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**REGIONAL ARRANGEMENTS: NUCLEAR-WEAPON FREE ZONES AND ABACC**

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**ABSTRACT**

Argentina and Brazil taken in last 15 years several measures that resulted in the full incorporation of the two countries into the nuclear non-proliferation regime. The basic step for this development was a Bilateral Agreement for the Exclusively Peaceful Uses of Nuclear Energy. A joint nuclear material accounting and inspection system administered by ABACC was implemented. This paper summarizes the main developments that lead to the close co-operation between the two countries.

**1. INTRODUCTION**

The Argentine Republic and the Federative Republic of Brazil together constitute a region in South America that covers more than 11.2 million square kilometers and is populated by about 200 million inhabitants. The Gross Domestic Product (GDP) of the region has risen to over \$1,000 billion, approximately 55% of the GDP of Latin America and the Caribbean, although its population accounts for only 35% of this geographical area. Both countries, together with Uruguay and Paraguay, belong to the Mercosur South American Common Market, which has been in operation for the last 14 years.

Nuclear cooperation between Argentina and Brazil began during the 1960s and remains in full force today. Although their cooperation was not as complete as it might have been during the 1960s and 1970s, it nevertheless grew stronger after 1980, when political conditions established by the resolution of controversies concerning the use of water resources led to the signing of an Agreement on the Peaceful Uses of Nuclear Energy between the two countries. The implementation of this Agreement proposes joint development in various fields of nuclear energy, including the production of radioisotopes by cyclotron, the development of isotopic standards, radiological protection and nuclear safety, and the recycling of fuel elements.

As a natural outcome of this cooperation and of the wish to make their nuclear programs transparent, many commitments to the exclusively peaceful uses of nuclear energy have been undertaken by both nations. These commitments were formulated in various joint declarations on nuclear policy by the Presidents of Brazil and Argentina: Foz de Iguassu, 1985; Brasilia, 1986; Viedma, 1987; Iperó, 1988; Ezeiza, 1988; and the Joint Statements of Buenos Aires and Foz de Iguassu, 1990. The policies outlined in these declarations finally led to signature of a Bilateral Agreement on the Exclusively Peaceful Uses of Nuclear Energy on 18 July 1991. This Bilateral Agreement entered into force on 12 December of the same year, after ratification by the Congresses of both countries. (It should be noted that said ratification implies its promulgation under force of law as established under the Agreement, and that this law imposes mandatory common compliance of both countries.) The Bilateral Agreement sets up the Common System of Accounting and Control of Nuclear Materials (SCCC) and the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials (ABACC).

On the basis of this Bilateral Agreement, a Quadripartite Safeguards Agreement was signed in December 1991 by the Republic of Argentina, the Federative Republic of Brazil, the ABACC, and the International Atomic Energy

Agency (IAEA or the Agency). This Agreement is a comprehensive safeguards agreement and entered into force in March 1994 after its ratification by the Congresses of both countries.

In May 1994, the two countries brought into force the Treaty of Tlatelolco, which established a nuclear-weapons-free-zone in Latin America. Argentina and Brazil joined the Non-Proliferation Treaty (NPT) in February 1995 and July 1998, respectively. The Quadripartite Agreement was considered valid by the IAEA for complying with NPT requirements. Both countries are signatories of the Comprehensive Nuclear Test-Ban Treaty (CTBT), Missile Technology Control Regime (MTCR), Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction (CWC Chemical Weapons Convention) and Biological and Toxin Weapons Convention (BTWC). Both countries also belong to the Nuclear Suppliers Group since 1996.

## **2. THE BILATERAL AGREEMENT**

The basic undertakings of the Bilateral Agreements are as follows:

- (a) To use nuclear materials and facilities under their jurisdiction or control exclusively for peaceful purposes.
- (b) To prohibit and to prevent in their 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.
- (c) As no technical distinction can be made between nuclear explosives for peaceful purposes and those for military purposes, the Parties also undertake to prohibit and prevent in their 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 explosive device while the above-mentioned technical limitation exists.
- (d) As a basic control undertaking, the Parties agree to submit all nuclear material in all nuclear activities carried out in their territories or anywhere under their jurisdiction or control to the Common System of Accounting and Control of Nuclear Materials (SCCC).

