



ABACC: A REGIONAL SAFEGUARDS AGENCY

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INTRODUCTION

Since 1985 Argentina and Brazil have assumed various commitments on the exclusively peaceful use of nuclear energy and of their nuclear programs.

This process culminated in the Foz de Iguazú Declaration, signed in November 1990, by means of which both Governments decided to establish a Common System of Accounting and Control of Nuclear Materials – SCCC – to be applied to all nuclear activities of Argentina and Brazil, and to begin negotiations with the International Atomic Energy Agency – IAEA – aimed at reaching an agreement on joint safeguards based on the SCCC.

On the 18th July 1991, the Bilateral Agreement on the Exclusively Peaceful Use of Nuclear Energy was signed ^[1]. This agreement formally establishes the SCCC and creates the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials – ABACC – to implement the Agreement. This document entered into force on the 12th December 1991, after ratification by the Congresses of Brazil and Argentina.

The agreement with the IAEA announced in the Foz de Iguazú Declaration and based on the SCCC, was signed by both Governments, the ABACC and the IAEA on the 13th December 1991, and is known as the Quadripartite Agreement ^[2]. It only entered into force on the 4th of March 1994, after being ratified by the Congresses of both countries.

Today, ABACC relies on a six year experience applying safeguards based on the Bilateral Agreement and a four year experience applying the Quadripartite Agreement to point out some advantages of a regional system as a means to strengthen safeguards.

THE COMMON SYSTEM OF ACCOUNTING AND CONTROL – SCCC

The basic undertakings of the Bilateral Agreement between Argentina and Brazil are:

- a) To use nuclear materials and facilities under the signatories' jurisdiction or control exclusively for peaceful purposes.
- b) To prohibit and to prevent in the signatories' respective territories, and to abstain from carrying out, promoting or authorizing directly or indirectly, or from participating in any way in:
 - the testing, use, manufacture, production or acquisition by any means of any nuclear weapon; and
 - the receipt, storage, installation, deployment or any other form of possession of any nuclear weapon.

The Agreement also establishes that any serious non-compliance by either of the Parties enables the other party to abrogate the agreement, with the obligation to notify the Secretary General of the United Nations and the Secretary General of the Organization of American States of this fact.

ABACC was created to verify the control commitment of the Bilateral Agreement. Its objective is to administer and apply the SCCC, also established by this Agreement.

The SCCC is a set of procedures to detect, with a reasonable degree of certainty, if the nuclear materials in all of the two countries' nuclear activities have been diverted to uses not authorized under the terms of the Bilateral Agreement. It was conceived as a full scope safeguards system to be implemented by a central executive body – ABACC –, which is technically and financially supported by the Parties (Argentina and Brazil) to carry out its duties.

This system requires the concurrence of efforts of Operators, National Authorities and of ABACC itself. The National Authorities play a significant and special role in the implementation of the SCCC: besides the usual activities at the state level, each of the National Authorities is the natural channel through which ABACC requires the services needed to perform control activities in the other country. With this conception, the SCCC requires very well established National Authorities, not only able to fulfill its responsibilities at a national level but also to support ABACC's activities. This double role of the National Authorities is new in the safeguards field. The technical support made available by Brazil and Argentina embraces inspectors, consultants, equipment maintenance and calibration, preparation of standards, laboratory services and any other safeguards related study or service.

The SCCC consists of the General Procedures and the Application Manuals for each installation. The Application Manuals should be negotiated between ABACC and the respective country for each facility. The General Procedures contains the directives of the SCCC. The adequate level of accounting and control of nuclear material in each facility and other locations shall be specified in the corresponding Application Manual, taking into account the following parameters:

- the nuclear material category, considering its relevant isotopic composition;
- the conversion time;
- the inventory or annual throughput of nuclear material production.

The nuclear material accountancy is based on measurement systems compatible with the latest international standards and conforming to the SCCC objective.

The safeguards basic criteria and procedures adopted by ABACC do not constitute a rigid set of rules. Each specific case is studied and control measures are established taking into account the facility and the characteristics of the nuclear installations in each country. This approach is possible because of the small number of facilities to be safeguarded in Brazil and Argentina. It allows ABACC to easily introduce modifications whenever necessary and to incorporate new safeguard's technologies under development, which could produce a considerable impact by increasing the effectiveness of safeguards.

