ANNUAL REPORT

2002

ABACC

ABACC

Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials

2002 Annual Report

Table of Contents

First of all, I want to highlight that the activities related to the verification of nuclear materials performed by the Secretariat during 2002 did not reveal any non-compliance by the Republic of Argentina or the Federative Republic of Brazil with their basic express commitments under the Bilateral and Quadripartite Agreements.

In 2002, ABACC completed its first ten years in the successful application of safeguards and the regional system attained a high technical level that guarantees the vocation by both Argentina and Brazil to maintain the transparency of their programs, which are focused, exclusively, at the peaceful use of nuclear energy.

The regional system managed by ABACC was also extended during this year with the beginning of construction of the commercial uranium enrichment plant by *Indústrias Nucleares do Brasil (INB)* at the municipal district of Resende, State of Rio de Janeiro. As of April 2002, this gave rise to meetings and exchange of information among the International Atomic Energy Agency (IAEA), the National Authority, the Operator and ABACC, aimed at analyzing the introduced data and at laying out the safeguards approach to be applied in this plant.

As it has occurred during the last few years, one of the priorities of the Secretariat was upgrading and enhancing its coordination and cooperation activities with the IAEA in the application of safeguards. Some examples to be noted with regard to this joint effort are the performance of the first unannounced inspection to the Pilot Uranium Enrichment Plant (USIDE) by ABACC and the IAEA, the approval of the procedure for the joint use of the Portable Mini-multichannel Analyzer for gamma measurements, the development of the common inspection procedures agreed upon for the Angra I and II Nuclear Power Plants, and the development of a software for the joint auditing of records, which is currently being tested by both Agencies.

This period was also one of changes regarding our Agency's professional staff. In September, Dr. Carlos A. Feu Alvim da Silva, who had been alternatively in charge of ABACC's Secretariat since 1992, left his position as the most senior Brazilian officer in the Agency. This position was filled by Dr. José Mauro Esteves dos Santos as of December 2002. Previously, in April, Eng. Alfredo Biaggio, Planning and Evaluation Officer from Argentina, who was also a member of ABACC's initial team, returned to his country and was substituted in his position by Eng. Hugo Vicens. I want to emphasize the relevant job performed by Dr. Feu and Eng. Biaggio, who participated in ABACC's activities since its very beginning and who made a significant contribution towards the recognition of this Agency by the international safeguards community.

Elías Palacios
Secretary of the ABACC
between Dec. 12, 2001 and Dec. 11, 2002

2. Activities of the Commission

The Commission of the ABACC met in March and approved the annual report and the economic and financial balance sheet corresponding to 2001. In its second meeting, held in June, the ABACC's ruling Board analyzed the economic and financial balance sheet referred to the first four months in 2002 and discussed the Institution's financial situation, its Work Plan and the corresponding Budget for the year 2003. The Commission decided to set up a Work Team that would be devoted to perform a detailed analysis of the budget, aiming at its optimization and reduction, considering the changes in the economic scenario that had taken place in both countries, while evaluating their implications concerning the activities included in the Work Plan. The team met in October and performed a detailed analysis that resulted in savings amounting to US$ 255,000.00 in the budget proposed by the Secretariat. In its last meeting, held in December, the Commission approved the report issued by the aforementioned team, as well as ABACC's Budget for the year 2003, which amounted to US$ 2,640,000.00.

In addition to the above considerations, the Commission provided orientation concerning the performance of ABACC's Secretariat concerning other technical and political issues and approved a reformulation of ABACC's Listing of Inspectors, looking forward to the replacement of those who are not currently active. An updated Listing of Inspectors can be found in Chapter 3.3. Administrative and Financial Activities.

In June, Dr. Carlos Augusto Feu Alvim da Silva informed the Commission of his desire to be replaced in his position as the most senior Brazilian officer in ABACC's Secretariat and, thus, discontinuing his relationship with this Agency. This decision, made on the basis of strictly personal reasons, was made effective in September. Dr. Feu had been in charge of ABACC's Secretariat, alternating in the Secretary and Deputy Secretary positions on an annual basis, since 1992. In December, the transmission of the position as ABACC's Secretary was officially transmitted to Dr. José Mauro Esteves dos Santos, recently appointed as the most senior Brazilian officer in ABACC's Secretariat, while Eng. Elias Palacios started to perform as the Agency's Deputy Secretary.

The Commission has expressed its regret for Dr. Feu's resignation, along with its appreciation for his performance during the first ten years of ABACC, and highlighted his active participation in obtaining local and international recognition for this Agency.

Tribute to Dr. Carlos Augusto Feu Alvim da Silva and delivery of a commemorative plate in appreciation for his activities at the ABACC.

3. Activities of the Secretariat

3.1 Institutional Activities

During the first week of August, the Secretary General of the Agency for the Prohibition of Nuclear Weapons in Latin America and the Caribbean (OPANAL), Ambassador Edmundo Vargas-Carreño, visited the ABACC's headquarters. On this occasion, OPANAL's Secretary General expressed his interest in prompting cooperation between both institutions, as it had been foreseen in the cooperation agreement signed by ABACC and OPANAL in May 1993.

Upon request by both countries, ABACC issued semester statements for the Governments of Brazil and Argentina, thus complying with the requirements of the Tlatelolco Treaty, declaring that, on the basis of its verification activities and in compliance with the basic commitments established in the Agreement among the Federative Republic of Brazil, the Republic of Argentina, the International Atomic Energy Agency (IAEA) and ABACC for the Application of Safeguards (Quadripartite Agreement - INFCIRC/435), no events were detected in 2002 which could indicate a deviation of significant amounts of nuclear materials to any of the activities banned by the Tlatelolco Treaty in the territories of both countries.

Eng. Elias Palacios, Secretary of ABACC, greets the Secretary General of OPANAL, Ambassador Edmundo Vargas-Carreño, during his visit to the ABACC's headquarters.

As usual, ABACC attended, as an observer, the 46th General Conference of the International Atomic Energy Agency, which was held in Vienna, Austria, on September 16-20, 2002. During the Conference, in his presentation, ABACC's Secretary stated that the IAEA and ABACC intend to agree on the first "Guidelines for Joint Inspection Activities at specific facilities" during the course of this year. The completion of these "Guidelines" will allow to optimize the inspection efforts made by both organizations and, consequently, to reach an enhancement in the efficiency of safeguards without any loss in their effectiveness.

