ABACC

Agência Brasileiro-Argentina de Contabilidade e Controle de Materiais Nucleares

Agencia Brasileño-Argentina de Contabilidad y Control de Materiales Nucleares

Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials

RELATÓRIO ANUAL
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2019

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MESSAGE FROM THE SECRETARY

It is with great pleasure that I present the report of the activities of the Brazilian–Argentine Agency for Accounting and Control of Nuclear Materials (ABACC) for 2019.

ABACC's mission is to verify that Argentina and Brazil have complied with the commitments laid down in the Bilateral Agreement between the Republic of Argentina and the Federative Republic of Brazil for the Exclusively Peaceful Use of Nuclear Energy, and to that end, ABACC applies the Common System of Accounting and Control of Nuclear Materials (SCCC).

During 2019, 105 inspections were carried out at the nuclear installations of the two countries and 62 technical visits were made to verify the design information. This required an inspection effort of 949 inspector-days. The evaluation of the data obtained allows us to conclude that both countries have complied with the terms of the Bilateral Agreement.

Throughout its existence, ABACC's verification activities have been seen to be highly efficient and effective. This is due to its staff of qualified and systematically trained inspectors.

We have also taken special care to maintain and improve the quality of the technical equipment required for verifying and controlling nuclear material. Over the last few years, ABACC has invested in modern surveillance systems for nuclear installations. In 2019, we took an important step in this direction with the acquisition and installation of state-of-the-art cameras at the Atucha I Nuclear Power Plant.

As far as dealing with technical and administrative information is concerned, we have completed the installation and migration of the computer systems to modern platforms, enabling more efficient, secure data management.

We are aware of our responsibility to protect the information provided by the two countries; therefore, we highlight our strict, effective compliance with ABACC's internally established information security policy guidelines.

The continuous growth of nuclear activities in the two countries represents a constant challenge to ABACC. During 2019, in addition to carrying out design information verification activities for new facilities, adequate safeguards approaches have been developed.

The Quadripartite Safeguards Agreement, between the International Atomic Energy Agency (IAEA), ABACC, Argentina and Brazil, includes well defined provisions covering the cooperation and coordination of activities between the two agencies, in order to minimize duplication of efforts while, at the same time, reaching independent conclusions. In this context, the Secretariat would like to draw attention to the good relationship between ABACC and the IAEA in the planning and carrying out of inspections, the shared use of equipment, the joint audits of the accounting records and the development of safeguards approaches.

At the present time, ABACC is the only bilateral nuclear safeguards system in the world. Argentina and Brazil have constantly attributed great importance to this model and its dissemination through the international community.

In 2019, in the margins of the 63rd IAEA General Conference and to celebrate the 25th anniversary of the Quadripartite Safeguards Agreement, the Secretariat and the countries' Permanent Missions in Vienna, organized a side event about ABACC and its relationship with other organizations, especially with the IAEA. Furthermore, during 2019, we started receiving annual visits from participants of the United Nations Programme of Fellowships on Disarmament as a result of the study of ABACC having been incorporated into the scope of the program.

Finally, the Secretariat give thanks to the National Authorities of the two countries for their high level of cooperation, which is essential for ABACC to fulfill its mission, to the members of the ABACC Commission for their continuous support, and to the officers inspectors and assistants of our organization for the professionalism, dedication and enthusiasm with which they have carried out their work.

EXECUTIVE SUMMARY

The objective of the Brazilian–Argentine Agency for Accounting and Control of Nuclear Materials (ABACC) is the application of the Common System of Accounting and Control of Nuclear Materials (SCCC), established by the Agreement between the Republic of Argentina and the Federative Republic of Brazil for the Exclusively Peaceful Use of Nuclear Energy – Bilateral Agreement. The SCCC is a set of criteria, and verification and control procedures to ensure that nuclear materials are not diverted to the manufacture of nuclear weapons or other explosive nuclear devices.

In 2019, ABACC performed and evaluated 105 Inspections at nuclear installations in both countries and undertook 62 technical visits to verify the design information of nuclear installations

With its focus on increasing the efficiency and effectiveness of the application of the SCCC, ABACC has prioritized the updating of its measurement, and its containment and surveillance technology and related systems, as well as the introduction of new verification procedures, which reduce the inspection effort without losing effectiveness.

The training of ABACC's inspectors is essential for maintaining the high effectiveness level in applying the SCCC. Training courses were given in the areas of nuclear material records auditing, containment and surveillance systems, and inspection procedures for fuel fabrication plants. In addition to these courses, routine training focused on inspection procedures and equipment was carried out prior to each inspection.

The development of the New Joint Auditing System for Accounting Records (NSJAR), for carrying out joint audits with the International Atomic Energy Agency (IAEA) was completed. It will start to be used for inspections in 2020.

The ABACC-Cristallini method, for collecting UF6 samples using alumina pellets in conversion and enrichment facilities, has been certified by the American Society for Testing and Materials (ASTM). This means that this method is certified for use in this type of nuclear installations anywhere in the world.