Table I: Facilities and LOFs in Argentina and Brazil

Type	Argentina	Brazil	Total
Conversion facilities	5	1	6
Enrichment facilities	1	2	3
Fuel fabrication facilities	4	1	5
Power reactors	2	1	3
Research reactors	6	3	9
R&D facilities	3	3	6
Critical/sub critical units	-	3	3
Storage facilities	3	2	5
LOFs on fuel research	4	5	9
LOFs on reprocessing research	-	1	1
LOFs analytical lab.	4	2	6
Other LOFs	6	6	12
Total	38	30	68

THE ABACC INSPECTORATE

The organizational structure of ABACC consists of a board, named the Commission, integrated by four members appointed by the Governments of Brazil and Argentina, and an executive body, named the Secretariat. The Secretariat consists of a Secretary and a Deputy Secretary (who take in turns each year to act as Secretary of the ABACC), a staff of ten professional officers, five office clerks and part-time inspectors provided by the two countries.

The inspections are performed in a cross national basis: Argentine inspectors carry out inspections in Brazil and vice-versa. The names of the experts that will be added to the list of ABACC inspectors are suggested by the Governments of Argentina and Brazil and must be approved by the Commission. These inspectors do not work permanently for ABACC; they are convoked by the Secretariat whenever necessary. The team of inspectors consists of about 76 persons, divided by half between Argentineans and Brazilians. Some inspectors work for the State Safeguards System and others are experts from the nuclear field. This fact allows the Secretariat of ABACC to integrate its team of inspectors with safeguards specialists as well as with operators of a particular type of facility. Indeed, this is one of the main advantages of this system, since the inspectors are experts in the process used in the installation to be inspected.

A permanent training program for different groups of inspectors, with different needs, is implemented every year. Training courses organized and carried out by ABACC focus in measurement techniques and equipment operation, accountability activities, preparation of inspection reports, data bank uses. ABACC also fosters workshops involving physical inventory verifications (PIV) for a particular type of facility.

ABACC-IAEA: APPLYING SAFEGUARDS

The Agreement between Argentina, Brazil, ABACC and the IAEA for the application of safeguards, called the Quadripartite Agreement, was signed in December 1991. This is a full scope safeguards agreement, similar to INFCIRC/153 model agreements. It entered into force on March 1994 after ratification by the Brazilian and Argentine Congresses.

The basic undertakings of the Quadripartite Agreement are:

- The acceptance by the State Parties of safeguards on all nuclear materials in all nuclear activities within their territories, under their jurisdiction or carried out under their control anywhere, for the exclusive purpose of verifying that such material is not diverted to nuclear weapons or other explosive devices.
- The IAEA, in its verification, shall take due account of the technical effectiveness of the SCCC.

Furthermore,

- The State Parties, ABACC and the IAEA shall co-operate to facilitate the implementation of the safeguards provided for in the Agreement.
- ABACC and the IAEA shall avoid unnecessary duplication of safeguard's activities.

The implementation of such complex safeguards system with its several interfaces – IAEA, ABACC, National Authorities and Operators – requires a great effort and cooperation of all parties involved. In particular, a close coordination between the IAEA and ABACC to avoid unnecessary duplication of efforts and to reach independent conclusions is extremely necessary.

With this objective "Guidelines for the coordination of routine and ad-hoc inspections between the IAEA and ABACC" were agreed upon and are being implemented. Also of high priority at this moment is the implementation of different agreements between the IAEA and ABACC on common use of containment and surveillance equipment (e.g. Cobra seals, EMOSS system), and measurement equipment (e.g. neutron detectors, radiation sources, etc.).

In 1997, 76 inspections were carried out in Argentine facilities and 66 inspections in Brazilian facilities. These inspections demanded an effort of 479 inspector-day in the field and an availability of 1096 inspector-day as follows:

Type of Inspection	Argentina	Brazil	Total
Verification or re-verification of design information (DIQ)	1	--	1
Physical Inventory verification (PIV)	39	31	70
Interim inspections	29	26	56
Accompanying inspections carried out by the IAEA	1	7	8
Permanent inspections (with duration of 21 days each)	6	--	6
Unannounced inspections	--	2	2
Total inspections	76	66	142
Inspection efforts (inspector-day)	352	127	479
Inspector availability (inspector-day)	774	322	1096

WHAT DOES A REGIONAL SYSTEM DO TO ENHANCE SAFEGUARDS

The practice of international safeguards can be strengthened by two means: by improving the ability to detect diversion of declared nuclear material or by strengthening the ability to detect non declared activities, especially related to the production of plutonium (Pu) and highly enriched uranium (HEU). Until recently, IAEA safeguards were limited – in practical terms – to the first case.