The Agreement also establishes that any serious noncompliance by either of the Parties gives the other Party the right to terminate the Agreement or suspend its application, as a whole or in part, upon notification to the Secretary General of the United Nations and to the Secretary General of the Organization of American States.

## **3. THE COMMON SYSTEM OF ACCOUNTING AND CONTROL OF NUCLEAR MATERIAL**

The Agreement establishes the SCCC with the purpose of verifying that nuclear materials in all nuclear activities of the Parties are not diverted to uses not authorized under the terms of the Agreement.

The basic principles of the System are established in the document *General Procedures of the SCCC*, and the main documents for its implementation are the *Application Manuals*. This latest set of documents applies to each facility or location outside of a facility (LOF) and contains facility-specific safeguards procedures, which are negotiated between the ABACC and the concerned State Party, similar to the IAEA Facility Attachments.

*General Procedures of the SCCC* is composed of four chapters and two annexes. Paragraphs 1, 2, and 3 of the first chapter define the starting point and specify the conditions for termination and exemption of the application of the SCCC. Paragraph 4 contains the basis for establishing the level of accounting and control to be applied by the ABACC. It specifies that the appropriate level of accounting and control for a specific facility or other location shall be reflected in its *Application Manual*, as a result of the analysis of the category of nuclear material, the facility annual throughput or inventory, and the conversion time. The annual inspection frequency for each facility and other location shall also be specified in the appropriate *Application Manual*, and is determined by taking into account the same parameters as above and the significant quantity. This paragraph further establishes that nuclear material accountancy shall be based on measurement system compatible with the international standards and conforming to the objective of the SCCC.

Chapter II establishes the conditions, with respect to nuclear material accountancy and control, to be fulfilled by the operators in each State Party for the licensing of activities involving the storage, production, processing, or

use of nuclear materials. As a first condition, the facility operator shall submit to the appropriate State Party Authority the necessary information to permit the application of the SCCC and any modification thereto. According to paragraph 1, this information shall include, at least, the characteristics, purpose, features of relevance for containment and surveillance measures, nominal capacity and layout of the facility or other location, the description and flow sheet of the nuclear material, the description of the measurement system, and the proposed procedures for accountancy and control of nuclear material. The general requirements for accounting and operational records to be maintained by the facilities and other locations are stated in paragraph 2. Paragraphs 3 and 4 determine that the procedures and frequency for physical inventory taking and the specific requirements for the measurement system shall be established in the appropriate *Application Manual*.

Chapter III contains the procedures for application of the SCCC at state level. Paragraphs 1 and 2 establish that the operator shall submit inventory change reports, material balance reports, physical inventory listings, special reports, and notification on transfers of nuclear material to the appropriate State Party Authority. The report formats are described in Annex I of the *General Procedures of the SCCC* and the frequency and timing of submission of those reports are established in the appropriate *Application Manual*. Notification shall be submitted thirty days in advance for any international transfer and for national transfers exceeding one effective kilogram of nuclear material and not foreseen in the *Application Manual*, and upon shipment in case of all other national transfers. Paragraphs 3 and 4 contain the obligation for the State Party Authority to maintain centralized records which permit determination of the inventory per category of nuclear material in each material balance area (MBA) and establish that the national inspections shall contribute to achieving the objectives of the SCCC. The right for national inspectors to accompany the ABACC inspections is also foreseen.

Chapter IV refers to the provisions for the application of the SCCC by the ABACC. Paragraph 1 determines that the State's Party shall submit to the ABACC the *Technical Questionnaire* (and any modification thereto) for each facility and other location. It shall contain the information already specified in paragraph 1 of Chapter II as well as any other information with respect to the facilities and other locations that may be necessary for the application of the SCCC, with a reservation for sensitive information, which may be examined at places indicated by the State Authority. The ABACC may send inspectors to the facilities and other locations to verify the information described in the *Technical Questionnaires*. Paragraphs 2 and 3 determine that the State Authority shall provide ABACC with routine and special reports and with advance notification on transfers of nuclear material.