Finally, it is worth highlighting the progress made towards the implementation of the ABACC information security policy, which lays down the organizational guidelines for the protection of information assets and for information classification with regards to confidentiality.

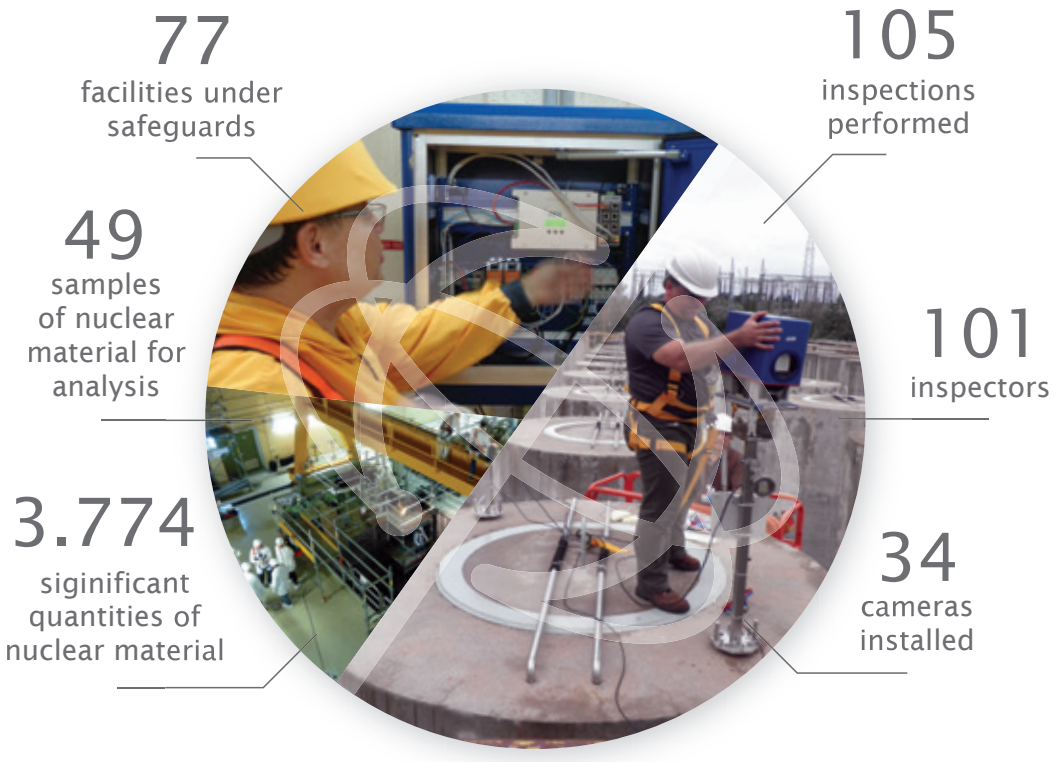
1. ABACC

1.1 History and Mission

ABACC was created on July 18, 1991, with the signing of the Agreement between the Republic of Argentina and the Federative Republic of Brazil for the Exclusively Peaceful Use of Nuclear Energy (Bilateral Agreement) which entered into force on December 12, 1991, after being approved by the National Congress of each country.

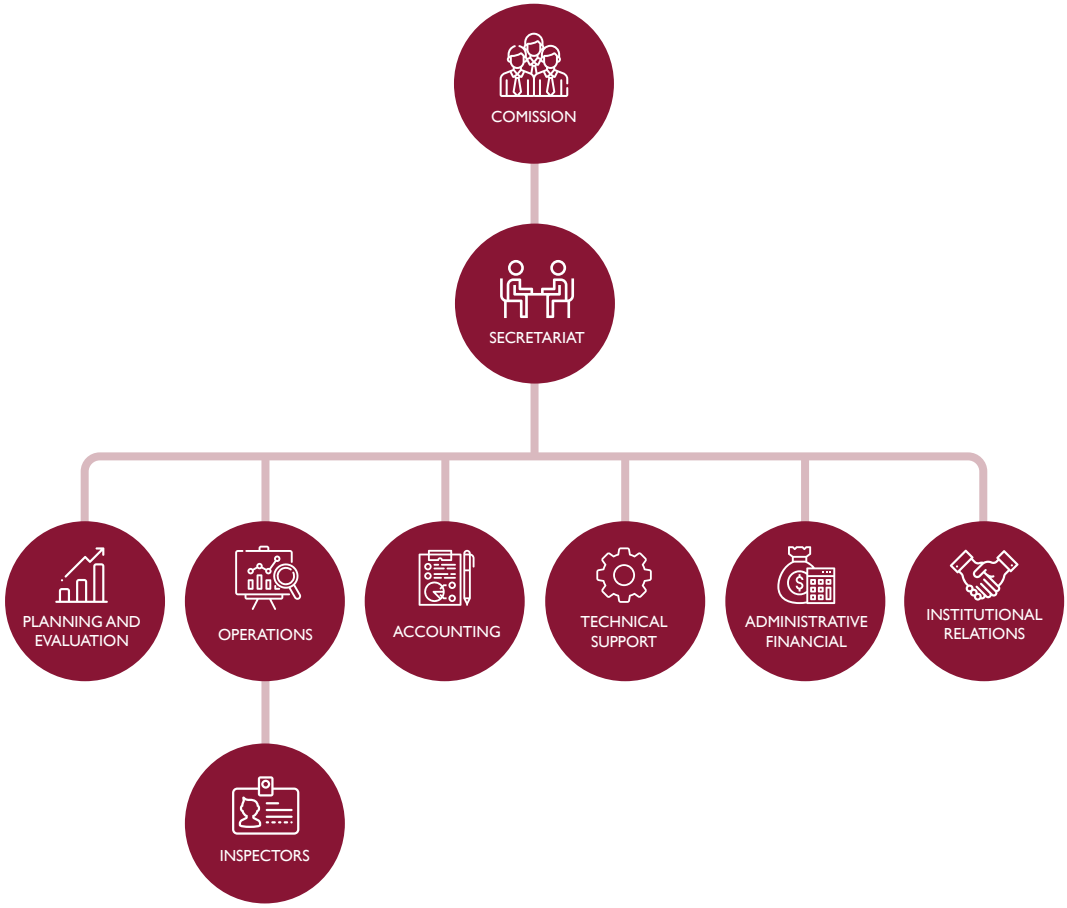
ABACC's mission is to verify that Argentina and Brazil have complied with the commitments laid down in the Bilateral Agreement.