Events in which ABACC was represented during 2002:

a) 24th Annual Meeting of ESARDA (May 28-30, 2002, Kirchberg, Luxembourg).

Papers presented:

- ABACC's Effort Towards the Improvement of Joint Activities with the IAEA – authors: E. Palacios, M. Marzo and H. Vicens.
- Implementation of the Guidelines for Coordination of Routine and Ad-Hoc Inspection Activities between the Agency and ABACC – authors: O. Mafra, E. Palacios, C. Feu Alvim, O. Peixoto and J-Y. Lefebvre.

b) Annual Seminar of the Latin American Section of the American Nuclear Society -LAS/ANS- (June 17-20, 2002, Rio de Janeiro, Brazil).

c) 43rd Annual Meeting of the Institute of Nuclear Materials Management –INMM– (June 23-27, 2002, Orlando, FL, USA):

Papers presented:

- Unattended System versus Unannounced Inspections; Considerations Regarding Cost-Effectiveness- authors: M. Marzo, H. Vicens and A. Biaggio.
- ABACC Technical Support from Member States- authors: O. Mafra, L. Palhares, L. Rovere and C. Feu Alvim.
- Development of Low-Level Environmental Sampling Capabilities at Brazilian and Argentine Laboratories by ABACC – authors: O. Mafra, K. Olsen, D. Hembree, J. Carter, S. Hayes and M. Whitaker.
- Development of a Computer-Based Measurement System to Enhance Safeguards Applications at a Gas Centrifuge Enrichment Plant – authors: B. McGinnis, R. Mayer II, H. Rollen and O. Mafra.

d) International Nuclear Atlantic Conference -INAC- 2002 (August 11-16, 2002, Rio de Janeiro, Brazil).

ABACC participated as an exhibitor in the EXPONUC exhibition.

e) 46th General Conference of the International Atomic Energy Agency (September 16-20, 2002, Vienna, Austria).

3.2 Technical Activities

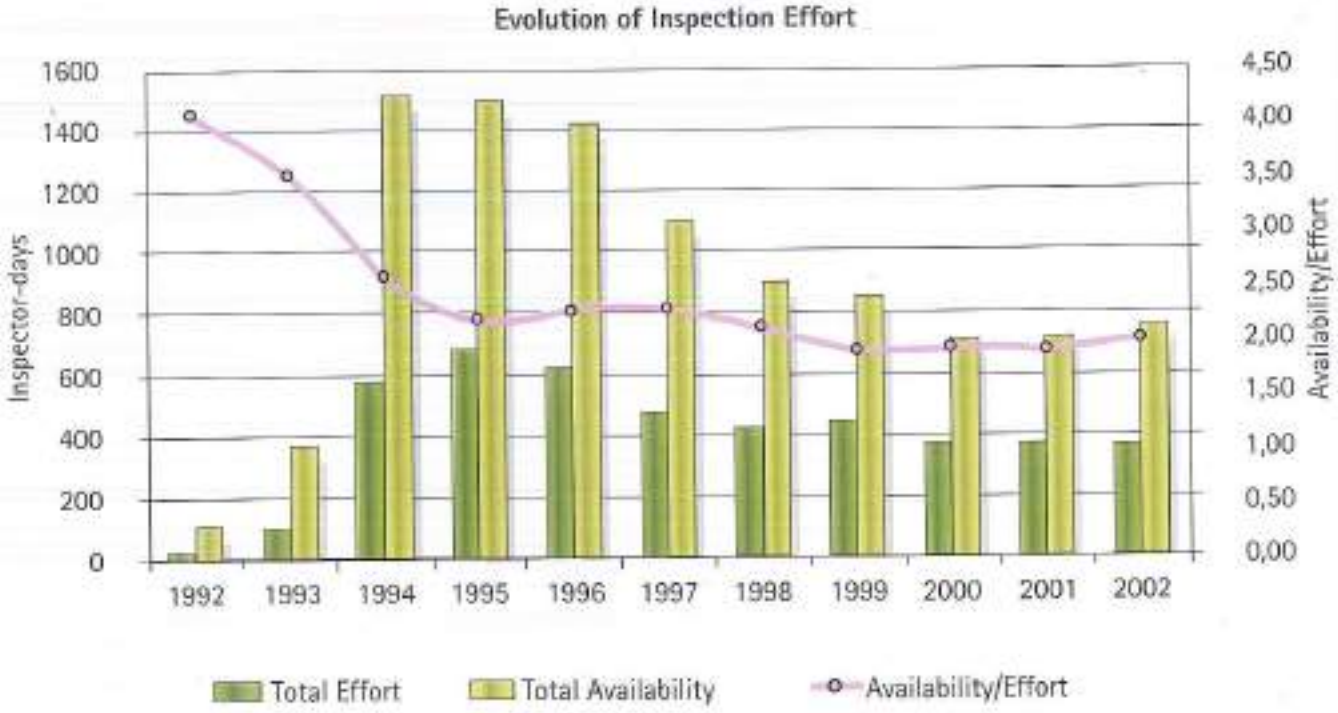
Among the technical activities performed during 2002, the following are especially worth mentioning:

- The application of the safeguards approach to USIDE's Uranium Enrichment Pilot Plant.
- The implementation, as a routine, of the Operations Database System.
- The conceptual definition of the fuel counter for Atucha I: detailed description of the project, cost assessment and startup of its implementation.
- Progress attained in the development of procedures for the joint use of equipment by ABACC and the IAEA, particularly with regard to the use of mini-multichannel analyzer and to a common procedure for auditing records.
- The preparation of standardized procedures with regard to the training of inspectors and the use of equipment.
- The editing of guidelines for joint inspection activities by ABACC and the IAEA in nuclear power plants, in enrichment facilities and in plants for conversion and manufacturing fuels aimed at nuclear stations.
- The development of software for analyzing the results of swipe sampling.

Operations

ABACC continued to perform routine and ad hoc inspections at diverse facilities in both countries, which were coordinated with the International Atomic Energy Agency (IAEA). Between January and December 2002, 56 inspections were performed in Argentine facilities and 49 inspections took place in Brazilian facilities. These activities required an inspection effort equivalent to 373 inspector-days in the field and the availability of 752 inspector-days, as detailed in the table below.