Inventory change reports for each MBA shall be submitted within twenty days after the end of the month in which the inventory change occurred or was established, and material balance reports and physical inventory listings shall be submitted within twenty days after the physical inventory has been taken. Notifications shall be provided with respect to international and domestic transfers, which exceed one effective kilogram of nuclear material, at least twenty days in advance of the date foreseen for the transfer. Paragraph 4 determines the timing and content of the notification on inspections; the purpose and scope of the ABACC's routine, ad hoc, and special inspections; the conditions for access of the ABACC inspectors during inspections; and the timing of the ABACC's notification of the results of each inspection. This chapter further contains provisions for the application of containment and surveillance measures, procedures for exemption and termination, general provisions on material unaccounted for, and shipper-receiver difference evaluations and special procedures for the application of the SCCC to nuclear material intended to be used for the propulsion or operation of any type of vehicle (including prototypes) or in other nonproscribed activities.

Chapters V, VI, VII, VIII, and IX refer to designation and conduct of the ABACC inspectors, routine communications, revision of the document, transitional arrangements, and definitions.

Annex I contains explanations for the preparation of accounting reports to be submitted to the ABACC, and Annex II defines the types and channels of routine communications resulting from the Bilateral Agreement, the Protocol on the Privileges and Immunities, and the *General Procedures of the SCCC*.

#### **4. THE BRAZILIAN-ARGENTINE AGENCY FOR ACCOUNTING AND CONTROL OF NUCLEAR MATERIALS**

To apply the SCCC in both countries, the Agreement also establishes the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials (ABACC). This Agreement endows the ABACC with the characteristics of an International Agency, and its employees assume the status of international staff. Their privileges and immunities are established in an additional protocol to the Agreement, in the corresponding Headquarters Agreement signed with the Government of Brazil, and in a special Agreement signed with the Government of the Argentine Republic.

The organs of the ABACC are the Commission, its governing body consisting of four members appointed by the Parties (each Government appointing two), and the Secretariat, its executive body.

The principal functions of the Commission are the following:

- To monitor the functioning of the SCCC;
- To supervise the functioning of the Secretariat, preparing instructions and directives as appropriate in each case;
- To appoint the professional staff of the Secretariat and to approve the appointment of auxiliary staff;
- To prepare a list of duly qualified inspectors from among those proposed by the Parties to carry out the inspection tasks entrusted to them by the Secretariat;
- To inform the Party concerned of any anomalies which may arise in the implementation of the SCCC—that Party shall then be obliged to take the necessary measures to rectify the situation;
- To inform the Parties of non-compliance by one of the Parties of the commitments made under the Agreement; and
- To approve the *General Procedures of the SCCC* and the *Application Manuals* after their negotiation by the Secretariat.

The main functions of the Secretariat are the following:

- To implement the directives and instructions issued by the Commission;
- To perform the necessary activities for implementation and administration of the SCCC;
- To act, under the mandate of the Commission, as the representative of the ABACC in its relations with the Parties and with third parties;
- To designate, from among those included in the list, the inspectors who will carry out the inspection tasks necessary for the implementation of the SCCC—taking into account that the inspectors who are nationals of one of the Parties should carry out inspections at the facilities of the other Party—and to instruct them in the performance of their duties;
- To receive the reports which the inspectors prepare on the results of their inspections;
- To evaluate the inspections in accordance with the appropriate procedures; and
- To inform the Commission immediately of any discrepancy in the records of either of the Parties which emerges from the evaluation of the inspections results.

The technical unit of the Secretariat is structured in four areas of responsibility; each area includes two professionals.

