycle, for example associated with reprocessing or enrichment. The State-level approach indicates the relative level and focus of activities, for example environmental sampling, complementary access, unannounced inspections, or analysis of satellite imagery or other information, that should be conducted to meet those sub-objectives. Safeguards measures to meet this second objective are specified in the State evaluation reports and reviewed during that process.

In 2001, the Agency developed internal guidelines for the development of State-level safeguards approaches as part of the conceptual framework for the implementation of integrated safeguards³. State-level safeguards approaches lend flexibility to safeguards implementation. For States under integrated safeguards, there is even greater room for flexibility because of the Agency’s additional rights to information and access provided under an additional protocol and due to the added assurances regarding the absence of undeclared nuclear material and activities. Therefore, to ensure comparability between State-level approaches each new State-level integrated safeguards approach is reviewed by a technical review committee to assess its consistency with the conceptual framework for integrated safeguards.

As part of the State evaluation process, each State-level safeguards approach is to be reviewed periodically by the senior management of the Department of Safeguards to assure that it remains appropriate in light of the State's nuclear programme, the evaluation of the consistency of information regarding the State's nuclear activities and the results of previous verification activities.

Planning Safeguards Activities

To implement a State-level safeguards approach, the Agency plans and conducts activities to meet each of the objectives on an annual basis. In addition, the Agency follows up on issues and findings resulting from the State evaluation, particularly those assessed to have potentially weakened the basis upon which the safeguards conclusions for the State were drawn. These factors could include, for example, causes of failures to attain criteria-driven inspection goals, material balance and other nuclear material accounting shortcomings, problems in effective or efficient implementation of safeguards, and the extent to which a SSAC meets its obligations under its safeguards agreements; and the assistance that the Agency could provide to help it to improve, when needed.

Safeguards Implementation Effectiveness Evaluation

Some of the verification activities that are conducted to implement a State-level approach are not based on the safeguards inspection criteria, and therefore cannot be evaluated to have either "passed" or "failed" according to that standard. Instead, evaluation of the effectiveness of safeguards implementation considers whether the activities conducted have adequately addressed all aspects of the State-level approach, and whether they could be conducted effectively. If the activities planned and conducted had deviated from the State-level approach or could not be conducted effectively (e.g., due to delayed access, incomplete or inaccurate information, or other implementation difficulties) the evaluation identifies those cases. In the State evaluation process, when drawing safeguards conclusions, senior management reviews the reasons and conditions for any deviations from the safeguards approach and/or planned activities and their impact on the Agency's ability to draw safeguards conclusions. This includes a review of the progress made in resolving questions, inconsistencies and addressing previously identified safeguards implementation issues.

RECENT DEVELOPMENTS AND FUTURE DIRECTION

The State evaluation process has continued to evolve. In 2003 a comprehensively revised template and guidance for drafting State evaluation reports was issued and now forms the basis for current State evaluation reports. One of the major changes from the previous template is the elaboration of a variety of factors relating to the State as a whole, for example overall consistency of nuclear-related research and development activities with the State's planned nuclear programme, analysis of nuclear material flows and inventories for the State as a whole, the State's fulfilment of its obligations under its safeguards agreement, nuclear related industrial capabilities, and scientific and technological cooperation in nuclear-related fields.

The Safeguards Implementation Report (SIR) is the IAEA Secretariat's annual report to the Board of Governors on the Safeguards Department's work, including its safeguards conclusions, safeguards implementation and evaluation results, improvements in efficiency and effectiveness, challenges, and utilization of resources. Although the SIR has evolved over

the years, the most recent SIR for 2003⁴ contained significant modifications aimed at more clearly reflecting the nature of safeguards conclusions depending upon a State's safeguards undertakings, and the shift in safeguards focus from strictly inspection goal attainment at facilities to the evaluation of information for each State as a whole. This change was strongly commended by the IAEA Board of Governors and the Director General's Standing Advisory Group on Safeguards Implementation (SAGSI).

The State-level safeguards approach has been an important element of the conceptual framework for implementing integrated safeguards in States with a comprehensive safeguards agreement and an additional protocol in force for which the Secretariat has been able to draw the broad conclusion on the non-diversion of nuclear material and absence of undeclared nuclear material and activities. In the context of its recent review of the Agency's safeguards criteria, in its final report of May 2004 SAGSI underlined the importance of implementing safeguards on the basis of a State-level approach for **all** States with comprehensive safeguards agreements.

To ensure the overall quality of the processes by which safeguards conclusions are drawn, the Safeguards Department is in the early stages of implementing a quality management system. The system will apply the principle of continual improvement to the processes associated with the planning, implementation and evaluation of safeguards activities to ensure the accuracy of information and consistency of analyses that form the basis for deriving safeguards conclusions and, where possible, to improve the efficiency of those processes.

CONCLUSION

There has been a considerable evolution in the Agency's safeguards system over the past several years in order to strengthen safeguards effectiveness, in particular the ability to detect indications of undeclared nuclear material and activities. For States with comprehensive safeguards agreements in force, the focus of the safeguards system has shifted from the facility level to the evaluation of a wider range of information related to the nuclear related programme of each State as a whole. The results of each State evaluation form the basis for developing a State-level safeguards approach, identifying the safeguards activities needed to implement the approach, evaluating the effectiveness of the safeguards activities, and assessing the impact of difficulties encountered in safeguards implementation. This process allows some flexibility to the Agency in implementing safeguards on a State-specific basis, but the flexibility of the system is limited for States that do not have an additional protocol in force. Although much work has been done to develop the Agency's infrastructure for implementing safeguards based on State-level approaches, more development and refinement of the component processes is still needed. The strengthening of the safeguards system will continue to be a work in progress. Recent experience has shown that the safeguards system needs to be adaptable to respond effectively, as needed, to emerging challenges and to become more efficient, wherever possible.

FOOTNOTES

¹ Based on *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 (Corrected), 1972

² *Model Protocol Additional to the Agreement(s) between the State(s) and the International Atomic Energy Agency for the Application of Safeguards*, INFCIRC/540 (Corrected), 1997

³ Jill N. Cooley, “*The Conceptual Framework for Integrated Safeguards.*” Proceedings of the 43rd Annual Meeting of the INMM.

⁴ <http://www.iaea.org/OurWork/SV/Safeguards/es2003.html>