Type of inspection	Argentina	Brazil	Total
Physical Inventory Verification (PIV)	26	21	47
Interim Inspections	28	24	52
Unannounced Inspections	0	4	4
DIQ Verification (DIV)	2	0	2
Total inspections	**56**	**49**	**105**
Inspection effort (in inspector-day)	**253**	**120**	**373**
Availability (in inspector-day)	**471**	**281**	**752**



Further negotiations were held with the IAEA concerning the optimization of inspection efforts at facilities in both countries. Two work lines are being developed concerning this issue. A first one, developed by the ABACC, the IAEA and the National Authorities, is aimed at optimizing both the efficiency and the effectiveness of the inspections, considering frequencies, the number of inspectors and the nuclear materials involved, as well as the types of facilities, on the basis of ABACC's and the IAEA's safeguards criteria. Considerable progress was attained in this field. The second work line is based on the introduction of the Joint Inspection concept, the objective being the performance of all the safeguards activities only once during inspections and let the results be used by both organizations.

The first unannounced inspection was performed in August, jointly with the IAEA, at USIDE's Uranium Enrichment Pilot Plant and the results were satisfactory.

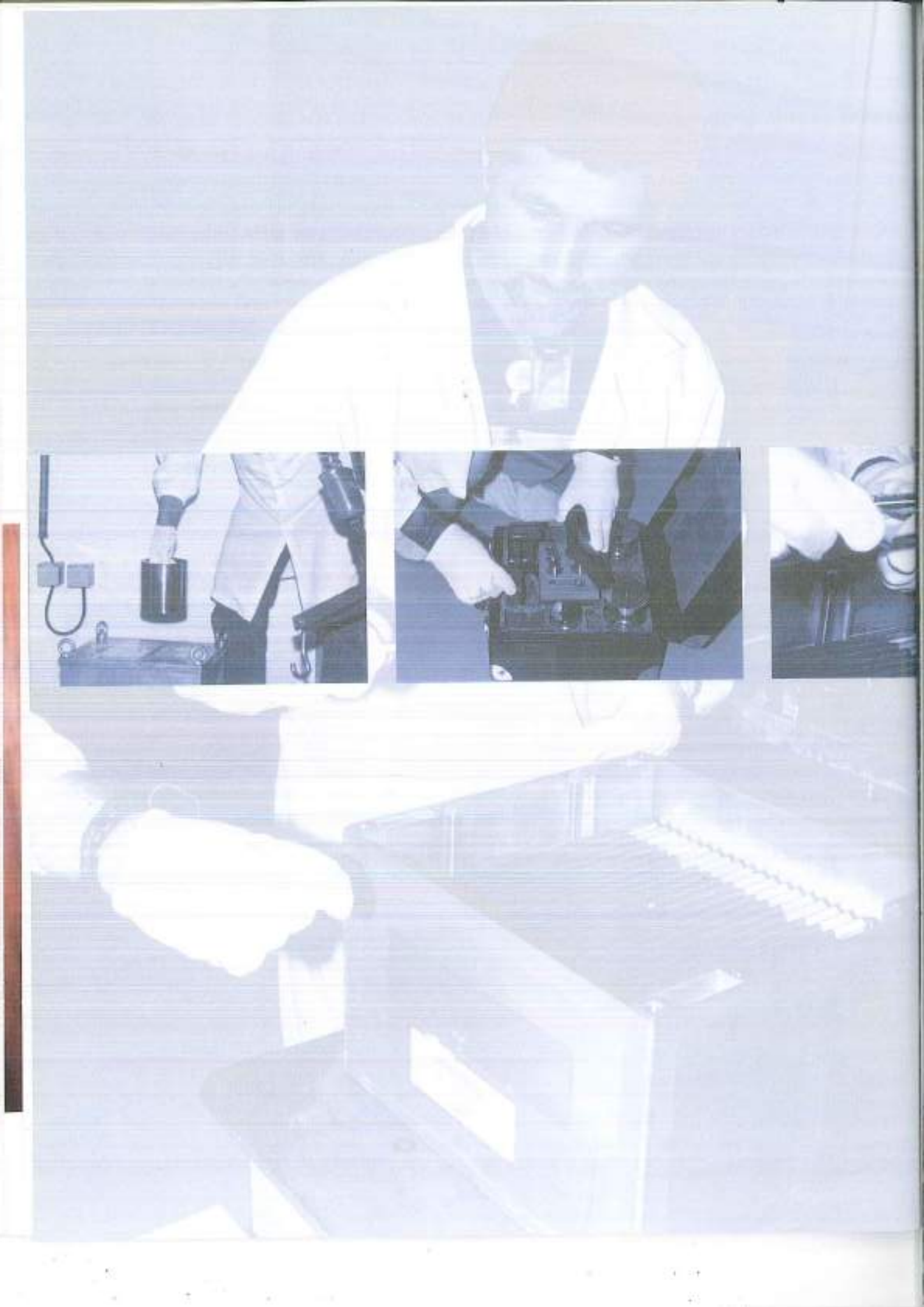
The inspections performed during this year in Argentina included two campaigns for the transfer of irradiated fuel elements to the dry-storage silos at the Embalse Nuclear Power Plant. The second campaign, performed between September and December, involved a slight increase in ABACC's inspection efforts.

The tests for verification of partial defects in Atucha-type fresh fuel elements, using the Neutron Coincidence Collar —which was especially adapted for this type of fuels—, were completed successfully. This unit was used for the first time during the annual physical inventory verification carried out in December 2002. The procedures for the joint use of this equipment are currently under negotiation by the IAEA and ABACC. Another joint activity involved maintenance services at Angra II's surveillance system, which belong to ABACC.

Concerning the rest of the procedures for common use of equipment with the IAEA, one to be especially highlighted is the implementation of the "Procedure for Common Use of the Portable Mini-multichannel Analyzer for Gamma Measurements", occurred during this year, taking into account the frequency of its application in inspections.

ABACC continued with the development of a new computer system and database for the monitoring and registration of inspection activities, which will be implemented by the Area of Operations. The system allows for connections between the latter and the various areas and sectors within ABACC requiring information with regard to inspections. The information managed by the system is of a technical and administrative nature, thus integrating some administrative sectors to the technical area. The new Operations Database System is in its final implementation stage. Almost 90% of the modules are already implemented and in use by ABACC, especially those related to stages involving the coordination and execution of inspections. The system did also involve other functions: its usage in notebooks and the possibility of editing the inspection reports in the field, thus reducing the need for availability of inspectors; automation in the remittance of inspection results to the national authorities and the IAEA; and pre-defined consultation of inspection data for management control purposes.