- The *Accounting area* is responsible for accountancy, reporting, data processing, and informatics;
- The *Area of Planning and Evaluation* is responsible for safeguards approaches, *Application Manuals* preparation and negotiation, and data evaluation;
- The *Operations Area* is responsible for the planning and performance of inspections and the inspectors' convocations and instruction; and
- *Technical Support* is responsible for instruments, measurement methods and techniques, and containment and surveillance logistics.

The present inspector's staff consists of about thirty inspectors from each Party. They are professionals from the safeguards area, employees of national safeguards authorities, or work at other official organizations in areas such as methods and techniques or design and operation of nuclear installations.

The inspections are performed in a cross-national basis: Argentine inspectors carry out inspections in Brazil and vice-versa. The inspectors do not work permanently for ABACC but are convened by the Secretariat whenever necessary. Inspectors, who have more experience in a particular type of facility, due to his/her routine job, are preferred for inspections in that kind of facility. This is one of the main advantages of this system since the experts are familiar with the type of facility to be inspected. The average level of relevant technical experience of the inspection staff is around 15 years. Another advantage of this staff of inspectors is the great responsibility they accept and assume in performing inspections in the name of their country.

Besides the inspection manpower, the Parties also provide technical support to the ABACC by means of consultants, working groups, services on sample analysis, and radiological protection. In fact, as conceived in the Bilateral Agreement, the implementation of the SCCC requires the strong participation of the safeguards national authorities. This is very positive because it requires a well-developed state system that, in turn, contributes to increasing the efficiency of the system itself.

The annual budget of ABACC is \$3 million, equally provided by the Parties. This amount does not include the inspectors' salaries, which are paid directly by the countries, nor the acquisition of equipment, which is treated under special arrangements. To date, approximately \$2 million has been allotted for equipment.

## 5. STATE OF IMPLEMENTATION

Table I describes the present facilities and other locations in both countries.

The Secretariat of the ABACC started its operations in July 1992. The initial report of the inventories of nuclear material in all nuclear activities in each State Party was received in September 1992.

**Table I. Facilities and LOFs in Argentina and Brazil**

Type	Argentina	Brazil	Total
Conversion facilities	5	2	7
Fuel fabrication facilities	4	1	5
Enrichment facilities	1	3	4
Power reactors	2	2	4
Research reactors	6	3	9
Research and Development facilities	3	3	6
Critical/sub critical units	-	4	4
Storage facilities	4	2	6
LOFs on fuel research	5	5	10
LOF analytical laboratory	4	2	6
Other LOFs	8	7	15
<b>TOTAL</b>	<b>42</b>	<b>34</b>	<b>76</b>

The activities performed by the Secretariat of the ABACC can be summarized as follows:

- Planning and Evaluation:** Evaluation of the results of the inspections is continuously performed. The activities in this area initially concentrated on discussions of basic criteria and guidelines aimed at supporting design verification and inspections. The drafting and negotiation of facility attachments, discussion of the coordination of activities with the IAEA, and bilateral and trilateral discussions on ad hoc procedures—including those for the enrichment facilities—play a central role in this area.
- Accounting:** Early in its operations, the ABACC started development and implementation of the automated accounting system for personal computers that was practically completed in the second semester of 1996. During this period (1992-1996), ABACC received the accounting reports and sent them to the IAEA in hard copy. In the beginning of 1997 ABACC started to receive the accounting reports from the National Authorities in electronic media (diskette) and to send them to the IAEA. This allowed them to accelerate and automate the processing of accounting reports and to reduce the delay between the receipt of reports by ABACC and the shipment to the IAEA from about 8 working days in 1994 to 2 in 1997. To improve the promptness and security of the accounting reports, ABACC decided to use encrypted e-mail. This decision allowed them to replace progressively the conventional means of exchange correspondence (standard mails, fax, special courier, etc.) with the National Authorities. This methodology was fully implemented in September 1999. Currently, more than 90% of the official correspondence is exchanged using encrypted e-mail. In January 2000 the

procedure for sending the accounting reports to the IAEA by encrypted e-mail was adopted as the unique way to send the accounting reports to the IAEA. In 2003, the updating of ABACC's databank of accounting registers involved processing 2572 lines of inventory changes and 3715 lines related to nuclear material inventory, which correspond to 464 reports from the State Parties. The data collected during the 93 auditing performed in the course of inspections were utilized to update the database of register auditing, which involved processing 210 lines of inventory data and 1059 lines of updating of accounting data.

