

ALTERNATIVES FOR INCREASING THE COOPERATION WITH RSAC/SSAC

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ABSTRACT

The increased co-operation with Regional or State Safeguard's System (R/SACC) is a relevant tool for strengthen effectiveness and improving the efficiency of the international safeguard. The new safeguards system that emerges from the application of the Additional Protocol (INFCIRC/540) is a defy and an opportunity for effectively incorporate R/SACC into the international safeguards scheme. The challenge is to develop requirements and conditions that have to be fulfilled by the Regional or State Systems in order to enable the IAEA to confirm on a continuous basis its reliability, technical capability and effectiveness. This paper presents some conditions and alternatives that can be explored for the practical incorporation of R/SACC into international safeguards considering different levels of co-operation with the IAEA.

INTRODUCTION

The implementation of the Additional Protocol to a INFCIRC/153 Safeguards Agreement shall allow the Agency to get credible assurance of the absence of undeclared nuclear materials, activities and facilities in a given country. Under this new scenario, the current IAEA safeguard system is being reformulated and an “Integrated Safeguards System” will be implemented. In this paper, Integrated Safeguards means the optimized combination of the new tools of the Additional Protocol and traditional safeguards activities. The new safeguards system should make the best use of the available resources to maximize the safeguards effectiveness and efficiency. However, detection of diversion of declared nuclear material continues to be a strong indicator of potential undeclared nuclear activities and, therefore, nuclear accountancy as well as other traditional safeguards activities remain as an essential element of the integrated safeguards system.

In a logic approach, the Agency's ability for reaching a conclusion on the absence of undeclared nuclear materials and activities in a State demands the redefinition of its present safeguards criteria. In their reformulation, it seems reasonably to expect a significant modification of the frequency and intensity of safeguards activities for declared materials and facilities. More than was foreseen in INFCIRC/153, IAEA safeguards on declared facilities should focus on sensitive stages of the nuclear fuel cycle (enrichment, reprocessing, MOX fabrication and HEU and Pu storage). By the contrary, verification procedures on other stages may be minimized (conversion and fabrication, reactors, LOFs).

The combination of safeguards measures may consider an additional element for increasing the effectiveness and efficiency of the international safeguards system: the appropriate incorporation in the international scheme of Regional and State Systems for Accounting and Control (R/SSAC). Such incorporation should be established by conditions and requirements

that a given R/SSAC has to fulfill to be taken into account by the Agency's safeguards. This subject was addressed in previous papers /1,2,3,4/. Technical capabilities and effectiveness are to be defined and evaluated to determine the quality of the findings of a R/SSAC. In addition, a procedure should be established for allowing the Agency to confirm the uninterrupted quality and reliability of the R/SSAC that would consider, inter alia, the random independent verification of its findings.

The co-operation with R/SSAC, though foreseen in INFCIRC/153, for historical and political reasons was never practically implemented. The technical and political situations that come from the Additional Protocol are completely new and it seems that now is the time to effectively incorporate into the international safeguards scheme the R/SSACs. It seems rational to use to the extent possible the genuine effort made by some countries and regions to increase the effectiveness and efficiency of international safeguards.

THE ROL OF R/SACC AS DEFINED BY INCIRC/153

The consideration of R/SSAC for international safeguards is not new. INFCIRC/153 states (Art. 7) that the State shall establish and maintain a system of accounting and control of all nuclear materials, and its safeguards shall allow the IAEA to verify the findings of the R/SSAC. For this purpose, the IAEA may perform independent measurements, and its verification shall take due account of the technical effectiveness of the State's system. Furthermore, the document foresees (Art. 31) that the IAEA, in its verification activities, shall make full use of the R/SSAC and shall avoid the unnecessary duplication of the R/SSAC activities. INFCIRC/153 also stated that the criteria to determine the actual number, intensity, duration, timing and mode of routine inspections of any facility shall include the effectiveness of the R/SSAC. In simple terms, it seems that the purpose of all these provisions was to commission to the R/SSAC the direct control of the nuclear materials and facilities entrusting the IAEA the control of the R/SSAC. This does not mean that the IAEA can not draw independent conclusions, but that IAEA does not need to repeat all the activities of the States or Regional System for reaching an independent conclusion.