In cooperation with the Planning and Evaluation area, routine activities continued in the assessment of inspections and in the reporting of results to the corresponding National Authorities. The reports that need to be sent to the IAEA in connection with the facilities that already have a facility attachment in force were also issued.



Planning and Evaluation

The Planning and Evaluation area continued with the evaluation of the inspections carried out in Argentina and Brazil. The results of the nuclear material verification activities performed by the Secretariat in 2002 did not show any non-compliance by these countries with their basic commitments expressly agreed upon in the Bilateral and Quadripartite Agreements. The new computerized inspection system, described under Operations above, contributed very significantly to the timely performance of inspection evaluations this year.

IAEA, Brazil and the ABACC. For this purpose and during the April meeting of the Enrichment Team, a visit was made to the facilities and a work team was created for discussing preliminary issues related to the DIQ and fixing the boundary conditions for the development of a safeguards approach; this group met at the ABACC's headquarters in May. Finally, in October, the proposal of a safeguards approach introduced by the IAEA was discussed with the National Authority and the Operator, in order to do with a document that would serve as a basis for the next negotiation meeting, which is expected to be held in March 2003. Along with this, the ABACC

With regard to activities at the enrichment facilities, the documents "Safeguards Approach for the BRF" and "Arrangements between the ABACC and the IAEA for Unannounced Inspections and Swipe Samples at the BRF" were approved in April. Both documents started to be applied in June.

On the other hand, the reception of the first version of the Design Information Questionnaire (DIQ) of the commercial uranium enrichment plant being installed by *Indústrias Nucleares do Brasil (INB)* in its industrial premises of the Resende municipal district, State of Rio de Janeiro, was the starting point for the development of a safeguards approach contemplating the operation of the first module at this facility, within the framework of the Enrichment Negotiation Team constituted by the

has been preparing a transitory procedure that, if approved by the parties involved, could be applied during the commissioning of the facility, which is scheduled to occur during the first semester in 2003.

The ABACC and the ARN developed a project involving a fuel bundle counter system for the Atucha I Nuclear Power Plant, as previously agreed upon by the Quadripartite Agreement's Liaison Sub-Committee (LCS), which is essential for providing a definite solution to that facility's approach, allowing for a full verification of its inventory following both the ABACC's and the IAEA's safeguards criteria.

In order to speed up the implementation of actions allowing to apply a complete approach that is consistent with the current safeguards criteria for Atucha I, the IAEA

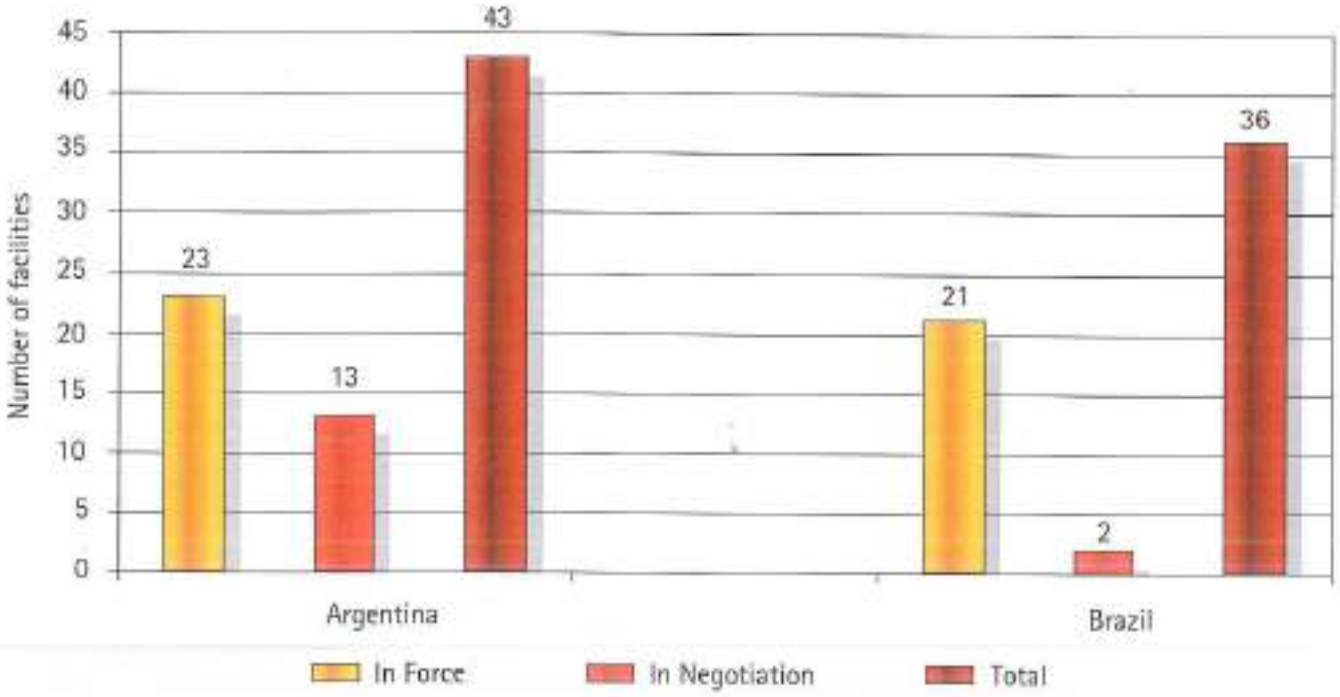
offered to install an equipment unit that is already available, with a design similar to the one agreed upon by the Subcommittee, and this was unofficially approved by the Parties. Its installation and testing are scheduled to take place during 2003.

On the other hand, during the meeting of the Liaison Subcommittee held in May, the IAEA reported that, on the basis of its safeguards criteria, Argentina would be unable to fulfill the safeguards goals as a country, due to the fact that the Secretariat of the IAEA considered that the inventory of fuel elements stored in the pools of the Atucha I Nuclear Power Plant had not been fully verified. Although, on the basis of the Agency's criteria, this does not involve non-compliance with the country's safeguards goals, the ABACC has been constantly in touch and participated in a meeting with representatives of the Argentine Nuclear Regulatory Authority (ARN), held in Buenos Aires in August, in order to cooperate in finding a satisfactory solution to this issue. Finally, the question was solved temporarily by actions undertaken during the facility's physical inventory verification in November 2002.

