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ABACC'S SAFEGUARDS - STATUS OF IMPLEMENTATION

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Abstract

Since July 1992 the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials (ABACC) is applying a full scope safeguard system in both countries. A Quadripartite safeguard's agreement was signed between Argentina, Brazil, ABACC and the IAEA that entered into force in March 1994. After a brief description of the SCCC and the type and quantity of facilities involved, a summary of the status of implementation of the Quadripartite agreement is presented.

1. Introduction

The Bilateral Agreement between the Republic of Argentina and the Federative Republic of Brazil for the Exclusively Peaceful Use of Nuclear Energy /1/ is in force since December 1991. To verify the control's commitment of the Agreement the Brazilian-Argentine Agency of Accounting and Control of Nuclear Materials (ABACC) was created. The ABACC's objective is to apply a full scope safeguard's system in both countries, called the Common System of Accounting and Control of Nuclear Material (SCCC), with the purpose of verifying that all nuclear materials in all nuclear activities are not diverted to the manufacture of nuclear weapons or other nuclear explosive devices. The organization of ABACC and the characteristics of the safeguard's system have been described in previous papers /2,3/.

On March 1994 entered into force a Quadripartite Agreement /4/ among Argentina, Brazil, ABACC and the International Atomic Energy Agency. This Agreement, though similar to those based on the INFCIRC/153 model, takes into account the Bilateral Agreement and, therefore, the SCCC and ABACC. The Quadripartite Agreement called for a close coordination between the IAEA and ABACC that, while avoiding unnecessary duplication of efforts, shall allow each Agency to fulfill its responsibilities and to reach independent conclusions.

2. ABACC and the implementation of the SCCC

Table 1 describes the present situation of facilities and other locations in both countries.

The Secretariat of ABACC started its operation in July 1992. The Initial Report on the inventories of nuclear material in all nuclear activities in each State Party was received on September 92. Considering that both countries had at that time nuclear material under IAEA safeguards (INFCIRC/66 type agreements), the Secretariat decided to concentrate the initial efforts on the nuclear material submitted only to the SCCC. A detailed description of the activities carried out during the second half of 1992 and 1993 has been presented in previous papers [3], [5].

Type	Argentina	Brazil	Total
Conversion facilities	7	1	8
Enrichment facilities	1	2	3
Fuel fabrication facilities	3	1	4
Power reactors	2	1	3
Research reactors	6	3	9
R&D facilities	1	3	4
Critical/sub critical units	-	3	3
Storage facilities	3	2	5
LOFs on fuel research	3	5	8
LOFs on reproc.research	-	1	1

LOFs analytical lab.	3	2	5
Other LOFs	8	6	14
total	37	30	67

Table 1: Facilities and LOFs in Argentina and Brazil

The activities performed until December 1995 can be summarized as follow:

- **Accounting**: Initially, the records and reports system under use by the Parties was compatible with INFCIRC/66. The changing from the previous system to the new one foreseen in the SCCC (compatible with INFCIRC/153 type agreements) was made by steps and was fully implemented by March 1994.

- **Design Information Verification**: The examination and verification of almost all design information have been done and a process of updating and improving DIQs is under way.

- **Inspections**: Table 2 presents the number and type of inspections that were carried out by ABACC in compliance with their objectives.

- **Technical Support**: Portable equipment for inspection was procured by the end of 1992 and this initial inversion was expanded during 1993 and 1994, also a whole system for using metallic seals was implemented. Studies for the procurement of facility specific equipment started in early 1994, and in some cases a conceptual design was elaborated. The system for DA analysis was established based on a net of laboratories in both countries. In addition, reference material and standards both for DA and NDA were procured or developed. In order to verify the quality of the analysis of samples, a inter-comparison laboratory program was established.