Observing the development of the international safeguards activities that lead to the establishment of the IAEA Safeguards Criteria, one finds out that the provisions of INFCIRC/153 regarding the use of the R/SSAC were never truly implemented. The main reason for this situation seems to be that the current IAEA Safeguards Criteria were developed and intended for a uniform application at facility level worldwide while some differentiation should appear among similar facilities in different States as results of distinct quality and credibility of the R/SSAC). At any rate, procedures for the evaluation of R/SSAC technical effectiveness were never developed and, consequently, the Agency was unable to verify the quality of the findings of the R/SSAC. In the current Safeguards Criteria the Agency does not consider the existence of R/SSACs to define the normal frequency and intensity of inspections. In 1999 the Agency introduced for the first time alternative inspection procedures for LWR without MOX and DNLEU Conversion and Fuel Fabrication Plants under co-operation arrangements between the Agency and an SSAC. These procedures that shall be agreed on a case by case basis define some specific measurements that may be performed by the SSAC. However, for Agency verification purposes, measurements may be carried out by the SSAC in the presence of an Agency inspector.

Probably there were other reasons for not considering existing effective R/SSAC, for

instance, the fact that INFCIRC/153 seems conceived more for controlling operators than a State and in this context the IAEA role was somewhat unclear. At any rate, the lack of requirements that a R/SSAC has to accomplish in order to be considered effective has had a twofold adverse effect:

- a) The Agency has not experience on procedures for confirming the effectiveness of R/SSAC systems, and
- b) The State or Regional systems have not a clear reference of what would be the conditions for being considered as safeguard effective from an international point of view.

CO-OPERATION WITH REGIONAL AND STATE SAFEGUARDS SYSTEMS

As indicated above, the Additional Protocol means a new scenario and under this context it seems prudent and logic to look for an active participation of R/SSAC in the new international safeguards regime. Properly implemented, this participation will use present resources of states or regions to increase the effectiveness and efficiency of international safeguards. In fact, the increased co-operation with R/SSAC was considered an important component for the Strengthened Safeguards System in the framework of the Program 93+2.

SAGSI expressed that the Agency could use the results of some activities performed by the R/SSAC (without delegating its responsibilities). The basic condition for a greater reliance on the R/SSAC would be the transparency of the State's nuclear activities. Three different levels were distinguished which would increase cost effectiveness of Agency safeguards through increased co-operation with R/SSAC /5/.

In the first level, the roll of the R/SSAC is to facilitate the Agency's inspection activities and help the Agency to achieve its goals with minimum difficulty and maximum efficiency. In this level the R/SSAC would only have an enabling role.

In the second level, the R/SSAC gives additional help working along side the Agency inspectors to conduct on their behalf and under their control, tasks that the Agency inspectors would otherwise have undertaken. Sharing instruments and analytical capabilities could also be included in this level. The essential requirement is that the activities carried out by the R/SSAC inspectors are done under conditions such that the Agency can have confidence that the R/SSAC results have not been falsified.

In the third level of co-operation, the Agency would use the results of the R/SSAC inspection activities in place of some Agency inspection activities being the Agency able to reach its own independent conclusions. This would reduce the extent of Agency inspections while maintaining effectiveness. The proper implementation of the Additional Protocol with the consequent conclusion of the absence of undeclared nuclear materials, activities and facilities should facilitate the implementation of the third level due to the gain of transparency of the State activities.

For each level, it would be necessary to establish requirements for the R/SSAC technical capabilities and effectiveness, and to develop guidelines for their evaluation. Appropriate procedures for the Agency making full use of R/SSACs should be put in place to optimize the resources invested in traditional nuclear safeguards. The minimum requirements and conditions that enable the Agency to draw independent conclusion should be developed.

Although the wide discussion on an active role of R/SACC in international safeguards appears to be relatively new, it is stressed that it is a normal practice for an organization to delegate the execution of some tasks to another organization. Examples of the nuclear area are:

- a) services, studies or evaluations carried out by private companies or universities for a nuclear regulatory body;
- b) verification of critical components of a nuclear facility carried out by private or state organizations for the operating organization, and
- c) maintenance of critical equipment of a nuclear facility done by third parties on behalf of the operating organization.

In all cases, the primary responsibility can not be delegated, and the responsibly organization shall to establish procedures, conditions and requirements that allow it to have a sound and independent conclusion regarding the performance of the whole system in spite of the fact that the execution of several tasks has been delegated. Auditing activities, including random independent verification, are a normal practice in all these cases.

REQUIREMENTS FOR THE R/SSAC TECHNICAL CAPABILITY

A basic assumption that is made in this paper is that after the implementation of the Additional Protocol, Regional and State systems will continue to effectively control declared nuclear materials and facilities. In other words, the entry into force of the Additional Protocol will not adversely affect the current regional/state safeguards activities neither will significantly modify the usual control practice.