Two coordination meetings were held between ABACC and the IAEA during this year. During the same, topics of common interest were reviewed and information was exchanged regarding programs for the purchase of equipment, inspector training, procedures for the joint use of safeguards equipment and joint inspections, inspections timetable and situation concerning Design Information Questionnaires (DIQs) and Facility Attachments. During the first of these meetings, which was held in June at the IAEA's headquarters in Vienna, the new Director of the IAEA's B Operations Division, Mr. Olli Heinonen, was introduced to the ABACC's delegation. During the second meeting, held at ABACC's headquarters in Rio de Janeiro, it was time for the new Head of the OBP3 Section, Mr. Álvaro Gil Ramos, to be introduced to the ABACC's officers.

ABACC-IAEA Coordination Meeting at ABACC's Headquarters.

Status of the Facility Attachments



In May, a negotiation round dealing with Facility Attachments took place in Argentina. On this occasion, the IAEA presented a new proposal for solving the Nuclear Loss Registration issue, one that is still pending in the documents of the Atucha I and Embalse nuclear power plants. By year-end 2002, 23 Facility Attachments were in force for Argentine facilities. No negotiations took place this year with regard to Brazilian facilities; 21 Facility Attachments are in force for Brazil.

The ABACC and the IAEA undertook the development of joint procedures for the inspection of the most relevant facilities in Brazil and Argentina. These procedures are aimed at allowing the inspectors from both agencies to solve situations satisfactorily in the field, exchange data, avoid the duplication of activities and attain greater efficiency in the execution of safeguards inspections. As soon as these procedures comply with the IAEA's reference standards, the formats of the working papers for the various facilities need to be made uniform. It must be noted that complete versions of the procedures for joint inspection are already available and can be used as references by the inspectors at two Brazilian facilities, while procedures for joint inspection at two Argentine facilities are at an advanced stage of completion.

Technical Support

During this year, routine activities were carried out in connection with equipment and sample analysis. The analysis of the environmental samples (particle analysis) were outsourced to external laboratories, while the nuclear material samples were cross analyzed by ABACC's laboratory network with satisfactory results. The activities related to equipment involved analyzing –along with other sectors of ABACC's Secretariat– the priorities for the purchase of equipment units that will be used in the inspections, including the ones to be used jointly with the IAEA, managing and coordinating the corresponding procurement procedures, and preparing the units for the inspection work. The preparation for inspections includes the calibration of the units, the provision of instructions for use to the inspectors and, when applicable, the updating of the softwares employed.

Updates were carried out in the configuration of the surveillance systems at the Atucha I and Angra II NPPs in Argentina and Brazil, respectively, so as to optimize their reliability and reflecting the modifications in their systems implemented by the IAEA. The equipment units of the SDIS surveillance system installed in Angra II were also updated and the surveillance system (CPU/SDIS) installed in that facility was replaced. Another SDIS system was configured at ABACC and installed at Atucha I, thus replacing the old MIVs owned by the IAEA. During the period under analysis, some failures were detected in the surveillance equipment units. Along with the IAEA, the ABACC has applied the necessary action to ensure their appropriate maintenance.

The Argentine Nuclear Regulatory Authority (ARN) and ABACC have jointly defined the basic features of the unattended system that will be used for counting the spent fuel elements moved to the pool in the Atucha I Nuclear Power Plant. The IAEA has offered to take care of the installation of the system, considering that an equipment of similar characteristics is available in the Agency's inventory. In order to get acquainted with the details related to the installation of this equipment, ABACC participated —along with the IAEA and the ARN— in a technical visit to the Plant, during which an action plan was established for its installation in 2003.

New detectors, owned by the IAEA, were installed in the Argentine Embalse Nuclear Power Plant, replacing the TLDs and using the same VIFM electronic system used for the bundle counter. The procedure for the joint use of this system is currently under discussion by ABACC and the IAEA.

ABACC's irradiation profiling system at the dry storage silos of the Embalse Nuclear Power Plant was updated for its use with mini-multichannel analyzer. The detector was replaced and, also, the lead shielding was replace by a tungsten shielding. The performance of the system, in terms of the obtainment of profiles and spectra, has been satisfactory. Some mechanical modifications were made in the positioning system and the system was tested again at the silos in Embalse. On the other hand, the tests with the Vacoss seals were completed satisfactorily; this will allow for a full implementation of the verification of transfers of spent fuel elements to the dry storage canisters by an inspector from each one of the Agencies.

A series of activities were performed at the Isotopic Enrichment Laboratory (LEI) and the Uranium Enrichment Plant - USIDE, in order to optimize and improve the equipment and instruments used at these facilities. Among these activities, the following are to be noted: the purchase of an Am-Be neutron source that is now in use at the USIDE's plant, the construction of spacers that are being used by the ABACC and the IAEA for the calibration of the Go/No-go system in unannounced inspections, the update of the equipment for non-destructive analyses (NDA) —including the substitution of multi-channel analyzers, germanium and sodium iodide detectors, computers, and lifts for neutron detectors—, the verification of the calibration of the SLAB systems, an update of the configuration of the EMOSS surveillance systems and the implementation of the necessary software modifications in the Go/No-go equipment unit supplied by the IAEA, which will be tested again after the approval of the software by the operator.

A first version of the standard procedure for the calibration and maintenance of instruments was edited and discussed with representatives of the Brazilian Institute of Nuclear Quality (IBQN).

The installation of a system allowing to measure fresh fuel elements at different heights, using the neutron collar equipment, was completed at the Factory of Fuel Elements (FEC) run by *Indústrias Nucleares do Brasil (INB)*. This system is already being used as a routine during inspections.

An analysis was made of the results of the initial measurements made in Argentina, at CONUAR's factory of fuel elements, using the smaller-diameter neutron collar built by the IAEA for its use in Atucha-I-type fuel elements. As a result of these measurements, the conclusion was reached that the data available concerning the measurement of the fuel elements inside the packaging tubes (so as to avoid tentative damage) was not sufficient. After the performance of new measurements in actual fuel elements, both ABACC and the IAEA concluded that it is possible to measure the enrichment of the Atucha I fuel elements even within the protective layer. Since only a small number of measurements was made for testing reproducibility, the system is now being used jointly with the IAEA and the results are being verified within an acceptable uncertainty level.

ABACC's inspectors preparing the neutro collar for the measurement of a PWR fuel element at the Factory of Fuel Elements - FEC.