To adequately verify the operator's accountancy, the ABACC developed its automated data processing system. The database includes data on nuclear material measurement and inspection reports and it is able to perform several consistency checks.

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

**Table II. ABACC's inspections**

<b>Inspections</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>
Design information verification	15	-	1	2	1
Physical inventory verification (PIV)	49	49	42	47	50
Interim inspections	69	62	72	56	57
Total inspections	133	111	115	105	108
Inspection effort (persons-day)	449	369	379	373	400

- **Technical Support:** The ABACC started acquiring portable equipment for inspection by the end of 1992, and this initial inversion was expanded during 1993 and 1994. A system for using metallic seals was also implemented. Studies for the procurement of facility-specific equipment started in early 1994, and in some cases a conceptual design was elaborated. The ABACC started acquiring its own surveillance equipment in early 1996. Since 1998 the ABACC has been using its own surveillance equipment at an enrichment facility and at two Nuclear Power Plants.
- **Destructive Measurements:** As foreseen in the Bilateral Agreement, the Parties provide services for sample analysis. The system for destructive analysis (DA) was established based on a net of laboratories in both countries and both reference material and standards for DA were procured or developed. To verify and maintain the quality of the sample analysis, intercomparison exercises are performed periodically. In 2003, approximately 40 samples were taken during inspections for DA.
- **Training:** The ABACC periodically organizes training courses for inspectors in both countries. A series of workshop on auditing procedures, non-destructive analysis (NDA) measurements, PIV activities, remote monitoring, surveillance systems, environment sampling and information treatment has been organized. These training activities are carried out mainly by experts from the National Authorities and the ABACC, with significant support from lecturers from other countries (USA and France) and Safeguards Organizations [the IAEA and the European Atomic Energy Agency (EURATOM)]. In particular, since 1994, in the framework of a cooperation agreement with the United States Department of Energy (DOE), a series of workshops and hands-on training for ABACC inspectors has been organized.
- **Technical cooperation:** The ABACC has cooperation agreements with several organizations (IAEA, EURATOM) and countries (Argentina, Brazil, France, Republic of Korea, USA). These agreements include cooperation on inspectors' training and on several safeguards' areas. The Cooperation Agreement between the US DOE and ABACC entered into force on April 18, 1994 for a period of five years and was extended on May 21, 1999 for an additional five-year period, and automatically renewable for further five-year periods thereafter. The Agreement covers the cooperation in the areas of exchange of information, equipment, funding or personnel, exchange or loan of materials, equipment and components for evaluation and testing, joint projects

for research, development, testing and evaluation of nuclear material control, accountancy, verification, and advanced containment and surveillance technologies, techniques, or procedures.

## 6. ABACC's SAFEGUARDS OPERATION

Considering the basic concepts—significant quantities, timely detection, and a reasonable degree of certainty, the ABACC is applying the criteria and procedures established in the SCCC. In addition, criteria and procedures are applied to define specific technical criteria and safeguards measures for the control of a given nuclear material at a given facility. The safeguards' basic criteria and procedures employed by the ABACC do not constitute a rigid set of rules. Each specific case is studied, and a set of suitable, specific technical criteria and control measures are established, taking into account the characteristics of the nuclear activities in each country. This approach, although time consuming, allows the ABACC to introduce improvements when necessary. In addition, this also allows the incorporation of new safeguards technologies being developed that may have considerable impact on increasing the effectiveness of safeguards.

Diversion strategies are formulated considering, inter alia, the diversion of declared material, the eventual use of diverted material in an undeclared facility, the introduction of undeclared material or change in the composition of materials, and concealment methods. For each specific case, goals are defined and an evaluation is made of diversion hypotheses, diversion paths (and countermeasures), and diversion rates (both abrupt and protracted diversions are considered). Additionally, the actual or potential relations of the facility under study with other facilities are taken into account.