Inspections	1992	1993	1994	1995
DIQ Verification	6	11	73	5
Initial Inventory, PIV and interim verifications	5	24	113	139

Total inspection	11	35	186	144
Inspection efforts (persons-day)	28	106	562	683
inspectors (persons-day)	114	373	1506	1489

Table 2: ABACC's inspections

- **Training**: A seminar for ABACC inspectors was carried out in each country in the second half of 1992, and in June 1993, a training course was organized by the Argentinean National Authority, supported by ABACC. Another training course supported by ABACC was organized in September 1994 by the Brazilian National Authority. These training activities were carried out mainly by experts from the National Authorities and ABACC with a significant support of lecturers from other countries (USA and France) and Safeguards Organizations (IAEA and EURATOM). In addition, a program of specific workshops started in 1994, the first one took place at a fuel fabrication plant in Argentina in February 1995. In this case under an action sheet of a cooperation agreement between the DOE (USA) and ABACC. In August 1995 ABACC has organized a training course for ABACC's inspectors in each country on audit of records and reports. Other training activities are planned for 1996.

Planning and Evaluation: The evaluation of the results of inspection is continuously performed. The activities in this area were initially concentrated in the discussion of basic criteria and guidelines aimed at supporting design verification and inspections. The drafting of 24 facility attachments, the initiation of discussion on the coordination of activities with the IAEA, and bilateral and trilateral discussions on "ad hoc" procedures for the enrichment facilities, were the main activities done in 1994. The coordination of activities, discussions on "ad hoc" safeguards procedures with the IAEA and the negotiations of facility attachments play at present a central role in this area.

From the practical experience obtained in implementing the SCCC and the ABACC, several singular aspects can be appointed out:

- As the inspection staff is formed not only by safeguards' experts but also by experts on design and on operation of installations, the Secretariat designs generally an inspection team formed by a safeguard expert and an expert on the type of facility to be inspected. As

consequence, it is more effective the verification that the facility is operating as declared initially by the operator.

- A facility operator who performs an inspection in the other country will understand better the difficulties of the safeguard's implementation in this type of facility, and after the inspection will try to improve the safeguards' elements in its own facility (record and report systems, measurement systems, etc.). This feedback is significant to improve the application of the control system.

- The technical cooperation between the two countries encompasses several applications of nuclear energy. As consequence the people that are involved in the various applications are knowing by the other country. This fact is important to increase the confidence and the effectiveness of the control.

- Many of the installations under safeguards are research and development facilities, laboratories and other locations, which have frequent changes of design, use several forms of nuclear material and do not operate in a routine basis. Furthermore many of them were not designed considering elements of safeguards. As consequence, the effort applied initially in those areas has no relation with the nuclear material inventory, that in general is very small.

- As the inspectors do not work full time to the Secretariat of ABACC, the preparation of inspection reports is a very important step. The reports have to be detailed and completed in order to enable a follow-up of solution of discrepancies and anomalies and to guaranty the continuity of the knowledge of the situation. As consequence, a considerable fraction of the inspection effort is expended in the ABACC's Headquarters.

3. ABACC and the Quadripartite Agreement

The bilateral Agreement was supplemented by the Quadripartite Safeguard's Agreement, signed by the two governments, ABACC and the IAEA on 13 December 1991 in Vienna, Austria [8]. Under this agreement the IAEA also takes the responsibility for applying full scope safeguards in Argentina and Brazil. The Quadripartite Agreement entered into force on 4 March 1994.

The agreement's basic undertakings are the acceptance by the State Parties of safeguards, in accordance with the terms of the agreement, 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 in not diverted to nuclear weapons or other explosive devices.

In addition, the agreement states that the IAEA shall have the right and the obligation to ensure that safeguards will be applied on all nuclear materials in all nuclear activities within the territories of the States Parties, 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 device.

ABACC undertakes, in applying its safeguards on nuclear material in all nuclear activities within the territories of the States Parties, to co-operate with the Agency, in accordance with the terms of the Agreement, with a view to ascertaining that such nuclear material is not diverted to nuclear weapons or other explosive devices.

The agreement further states that the IAEA shall apply its safeguards in such a manner as to enable it to verify, in ascertaining that there has been no diversion of nuclear material to any nuclear weapon or other nuclear explosive device the findings of the SCCC. The IAEA verification shall include, inter alia, independent measurements and observations conducted by the Agency, in accordance with the procedures specified in the Agreement. The IAEA, in its verification, shall take due account of the technical effectiveness of the SCCC. Moreover, the agreement states that the States Parties, ABACC and the IAEA shall co-operate to facilitate the implementation of the safeguards provided for in the Agreement; and that ABACC and the IAEA shall avoid unnecessary duplication of safeguards activities.