Accounting of Nuclear Materials

Until 2001, ABACC did with two main softwares: a) processing and evaluation of accounting reports —its use being restricted to the Accounting sector, both for data entry and for consultation; b) processing and evaluation of auditing data, accessible to both the Accounting and Operations sectors. During the first half in 2002, ABACC completed the unification of these two software programs and continued with their enhancement. The unified software includes functions for cross-checking of data obtained from reports and from auditing records in the facility, which allow for the verification of consistency between them, as well as a follow up of pending matters in a fast and efficient mode. New consultation functions have also been introduced and the unified software was installed on the computers of all ABACC's technical officers.

The procedure for the auditing of records used by ABACC includes the use of another software named SARA (Software for Auditing Records of ABACC), which has been in use by the ABACC since the year 2000 and has provided good results. SARA allows to perform audits of records in the field; the inspection data are entered from a diskette and the results are also generated in a diskette.

Meanwhile, aiming at the implementation of a joint auditing system with the IAEA, ABACC has made some modifications in its procedure for auditing records and has also modified its SARA program, thus allowing generating information in the format required by the IAEA. Since March 2002, the ABACC has been using this software (SJAR – Software for Joint Auditing Reports) in the field, with positive results. In November, the ABACC and the IAEA held a meeting in Vienna to evaluate this SJAR testing period and establish which will be the future stages for its implementation as a routine. ABACC presented the English version of the program and some

of the IAEA inspectors made some training exercises on its use. In December, a field-testing period was started along with the International Atomic Energy Agency (IAEA). During 2002, 25 ABACC inspectors were trained in the use of the SJAR by means of courses held in Rio de Janeiro and Buenos Aires.

The ABACC's Accounting sector and the Information Technology Division of the IAEA (SGIT) started testing in March and, in August 2002, they implemented a routine procedure for the exchange of correspondence via encrypted e-mail messages between both Agencies. The IAEA started this activity only with the transmission of the Summary of the Accounting Reports and, progressively, will be including the rest of the documents. Profiting of the above-mentioned visit to Vienna, the ABACC's Accounting officers started dealings aimed at the implementation of a procedure for the exchange of correspondence via encrypted e-mail messages between the ABACC and the IAEA's Operations sector, following the system that is already in use as a routine by the Information Technology Division (SGIT).

The update of ABACC's accounting records database involved the processing of 2,836 inventory variation lines and 4,917 lines related to the nuclear material inventory, corresponding to 568 accounting reports received from Argentina and Brazil. The data collected during the 104 audits performed in 2002 were used to update the record auditing database, involving the processing of 254 lines of inventory data, 796 updating lines and 42 lines for the correction of accounting data.

Technical Cooperation

The eighth meeting of the Permanent Coordination Group under the Technical Cooperation Agreement between ABACC and the United States Department of Energy (DOE) was held on May 8 at ABACC's headquarters. The projects underway were discussed and proposals were made for new projects related to the application of safeguards and to the need for purchasing equipment.

Among the technical cooperation activities between ABACC and the DOE, two Argentine laboratories (ARN, in Ezeiza, and Dioxitek, in Córdoba) and four Brazilian laboratories (one at the Institute of Radiological Protection and Dosimetry —IRD—, two at the Institute of Energy and Nuclear Research —IPEN—, and one at the Navy's Technological Center in *São Paulo* —CTM-SP) participated in an exercise for the measurement of standard environmental samples containing uranium, provided by the IAEA, with results equivalent to those of the DOE laboratories. Between May 22 and 30, a group of DOE

specialists visited these laboratories and presented a seminar on the performance of ICP mass spectrometry, while the laboratories that had already completed their analyses presented and discussed their results. These data were included in a paper entitled Development of Low-Level Environmental Sampling Capabilities at Brazilian and Argentinean Laboratories by ABACC, which was presented in the 43rd Annual Meeting of the Institute of Nuclear Materials Management (INMM) and is available for reading at ABACC's Internet website http://www.abacc.org.

In the field of destructive analyses, ABACC received from the New Brunswick Laboratory (NBL) the results of the analysis and characterization of the UO_2 pellets produced in Brazil and Argentina for their use as secondary standards in destructive analyses of nuclear materials. The procedures for the third Round Robin inter-comparison of results were discussed between ABACC and the NBL. The results, concerning both uranium content and isotopic ratio, are already being sent by the laboratories and shall be discussed during a meeting to be held during the first quarter in 2003 by ABACC, the NBL and the participating laboratories (see (*) in the table). This activity is also part of the technical cooperation between ABACC and the DOE.

Once more, ABACC's network of laboratories participated in inter-comparison exercises of results from destructive analyses promoted by the *Commissariat à l'Énergie Atomique* (CEA). For this purpose, the *Commission d'Etablissement des Methodes d'Analyse* (CETAMA) launched an inter-comparison program for the measurement of uranium called EQRAIN Nr. 10 (*Evaluation de la Qualité du Résultat d'Analyse dans l'Industrie Nucléaire*). ABACC has invited 12 Brazilian and Argentine laboratories to participate in this inter-comparison program (see (**) in the table) and 10 of them have accepted to participate.

Brazilian Laboratories

- *Centro de Desenvolvimento da Tecnologia Nuclear - CDTN /CNEN*
  Supervisão de Química e Mineralogia (*)(**)
- *Instituto de Pesquisas Energéticas e Nucleares – IPEN/CNEN-SP*
  Divisão de Diagnóstico Ambiental – (MQA, CQMA e CQMA -LA) (*)
- *Instituto de Engenharia Nuclear – IEN/CNEN*
  Supervisão de Apoio Químico e Metalúrgico – SUAPQ (*) (**)
- *Centro Tecnológico da Marinha em São Paulo – CTM-SP*
  Laboratório de ICPMS (LICPMS) (*)
- *Centro Tecnológico da Marinha em São Paulo – CTM-SP*
  Laboratório de Caracterização de Urânio (**)
- *Instituto de Radioproteção e Dosimetria – IRD/CNEN*
  Laboratório de Salvaguardas-LASAL (**)
- *Instituto de Pesquisas Energéticas e Nucleares –IPEN/CNEN-SP*
  Laboratório de Caracterização Química (**)