The ABACC's safeguards measures include the verification of the continued validity of the information described in the *Technical Questionnaires*, independent verification of the inventory and flow of nuclear material, verification of the operator's accountancy and measurement systems, and the use of containment and surveillance measures. The level of control for each facility, including the inspection frequency, is established considering the following variables: characteristics of the facility, category of the nuclear material (taking into account the relevance of the isotopic composition), conversion time, inventory, and production time (linked to the facility throughput). In addition, the quality of the measurement system, the application of containment and surveillance, and the material accessibility are factors that could affect the inspection frequency or the inspection's scope. The inspection goal quantities are usually established by considering the type of facility (item or bulk) and the maximum inventory, or the throughput. The intervals of time between inspections are established by considering the nuclear material production time, the conversion time, and the safeguards approach for each facility.

The first evaluation of the results obtained from an inspection is performed by the inspectors themselves. The inspection report has to contain their comments and conclusions about the verification activities—including judgments about the appropriateness of these activities and the safeguard approach—as well as recommendations about resolved or unresolved discrepancies. The inspectors also have to recommend additional actions when necessary. For ABACC, this is a fundamental stage in the control system and requires the inspector to have technical knowledge and an ability to make judgments. From the beginning, the ABACC has been fully aware of the key role played by well-trained inspectors in the field. Because the inspectors are not part of the permanent staff of the ABACC, their work has to be very detailed and conclusive to ensure the follow-up of activities performed during the inspection.

The ABACC inspectors' activities may be divided into pre-inspection, inspection, and post-inspection activities. Pre-inspection activities are performed at the ABACC headquarters when the ABACC's operations unit informs the inspectors about the MBAs to be inspected, their operational status, and the possible existence of pending subjects or discrepancies. At that time, they discuss the inspection plan, measurements to be made, and a sampling plan. The accounting unit of the ABACC provides the inspectors with the working papers for records auditing—the inventory as it was checked in a previous inspection, the inventory changes, and the current inventory (when applicable)—to be verified in the present inspection. The inspectors receive all the material necessary for the inspection, such as seals, sampling flasks, dosimetric films, and measurement equipment.

To coordinate the workings of the ABACC and the Agency during each inspection, an inspection mission meeting takes place in the ABACC headquarters. The ABACC and IAEA inspectors meet to discuss and define the detailed inspection program for that mission and the inspection activities to be performed in each MBA. This includes the distribution of tasks, advance information on inventory changes for verification purposes, instrument logistics, sample handling, and follow-up actions, as well as travel arrangements and schedules to be followed by the inspector teams from the two organizations.

Inspection activities include, in general, the auditing of the records and comparison with reports, based on the working papers previously prepared in headquarters; counting and identification of an item; weighing and non-destructive assay, according to the sampling plan; follow-up action; verification of the operator's measurement system; sample-taking; seals examination, application and exchange; and surveillance service and review. The post-inspection activities may include a meeting with the IAEA inspectors to discuss or review matters that may have arisen during the inspection. Inspection reports are prepared independently by the inspectors of each organization.

A second level of evaluation is performed in the ABACC's headquarters. It includes the overall evaluation of the inspection report/results, and has basically two purposes:

- (1) To evaluate the material balance for a given period, especially in the case of relevant bulk facilities, through the known methods material unaccounted for (MUF) evaluation, MUF-D, etc.;
- (2) To analyze the conclusions about the verification activities for an individual MBA in the context of the conclusions obtained from other MBAs (especially in the case of MBAs that have a close relationship), and to do so for the entire country.

Following these evaluations, the National Authority is notified about the conclusions of the verification activities.

When justified, for a given period of time, an in-depth evaluation of consistency may be made for a given facility, that takes into account inspection reports and results, accounting reports, characteristics of the facility, and the fuel cycle.

All discrepancies are followed up immediately, with the urgency being related to the type and quantity of the nuclear material involved and the strategic importance of the facility (or facilities) concerned. Unresolved discrepancies could constitute an anomaly and may trigger a specific sequence of actions. An anomaly is reported to the ABACC's Commission.