In 1995 the IAEA introduced new measures to strengthen its safeguards. These measures were divided into two parts: Part I put together all measures that could be introduced within the actual legal system and, therefore, were of quick implementation. Part II, known today as the Additional Protocol ^[3], is destined to detect non-declared nuclear activities and which requires additional legal measures.

As far as timing is concerned, it is important to highlight that both the SCCC and ABACC were established in 1991 and implementation thereof began in 1992. Although the system was structured to apply conventional safeguards, that is, to detect diversion of declared nuclear material in declared facilities, its safeguards approach never excluded the possibility of use or misuse of non-declared materials or facilities.

In view of the intention to strengthen international safeguards, improving the efficiency, a regional organization presents an advantage of controlling a small universe of facilities and material. A regional organization is not required to follow universal standard procedures as requested in an international system. Besides, the criteria and procedures are established on a case by case basis and are applied to each specific facility. Considering that the number of facilities is not high, both the efficiency and effectiveness of safeguards may be significantly increased.

Another relevant factor in this regard is that the mutual inspection system implemented by ABACC makes it possible to profit from the best professional expertise available in each of the two countries. In this case, the inspector has a higher knowledge of the installation controlled. This is difficult to attain in a universal system.

Neither the Bilateral Agreement nor the General Procedures of the SCCC hinder ABACC from implementing the concepts defined in Part I of the Program for Strengthening the IAEA Safeguards (Program 93+2). Information treatment on nuclear fuel cycle and the use of new technologies, for example, remote monitoring and environmental sampling are issues that ABACC has been currently studying and developing. In this sense, ABACC is participating in the international remote monitoring program, sponsored by the Department of Energy of the United States (DOE) where data from Embalse Nuclear Power Plant in Argentina is transmitted to ABACC headquarters in Rio de Janeiro. Also, ABACC has followed the IAEA in the collection of swipe samples in Brazilian and Argentine facilities and has incorporated this technique into its safeguards approaches.

The same objectives set forth in the Additional Protocol to safeguards agreements could be reached by a regional system, which would use simple techniques for its implementation at a lower cost. However, the signing of this document will require some time until the Governments of Member States of the IAEA and respective Parliaments authorize to put it into practice. Nevertheless, it will be necessary that Argentina and Brazil define the role they expect ABACC to play with regard to the mentioned Protocol.

CONCLUSIONS

From the Brazilian and Argentine points of view, it may be concluded that the implementation of the Bilateral and Quadripartite Agreements represented a considerable impact on the load of work of the National Authorities and Operators. To optimize the implementation of safeguards a close and better coordination between ABACC and the IAEA is required. In fact, the implementation of a regional system cannot penalize countries that are making special safeguards efforts to provide a higher level of confidence both to themselves and to the international community.

Nevertheless, each organization should be allowed to reach independent conclusions. For this purpose, ABACC and the IAEA should work jointly, whenever feasible, according to compatible safeguards criteria of the two organizations.

Considering the short time of implementation of the Quadripartite Agreement and the first results of the cooperation between ABACC and the IAEA, which are reflected in the agreed "Guidelines for the Coordination of Routine and Ad-hoc Inspections between the Agency and ABACC" and in agreements for the common use of different equipment, further improvement in the relationship of the two agencies is expected in the near future.

A regional system may contribute in many ways to enhance the safeguards. The more relevant are:

- to improve the effectiveness and efficiency of safeguards by sending as inspectors who are experts in the process involved in the installations that are to be inspected;
- to have much more information on nuclear activities in each of the two countries than it is available to the IAEA; and
- to maintain formal and informal channels of communication.

To implement the Additional Protocol it is first required that the Parties (Brazil and Argentina) take the political decision to apply it and, at the same time, define the role of ABACC in its application. Also in this case, the advantages of a regional system listed above would permit to reach the same objectives of the Protocol with easier implementation measures and at lower costs.

REFERENCES

[1] "Agreement between the Republic of Argentina and the Federative Republic of Brazil for the Exclusively Peaceful Use of Nuclear Energy". INFCIRC/395. IAEA, Vienna, November 1991.

[2] "Agreement between the Republic of Argentina, the Federative Republic of Brazil, the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials and the International Atomic Energy Agency for the Application of Safeguards". INFCIRC/435. IAEA, Vienna, March 1994.

[3] "Model Protocol Additional to the Agreement(s) between State(s) and the International Atomic Energy Agency for the Application of Safeguards". INFCIRC/540. IAEA, Vienna, September 1997.

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