Argentine Laboratories

- *Comisión Nacional de Energía Atómica (CNEA)*
  Grupo de Servicios Analíticos
  Unidad de Actividad Química – UAQ (*)
- *Comisión Nacional de Energía Atómica (CNEA)*
  Centro Atómico Constituyentes – CAC
  Laboratorio de Control Químico y Físico - U.A.
  Combustibles Nucleares (*)
- *Comisión Nacional de Energía Atómica (CNEA)*
  Centro Atómico Constituyentes – CAC
  Laboratorio P.F.P.U –U.A. Combustibles Nucleares (*)
- *Comisión Nacional de Energía Atómica (CNEA)*
  Centro Atómico Ezeiza
  Laboratorio Química Analítica (*) (**)
- *CONUAR S.A.*
  Laboratorio Químico Analítico (**)
- *Complejo Fabril de Córdoba – DIOXITEK S.A.*
  Control de Calidad y Ensayos (**)
- *INVAP S.A.*
  Laboratorio Química Analítica (**)

The second annual meeting of ESARDA's NDA Work Team, attended by a representative of ABACC as an observer, was held on November 29-30 in Brussels, Belgium. Issues of interest for ABACC were discussed, in which our Agency has participated either directly or through the countries, such as the completion of the ESARDA NDA Performance Values, the exercises for the calculation of neutron response by the Monte Carlo method (MNCP) and the Guidelines for Unattended and Remote Monitoring Systems, which are common to C&S and NDA, among other.

Personnel Training

In 2002, 25 inspectors from ABACC were trained in the use of the new modified software for the auditing of records that shall be used jointly by ABACC and the IAEA in their inspections, as mentioned above under Accounting of Nuclear Materials.

The project for a standardization procedure concerning the training of inspectors was elaborated and discussed with the Brazilian Institute of Nuclear Quality (IBQN). This was done following the model defined in a former document, approved in April, which describes the basic rules for the elaboration and issue of procedures and working instructions concerning the performance of the activities to be standardized.

In order to allow for the training of the inspectors in the use of the MCA-166 mini-multichannel analyzer at the working premises, ABACC is developing a CD-Rom containing the basic theory and the operating instructions of this equipment unit used in its safeguards inspections. Although it does not contain simulation, this new teaching method will provide the ABACC inspectors with access to the theory, thus allowing them to understand how the equipment works, and to practice, in order to learn

Inspectors from ABACC and the IAEA during a training course on unannounced inspections to uranium enrichment plants.

the operation on a step-by-step basis. The new teaching method is in its final review stages and shall be completed during 2003.

The IV Course for the Training of ABACC and IAEA inspectors in Unannounced Inspections was held in *São Paulo* (at the Institute of Energy and Nuclear Research —IPEN— and ARAMAR) on May 13-17, with the participation of instructors from CNEN, ARN, IAEA and ABACC. 6 ABACC inspectors and 5 IAEA inspectors were trained. The mock-up used in previous courses was assembled again in order to simulate the ultracentrifuge cascade. The course program included activities that are performed during unannounced inspections, such as containment verification and surveillance (C&S), non-destructive analyses (NDA), perimeter verification and environmental sampling.

3.3 Administrative and Financial Activities

The administrative and financial activities were carried out regularly, in accordance with ABACC's Regulations and Standards. The most relevant issues were: a) HLB Auditors performed an audit on accounting statements, in-house controls and application of standards, concerning the 2001 fiscal year, and the corresponding report was presented to the Commission during its first ordinary meeting of the year; b) the ABACC's 2001 Economic and Financial Balance Sheet was analyzed and approved by the Commission; c) the 2001 Annual Report was approved and forwarded to the Governments of Brazil and Argentina, in compliance with the provisions in Article XI, item i) of the Bilateral Agreement; and d) a Work Plan for the year 2003 and the corresponding Budget were prepared and also approved by the Commission.

The reform of the wiring in ABACC's computer and communications network was completed, thus providing further protection to the equipment and greater security in the use of ABACC's internal and external data.

ABACC Commission - 2002

Full Members

for the Federative Republic of Brazil

Ambassador Antonio José Vallim Guerreiro
Director General
Department of International Organizations
Ministry of Foreign Affairs

José Mauro Esteves dos Santos
Chairman
National Nuclear Energy Commission

(until November 5, 2002, when he was appointed Secretary of ABACC by the Brazilian Government)

for the Republic of Argentina

Ambassador Atilio Norberto Molteni
Director General for International Security,
Nuclear and Space Affairs
Ministry of Foreign Affairs,
International Trade & Religion

Diana Clein
Chairman
Nuclear Regulatory Authority

Acted as Alternate Members

Ana Maria Sampaio Fernandes
(alternate for Antonio Guerreiro)

Laércio Antonio Vinhas
(alternate for José Mauro Esteves dos Santos)

Sonia Fernández Moreno
(alternate for Diana Clein)

ABACC Secretariat - 2002

Elías Palacios
Secretary
12/12/2001 - 12/11/2002

Carlos Augusto Feu Alvim da Silva
Deputy Secretary
12/12/2001 - 9/06/2002

On November 5, 2002, **José Mauro Esteves dos Santos** was appointed by the Brazilian Government as the most senior Brazilian officer at the ABACC Secretariat. He took over the position as Secretary on December 12, 2002.

Technical Area

Alfredo Lucio Biaggio
Planning & Evaluation Officer (until April 2002)
In April, **Hugo Edgardo Vicens** took over the functions of Planning & Evaluation Officer

Marco Antonio Marzo
Planning & Evaluation Officer

Horacio Lee Gonzales
Operations Officer

Orpet José Marques Peixoto
Operations Officer

Rubén Nicolás
Nuclear Material Accounting Officer

Lilia Crissiuma Palhares
Nuclear Material Accounting Officer

Luis Alfredo Tomás Rovere
Technical Support Officer

Olga Y. Mafra Guidicini
Technical Support Officer

Administrative Area

Marcio Costa
Head - Administration & Finance
(through to November 28, 2002)

Ana Claudia Raffo Caiado
Responsible for Institutional Relations

Office staff: **Luiz da Costa Gonçalves**
Maria Isabel Reyes Gonzalez
Claudia Maria Alvim Siqueira (until march 2002)
Winarni
Maria Dilma Marcolan Cosetti
Paulo Cesar da Silva
Max Teixeira Facchinetti (*)

Representation in Argentina: **Osvaldo Alberto Cristallini (*)**
Leonor Onorati (*)

(*) Autonomous

List of ABACC Inspectors

Argentina

Consultant Inspectors

Alfredo Lucio Biaggio
Antonio Oliveira
Nazario Eduardo D'Amato
Osvaldo Alberto Cristallini
Sonia Fernández Moreno

