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## **THE SSAC OF ARGENTINA - POSSIBLE AREAS TO INCREASE CO-OPERATION WITH ABACC AND IAEA**

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### **ABSTRACT**

This paper deals with one of the measures identified in the Program 93+2 to enhance international safeguards effectiveness and efficiency. This measure is related to increase co-operation between the IAEA and the SSAC in the implementation of safeguards. It is recognized that an effective SSAC could contribute to better safeguards.

During the discussion to strengthen the safeguards system different levels of co-operation between the IAEA and the SSAC were identified, depending on their features and capabilities. To start assessing the possibility of increasing this co-operation, a "SSAC Questionnaire" was submitted by the IAEA to Member States, EURATOM and ABACC. At present, those questionnaires are being assessed by the IAEA in order to identify areas for further co-operation. One important aspect is the increased co-operation level that might be achieved when the Additional Protocol becomes an integral part of the safeguard agreements. Another one refers to the methodology that IAEA might employ to audit the quality and performance of the SSAC regarding the different levels of such co-operation.

This paper will also describe the features of the SSAC of Argentina emphasizing its capabilities and the various areas that might be considered to increase further co-operation with ABACC and the IAEA.

### **NUCLEAR REGULATORY AUTHORITY (ARN) OF ARGENTINA – LEGAL FRAMEWORK**

The ARN was created as an autonomous organization under a Federal Nuclear Activity Act that came into force on April 25, 1997 to succeed the National Regulatory Board. The ARN reports directly to the Argentine Presidency and has been empowered to regulate and control all nuclear activities carry out in the Country concerning radiological and nuclear safety, physical protection, and nuclear non-proliferation aspects.

It has full capacity for action in both Public and Private Law. The ARN also has the attributions and obligations, among others, of issuing regulatory standards related to radiological and nuclear safety, physical protection and non-proliferation, licensing and radiological control of nuclear installations.

In the field of the guarantees of non-proliferation, the ARN shall insure that nuclear materials and activities shall not be deviated to any unauthorized purpose and that they shall be performed in compliance with all international commitments assumed by Argentina. Among others, it is worth to mention here, the Bilateral and Quadripartite Agreements.

The "Agreement between the Argentine Republic and the Federative Republic of Brazil for the Exclusively Peaceful Use of Nuclear Energy" (Bilateral Agreement) is in force since December 1991. To verify the fulfillment of its basic undertaking, Argentina and Brazil commit themselves to submit the whole of their nuclear material to the Common System of Accounting and Control of Nuclear Material (SCCC). The Argentine-Brazilian Accounting and Control Agency (ABACC) is the bilateral agency for its application and administration.

After the bilateral agreement came into force, the “Agreement between the Argentine Republic and the Federative Republic of Brazil, ABACC and the IAEA” (Quadripartite Agreement, INFCIRC/435), was also signed in 1991 and entered into force on March 4, 1994.

For safeguard purposes, a State System of Accounting and Control (SSAC) was established since the beginning of the nuclear activities in the Country. This system is revised and updated from time to time taking into account new developments. The National Standard AR.10.14.1 outlines the general requirements of the SSAC to ensure the ARN objectives.

The SSAC contains also provisions to comply with bilateral safeguards requirements usually included in the “Nuclear Co-operation Agreements”. These requirements are applicable not only to nuclear material but also to material, equipment, and facilities.

## **STATE SYSTEM OF ACCOUNTING AND CONTROL OF NUCLEAR MATERIALS (SSAC)**

The SSAC is applied to all nuclear materials in all nuclear activities carried out in Argentina. The SSAC establishes as a requirement at the operators' level of any relevant installation, the implementation of an accounting and control system for safeguards purposes. This system has to include a measurement and analysis scheme that allows determining the inventory of nuclear material and its changes. This system has to include procedures for error calculation, accuracy, and uncertainty evaluation, as well as for quality assurance, in compliance with international standards.