## **7. THE QUADRIPARTITE AGREEMENT**

The Bilateral Agreement was supplemented by the Quadripartite Safeguards Agreement (INFCIRC/435), signed by the two governments, the ABACC, and the IAEA on 13 December 1991 in Vienna, Austria. Under this agreement, the IAEA also takes responsibility for applying comprehensive safeguards in Argentina and Brazil. The Quadripartite Agreement came into force on 4 March 1994.

The Agreement's basic undertaking is 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 is not diverted to nuclear weapons or other explosive devices.

The ABACC undertakes, in applying its safeguards to nuclear material in all nuclear activities within the territories of the States' Parties, to cooperate 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 devices.

The Quadripartite Agreement further states that the IAEA shall apply its safeguards in such a manner as to enable it to verify the findings of the SCCC. The IAEA verification shall include, inter alia, independent measurements and observations conducted 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, the 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 because of the existence of the SCCC and the ABACC. The Quadripartite Agreement incorporates provision of information to the IAEA on the import of any nuclear material that has not reached the starting point of safeguards. Nuclear material subject to the 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 March 1994). Some particularities can also be found in this document, such as the provision for the ABACC to periodically send information on the scope of its inspections, inspection reports, etc. to the Agency. The Subsidiary Arrangement incorporates the provision, on a cooperative basis, of information on preliminary construction plans for new facilities using the IAEA's design information questionnaire (DIQ) format as guidance. There is an entire code dealing with arrangements between the ABACC and the Agency for cooperation in the application of safeguards under the Agreement. In implementing these arrangements, both Agencies shall be guided by the following principles: the need to reach their own independent conclusions and to



coordinate, to the extent possible, their activities for the optimum implementations of the Agreement and, in particular, to avoid unnecessary duplication of the ABACC's safeguards. Also, when performing their activities, the ABACC and the IAEA shall work jointly, whenever feasible, according to compatible safeguards criteria of the two organizations.

Significant advances were made in the negotiation of facility attachments. As of December 2003, forty-nine facility attachments are in force and 12 are under active negotiation.

## **8. COORDINATION OF ACTIVITIES BETWEEN THE ABACC AND THE IAEA**

Several levels of coordination between the ABACC and the IAEA are considered in the Quadripartite Agreement and its General Part of the Subsidiary Arrangements. A significant improvement in the cooperation was obtained with the approval of the document *Guidelines for Coordination of Routine and Ad Hoc Inspection Activities between the Agency and ABACC*. The guidelines described in this document provide guidance on the initial coordination of activities of the two agencies. They will be reviewed and amended, as appropriate, in the light of changing circumstances and developments of, inter alia, new safeguards measures on the part of the IAEA, the ABACC's capabilities, technical effectiveness and functional independence, the need to appropriately apportion the financial burden of shared activities, and changes in the general situation.

Based on these Guidelines, nineteen sets of common procedures for the use of safeguards equipment have already been established. Both agencies agree in advance to the safeguards equipment acquisition planning. Significant cooperation was also achieved on the preparation of joint inspection guideline documents for specific facilities. The texts of three joint inspection guideline documents have been agreed (two light water reactors and a fuel fabrication plant) and four are under discussion (two on-load reactors, a fuel fabrication plant and a conversion plant). ABACC/IAEA arrangements for unannounced inspections and for swipe sampling at two enrichment facilities were agreed upon by both organizations.

## **9. CONCLUSIONS**

The description of the efforts made by Brazil and Argentina to set up a Common System for Accounting and Control of Nuclear Materials, the inception of the ABACC to administer it, and the level of implementation achieved over the short period of time available, show the possibility of successfully establishing regional systems for the application of safeguards.

The signature of the Quadripartite Agreement and the progress achieved with the IAEA in the implementation thereof emphasizes the feasibility of these systems playing a major role and contributing to the efficiency, effectiveness, and success of the universal safeguards system.