The Quadripartite Agreement is similar to INFCIRC/153, with some particularities that were introduced mainly due to the existence of the SCCC and ABACC. The Quadripartite Agreement incorporates provision of information to the IAEA on the imports of any nuclear material that has not reached the starting point of safeguards. Nuclear material subject to the Quadripartite Agreement shall not be exported unless such material will be subject to safeguards in the recipient State and until the Agency has made appropriate arrangements to apply safeguards to such material.

The General Part of the Subsidiary Arrangements to the Quadripartite Agreement entered into force on the same date of the Agreement (4 of March 1994). Some particularities can also be found in this document, such as the provision for ABACC to send periodically to the Agency, information on the scope of its inspections, inspection reports, etc. The Subsidiary Arrangement incorporates the provision, on a co-operative basis, of information on preliminary construction plans for new facilities using design information questionnaire format as guidance.

There is an entire code dealing with arrangement between ABACC and the Agency for co-operation in the application of safeguards under the Agreement. In implementing these arrangements both Agencies shall be guided by the following principles: a) the need to reach its own independent conclusions, b) the need to coordinate to the extend possible their activities for the optimum implementation of the Agreement and in particular to avoid unnecessary duplication of ABACC's safeguards. Also, when performing their activities, ABACC and the IAEA shall work jointly, whenever feasible, according to compatible safeguards criteria of the two Organizations.

The verification of the Initial Report by the IAEA started in June 1994 after several coordination meetings aimed at to establish some "ad hoc" rules to facilitate these activities. For most facilities previously under IAEA safeguard (INFCIRC/66), ABACC carried out the verification of the initial inventory simultaneously with the IAEA. This activity was performed mostly through several teams of inspectors working in both countries. By March 1995 practically al the initial inventory has been verified. The Agency's conclusion of verification's activities has not yet drawn and at present time Agency's teams are analyzing the consistency of the initial report information in both countries.

To the extend possible, the verification of DIQs was combined with the verification of the Initial Report. At present, conditions are such that drafting and negotiations of facility attachments can be speeded up. Some drafts of facility attachments were already distributed by the IAEA to ABACC and the State Party concerned. The first negotiation meetings have occurred in June 1995. ABACC has already provided to the IAEA a proposal of draft of facility attachments for all facilities and LOFs not previously under IAEA safeguards.

After the verification of the Initial Report, a regime of "ad hoc" inspections has been implemented. Almost all inspections are carried out on coordinated dates by both organizations and some practical arrangements on the field have been implemented.

Several levels of coordination are considered in the General Part of the Subsidiary Arrangements, that when fully implemented shall allow an effective application of safeguards by both Agencies avoiding the unnecessary duplication of efforts. ABACC and the Agency shall meet to discuss safeguard's implementation and co-ordination matters as necessary and normally once every two years. A first co-ordination's meeting was held in Vienna in February 1995. As result, a draft of the first guidelines for the coordination of safeguards activities (non duplication of surveillance equipment, sealing on nuclear material, etc.) was discussed. A second co-ordination's meeting was held at ABACC's Headquarters in November 1995. The main subject was the fact that the Agency not yet approved the guidelines discussed in the first meeting. ABACC recognized that there was some improvement in the relationship of the two agencies at operational level. However ABACC appointed out that the provisions of the Quadripartite Agreement are not fully implemented, and that almost all activities are at present being duplicated.

4. 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/ A. Biaggio, O. Mafra, M. Marzo and R. Nicolas, "A Good Nuclear Neighbors Relationship", Proceedings of the 15th ESARDA Annual Symposium, Rome, Italy, May 1993, EUR 15214, ESARDA 26, p.163-165.

/3/ M. Marzo, A. Biaggio and A. Raffo, "Nuclear Co-operation in South America: The Brazilian-Argentine Common System of Safeguards", IAEA Bulletin, 3/1994, p.30-35, Vienna, 1994.

/4/ 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.

/5/ J. Coll, "The Role of a Regional Organization in the Application of Safeguards - the Example of ABACC", Proceedings of International Nuclear Safeguards 1994: Vision for the Future, Vienna, 1994, IAEA-SM-333/204, vol. 1, p.71-79.