Therefore the operator has to implement a coherent and consistent system of records and reports for each Material Balance Area, based on support, source and operative documentation that allows to be audited by the ARN or IAEA and ABACC.

As an independent verification system and in order to reach its goal and objectives, the SSAC at the State level has a program of routine and special inspections (e.g., physical or design verification inspections performed by its own staff of safeguards inspectors). The results and conclusions of the SSAC inspections are showed in an internal inspection report, which allows the following up of the situation in each facility.

Additionally, noting the importance of trained staff, the ARN has established a permanent training program that includes the participation of its personnel in regional and international courses.

Besides, the ARN has various laboratories of non-destructive and destructive analysis and one for the analysis of environmental samples. Some of them process samples obtained from the SSAC inspections and are regularly involved in international quality assessment programs aimed at keeping up the required operation standards. Within the quality assurance framework, the SSAC has implemented a program of inter-comparison of results between other national laboratories. At present, an Accelerator Mass Spectrometry laboratory is being installed, in order to perform in a near future particle analysis of environmental samples for safeguards purposes.

On the other hand, to manage the great deal of accounting and inspection data in an efficient way two databases were implemented by the ARN that interacts amongst them. This software was developed to optimize the programming of the inspections and their evaluation and to improve the issuing and submission of the accounting reports. The System of Control of Nuclear Material (SCMN) is aimed at centralize all safeguards accounting data of the whole facilities, and the System of Safeguards Inspections (SIS) aimed at processing all national inspection data. Regarding the SSAC, the software takes into account not only all the requirements arising from the safeguards agreements in force but also the national standards.

Concerning containment and surveillance measures, the SSAC also foresees its use (e.g. seals, digital cameras, radiation and movement sensors) as a complementary measure.

## **INTERNATIONAL SAFEGUARDS CO-OPERATION**

Besides the due co-operation foreseen in the safeguards agreements and, in our case, in the Bilateral Agreement, Argentina maintains a permanent co-operation on the development and tests of new techniques and safeguards methods both with IAEA and ABACC. This co-operation is made possible through the ARN and joint collaboration efforts made with others national institutions. In addition, the ARN work in the field of safeguards and non- proliferation jointly with other organization such as DOE, US National Laboratories, and AECB through co-operation agreements. We believe that such co-operation contributes not just to the effectiveness and efficiency of safeguards but also it is one of the means of scientific exchange and increases the trust on the technical competence and the credibility on the nuclear global regime of non-proliferation.

More recently, within the framework of the strengthening of international safeguards, an active participation was kept on the testing of measures already identified on Program 93+2. Among them, in 1992 Argentina through ARN participated in: the Agency field trial on environmental samples from uranium enrichment facilities, with a very positive outcome. Besides, since 1994, the ARN participated in the "International Remote Monitoring Project" (IRMP) coordinated by DOE to demonstrate the feasibility of the use of the Remote Monitoring System (RMS) for safeguards purposes. Later on, in co-operation with DOE and US National Laboratories, it starts the design and development of different applications of this system to Argentine facilities. As a result, new jointly tasks were carried out between Argentina, USA, the IAEA and ABACC for the implementation of a RMS at Embalse NPP.

Also, on a first stage, ARN efforts took into account the priority assigned to the application of safeguards to the uranium enrichment plant. Emphasis was put on developing a method for the inventory verification of nuclear material (i.e. hold up) from the gaseous diffusion uranium enrichment plants and also contributed to the development of a safeguards approach. Also, priority was assigned to improve safeguards effectiveness and efficiency at Embalse reactor (Candu 600), whose inspection effort used to be enormous.

Within the framework of the Argentine Safeguards Support Program (ARGSP), the ARN have participated initially on tasks and actions towards technical solutions to specific problems or needs on the application of safeguards to Argentine facilities. During the last few years, a favorable turn occurs on the co-operation on tasks related with the strengthening of safeguards and the design of an integrated safeguard system. The ARN kept an active participation on those areas related with the integration of traditional safeguards and the new strengthening measures, orienting his collaboration towards studies and needs on a more conceptual and qualitative basis.