Another assumption that is made arise from the fact that integrated safeguards will focus on a State as a whole rather than look to particular facilities. In consequence, a uniform worldwide application implies that the same rules will apply to all States but not to all facilities of a given type disregarding its country's location. This switching in focus is inherent to the Additional Protocol and provides room for a proper incorporation of R/SACC safeguards activities in those cases where the protocol is successfully implemented.

In this context, the integration of a R/SACC into the new international safeguards scheme will be basically limited to the verification of declared nuclear materials, activities and facilities (e. g. the so called 'traditional safeguards'). It is noted that the legal bases as well as the primary provisions for the incorporation of the R/SACC are those already included into INFCIRC/153 safeguards agreements. Accordingly, the R/SSAC shall establish and maintain a system of accounting for and control of all nuclear material subject to safeguards. INFCIRC/153 also lists the measures necessary to be applied by the R/SSAC. By definition, this constitutes the minimum requirements for a R/SSAC.

However, regarding technical capabilities, requirements for the first level of co-operation should be developed addressing quality of accounting and operational data at facility level as well as quality of accountancy reports provided to the Agency. Another element of consideration is the quality of information on facility design and operation provided to the Agency and the continuous verification that the facilities operate as declared.

For the second and third level, requirements for the R/SSAC technical capabilities should further include: the existence of sound safeguards approaches that meet at least the Agency's safeguards criteria reflected in inspection procedures with clear objectives. These requirements should also consider the quality of the verification activities, including design verification. Finally, the system of inspections for verification of nuclear material inventories and inventory changes, C/S measures; quality and timing of R/SSAC inspections and results; and number and quality of the personnel involved, in particular inspectors.

EVALUATING THE TECHNICAL EFFECTIVENESS OF R/SSACs

To make full use of a R/SSAC the Agency has to verify the quality of the findings of the R/SSAC and to draw independent conclusion. This requires the specification of elements to assure the quality of the R/SSAC results and the definition of the conditions for the independent conclusion. The process can be addressed in five stages:

The first one considers the legal basis of the R/SSAC including the characteristics of the R/SSAC fuel cycle, its structure and independence. Considerations on less objective elements such as those derived from the application of the Additional Protocol can be include in this stage.

The second stage is the evaluation of the R/SSAC technical capabilities. This stage should include auditing every aspect of the R/SACC as part of an appropriate quality assurance program.

The third stage should address the timing of the information provided by the R/SSAC to the Agency on nuclear material inventories and inventory changes, on operational program of nuclear facilities, on inspection schedule, and on inspection results, verifications and conclusions.

The fourth stage should include the inspection activities when both Agency and R/SSAC are present (e.g. distribution of tasks, use of common working papers, joint use of C/S and other equipment. A possible scheme may include two situations, in the first one Agency inspectors join in short notice an R/SSAC inspection, and in the second one the Agency's may trigger an unannounced inspection short after the R/SSAC inspection is concluded. The Agency would conduct only a percentage of the R/SSAC inspections, being the figures defined in a case by case basis.

The fifth stage considers an audit process of the whole safeguards system that includes collecting information, follow up of corrective actions and actions for fraud detection /6/.

CONCLUSION

The implementation of the Additional Protocol provides a unique opportunity for the effective incorporation of R/SACC into the international safeguards scheme allowing to increase the efficiency and efficacy of international safeguards by making proper use of genuine efforts carried out by regions or states. The legal basis already exists, the snitching in focus to whole sates allows its proper introduction without discrimination, and the experience from other areas can be used for defining proper conditions and requirements. This process

implies a significant change of the present relationship between the Agency and Regional/State Systems that should reflect the new technical and political situation.

The Agency should be able to draw independent conclusions while verifying the findings of the R/SSAC. For this purpose, the challenge is to establish sound conditions and requirements that a R/SSAC should fulfill. Besides the consideration on the R/SSAC technical capability, the focus of the discussion should be the evaluation of the R/SSAC technical effectiveness.

The requirements, criteria and procedures to be used for evaluating an R/SSAC will allow both the IAEA to consider R/SSAC verification activities and the R/SSAC to consider improvements of its system for a better inclusion into the integrated scheme. An auditing process should be used by the IAEA to confirm, on a continuous basis, that the R/SSAC maintains its technical effectiveness, reliability and capability. A detailed explanation of the safeguards' objectives that are intended to be covered by the Integrated Safeguards Criteria would allow considering alternative safeguards activities for covering these objectives because use is made of R/SSAC resources.

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