Inspectors

Adrián Goldschmidt
Adrián Pérez
Analía Delia Saavedra
Beatriz Gregori
Carlos Eduardo Rodriguez
Carlos Daniel Llacer
Carlos Rojas
Dora Vidal
Eduardo Quintana
Elena Maceiras de Jefimowicz
Elena Moschella
Elias Palacios
Gustavo Alfredo Bustos
Horacio Martin Lee Gonzales
Hugo Edgardo Vicens
Hugo Rey
Jorge Fernández
Jorge Omar Remedi
Juan José Kunst
Juan Marcos Ferro
Julio Alberto Mascitti
Laura Beatriz Castro de Rossi
Leonardo Juan Sobehart
Liliana Inés De Lio
Lucía Isabel Valentino de Pereyra
Luis Alberto Giordano
Luis Alfredo Tomás Rovere
Marcelo Rojo
Mauricio Guillermo Bachoer
Miguel Righetti
Osvaldo Alberto Calzetta Larrieu
Pablo Adelfang
Pablo Carlos Florido
Pablo Cristini
Rubén Fernando Lavayén
Rubén Osvaldo Nicolás
Susana Beatriz Papadópulos
Susana Canavese
Sergio Menossi

Brazil

Consultant Inspectors

Bernardino Coelho Pontes
Fernando da Costa Magalhães
Francisco de Assis Brandão
Laércio Antonio Vinhas
Maria Clarisse Lobo Iskin
Silvio Gonçalves de Almeida

Inspectors

Bertha Floh de Araújo
Carlos Augusto Feu Alvim da Silva
Célia Christiani Paschoa Portoghese
Cláudio Luiz de Oliveira
Clèber Lopes de Oliveira
Cyro Teiti Enokihara
Dulce Maria Daher
Eduardo de Braga Melo
Fábio Cordeiro Dias
Florentino Menchero Palacio
Francisco José de Oliveira Ferreira
Geraldo Renha Júnior
Gevaldo Lisboa de Almeida
Ivan José Tomazelli
Ivan Santos
João Batista Borges
José Afonso de Barros Filho
José Augusto Perrotta
José Cláudio Pedrosa
José Gláucio Motta Garone
José Henrique Barbosa Bezerra
José Henrique Buchmann
José Osmário Vieira Lima
José Roberto Tavares de Paiva
José da Silva Guimarães
Leonardo Souza Dunley
Lília Crissiuma Palhares
Luiz Antônio de Mello
Marco Antonio Saraiva Marzo
Marcos Sodré Grund
Miriam Dias Pacheco
Olga Y. Mafra Guidicini
Orpet José Marques Peixoto
Pedro Dionísio de Barros
Roberto Stasiulevicius
Sérgio Barros Paixão
Vitório Emílio da Silveira Nunes
Walter Pereira

Acronyms and Abbreviations

ACDA: ..... Arms Control and Disarmament Agency
AN: ..... Autoridade Nacional
ARN: ..... Autoridad Regulatoria Nuclear
CAB: ..... Centro Atómico Bariloche
CAC: ..... Centro Atómico Constituyentes
CAE: ..... Centro Atómico Ezeiza
CDTN: ..... Centro de Desenvolvimento da Tecnologia Nuclear
CEA: ..... Commissariat à l'Énergie Atomique
CETAMA: ..... Comission d'Etablissement des Méthodes d'Analyse
CNE: ..... Central Nuclear Embalse
CNEA: ..... Comisión Nacional de Energia Atómica
CNEN: ..... Comissão Nacional de Energia Nuclear
CONUAR: ..... Combustibles Nucleares Argentinos S.A.
CTM-SP: ..... Centro Tecnológico da Marinha do Brasil em São Paulo
DIQ: ..... Design Information Questionnaire
DOE: ..... US Department of Energy
DAMRI: ..... Département des Applications et de la Métrologie des Rayonnements Ionisants
ESARDA: ..... European Safeguards Research and Development Association
EURATOM: ..... European Atomic Energy Community
FA: ..... Facility Attachment
FEC: ..... Fábrica de Elementos Combustíveis
IAEA: ..... International Atomic Energy Agency
IBQN: ..... Instituto Brasileiro de Qualidade Nuclear
ICPS: ..... Ion Coupled Plasma Mass Spectrometer
ICR: ..... Inventory Change Report
IEN: ..... Instituto de Engenharia Nuclear
INB: ..... Indústrias Nucleares do Brasil
INFCIRC: ..... Information Circular (AIEA) (INFCIRC/435: Circular issued regarding the Quadripartite Agreement)
INMM: ..... Institute of Nuclear Material Management
INVAP: ..... Investigación Aplicada S.E.
IPEN: ..... Instituto de Pesquisas Energéticas e Nucleares
IRD: ..... Instituto de Radioproteção e Dosimetria
IRMM: ..... Institute for Reference Materials and Measurements
JRC: ..... Joint Research Centre
LANL: ..... Los Alamos National Laboratory
LEI: ..... Laboratório de Enriquecimento Isotópico

LOF: ..... Location Outside Facility – any location where nuclear materials are used or stored in amounts equivalent or lower than one effective kilo

MBA: ..... Material Balance Area

MBR: ..... Material Balance Report

NBL: ..... New Brusnwick Laboratory

NDF: ..... Non-Proliferation and Disarmament Fund

NUSIMEP: ..... Nuclear Signatures Measurement Evaluation Program

OPANAL: ..... Organismo para la Proscripción de las Armas Nucleares en la América Latina y el Caribe

PCG: ..... Permanent Coordination Group – ABACC/DOE Cooperation Agreement

PIL: ..... Physical Inventory List

PNL: ..... Portsmouth National Laboratory

PNNL: ..... Pacific Northwest National Laboratory

REIMEP: ..... Regular European Interlaboratory Evaluation Program

SARA: ..... Software for Auditing Records of ABACC

SCCC: ..... Sistema Comum de Contabilidade e Controle de Materiais Nucleares

SESAL: ..... Serviço de Salvaguardas

SJAR: ..... Software for Joint Auditing Reports

SNL: ..... Sandia National Laboratory

TIMs: ..... Thermo Ionic Mass Spectrometer

TNP: ..... Treaty on the Non-Proliferation of Nuclear Weapons

USIDE: ..... Planta Piloto de Enriquecimento de Urânio

ABACC

Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials

Av. Rio Branco,123 grupo 515 - 20040-005 - Rio de Janeiro - RJ - Brazil

Phone: (+55-21) 2221-3464 • fax: (+55-21) 2607-1857

www.abacc.org • e-mail: postmaster@abacc.org

Text and Pictures

ABACC

Design and Production

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