Among these tasks, the most relevant is the one related with the application of the State-level integration on fuel cycle under safeguards.

On the other hand, and taking into account the co-operation protocol between ABACC and ARN, both Organizations have jointly worked through specific agreements in order to further improve the application of the SCCC at Brazilian and Argentine facilities. The main areas of co-operation are related with containment and surveillance, remote monitoring, Non Destructive Assays (NDA) and Destructive Assays (DA). The ARN contributes to ABACC not only his professional inspectors staff members, but also his scientific-technical support through advisory expert groups and others technical capabilities.

At present, the ARN has set some priorities based on the importance of some new strengthening measures.

## **INCREASED CO-OPERATION BETWEEN SSACs AND REGIONAL SYSTEMS OF ACCOUNTING AND CONTROL (RSACs)**

Co-operation between a SSAC, RSACs and the Agency is a necessary condition for a successful implementation of safeguards. At present, within the framework of the Quadripartite Safeguards Agreement, all parties cooperate in facilitating the application of safeguards. In

addition, ABACC and the Agency already co-ordinate their activities as foreseen in the Protocol to the agreement. In this regard, it is important to highlight the enormous progress made by them in agreeing procedures for a better co-ordination of their inspection activities and the common use of certain equipment.

On the other hand, in the context of the strengthening of safeguards, a greater co-operation with the SSACs and/or RSACs was considered as one of the measures to increase its effectiveness and/or efficiency. Some levels of co-operation were identified such as the sharing of equipment and the installation costs and sharing chemical analytical facilities with the SSAC/Operator as potential cost saving measures.

In addition to the above mentioned areas, the evaluation of a higher level of such co-operation that would allow to increase effectiveness and reduce the Agency's resources and costs for safeguarding of declared nuclear material, was also considered.

The levels of co-operation identified were:

- enabling activities (such as greater involvement of the SSAC in the activities already foreseen in the existing safeguards agreements in order to increase the efficiency of Agency inspections);
- joint or shared inspection activities (e.g. to share some equipment and laboratories);
- SSAC / RSAC inspection activities (e.g. to take into account, under certain conditions to be established, the results of a RSAC inspection activities)

It is clear that increased co-operation with SSAC and/or RSAC will depend on their capabilities and resources. Besides, the need of the parties concerned to maintain their own independent conclusions should be also taken into account. In this regard, the Agency based on the questionnaires submitted by Member States and RSACs is evaluating their capabilities and structures to identify areas for increasing the current level of co-operation.

Regarding the Quadripartite Safeguards Agreement, the IAEA, ABACC and the SSACs should work together to identify further areas to increase their co-operation.

## **CONCLUSIONS**

- In order to improve effectiveness and efficiency of national and international current safeguards, the ARN co-operates with IAEA and ABACC in: doing tasks to let the IAEA and ABACC inspect with less effort and cost and, in carrying out the selected safeguards support activities, such as inspectors training, development of safeguards equipment and procedures and approaches.
- Argentina has responded the SSAC questionnaire sent by the Agency. Preliminary areas of increased co-operation with the Agency and ABACC are related for example to some activities in the field, the use of analytical laboratories (specially regarding the analysis of swipe samples and environmental sampling) and in the development of new safeguards methods and techniques.
- We are convinced that a greater co-operation with both the SSAC and RSACs is one of the promising measures to improve safeguards effectiveness and efficiency. This is of particular relevance in the context of strengthened safeguards and, in the short run, in the integration of safeguards. Regarding the above, once the Additional Protocol were implemented, it would be expected additional possibilities of co-operation with the Agency. The paramount of the increasing of co-operation is the possibility for the SSACs and/or the RSACs to carry out selected inspection activities.

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