In order to fulfill its mission, ABACC applies a bilateral safeguards system named the "Common System of Accounting and Control of Nuclear Materials (SCCC)", which establishes the verification criteria and procedures to be applied to all nuclear materials in all nuclear activities in Argentina and Brazil, thus guaranteeing the ability to timely detect possible diversions of these materials for the manufacture of nuclear weapons.



1.2 Organization Chart

ABACC's organizational chart is shown below.



The Commission, which is ABACC's policy making organ, is composed of four members, with two nominated by each country.

The Secretariat, which is ABACC's executive body, is composed of twelve members - six from Argentina and six from Brazil. The Secretary and Deputy Secretary, who alternate annually in the performance of their duties, are the highest-ranking officers in the hierarchy and are responsible ensuring that SCCC's control and verification activities are fulfilled efficiently and effectively.

Eight administrative and auxiliary staff support the routine activities that are necessary for the good functioning of the Secretariat.

In 2019, there were 52 Argentinean and 49 Brazilian ABACC inspectors, who had been appointed by the respective countries. Inspectors from Argentina carry out inspections at the Brazilian facilities and inspectors from Brazil at the Argentinean facilities. Inspectors are considered ABACC Secretariat staff during the safeguards missions for which they are called.

2. ABACC'S VERIFICATION ACTIVITIES

The chart below presents the installations subject to verification by ABACC.

TYPE OF FACILITY	ARGENTINA	BRAZIL	TOTAL
Conversion and Fuel Fabrication	9*	2	11
Uranium Enrichment	2	3	5
Power Reactors	5*	3*	8
Research Reactors / Critical and Sub Critical Units	7*	7*	14
Others (Research & Development Facilities, Storage Units, etc.)	29	10*	39
TOTAL	**52**	**25**	**77**

* one under construction

In 2019, ABACC performed 105 inspections in nuclear installations in both countries and 62 visits to verify the design information of nuclear facilities. 47 of these visits were carried out together with the inspections. The inspections effort required a total of 949 inspector-days, made up of in-field activities and pre- and post-inspection activities.

During the inspections, as well as carrying out 642 non-destructive measurements and 183 weighing, a total of 49 samples of nuclear material were collected in Argentina and Brazil to determine the element uranium and the U-235 isotope in the ABACC network laboratories. Furthermore, 39 environmental swipe samples were taken to be analyzed for uranium particles.

To control the nuclear material at the two countries' installations, a total of 901 seals have been applied and 34 surveillance cameras used.

The following charts show the verification effort and the number of inspections performed by type of facility. It is worth noting that uranium enrichment plants are the ones requiring the highest inspection effort in Brazil, while in Argentina most of the effort takes place in the power reactors and the conversion and fabrication plants.

VERIFICATION EFFORT BY TYPE OF FACILITY (INSPECTORS X DAYS)

NUMBER OF INSPECTIONS BY TYPE OF FACILITY

1. Includes Critical and Subcritical Assmblies
2. Includes Laboratories, Storages, R&D, Production of Radioisotopes, etc.

Ten technical missions were carried out for the installation and preventive or corrective maintenance of measurement equipment and containment and surveillance systems. All the surveillance equipment installed at the Atucha I and II Nuclear Plants was substituted by cutting edge Next Generation Surveillance System (NGSS) equipment, leading to increased reliability and better resolution, and reducing the risk of failures.

A remote verification system giving the working status (State of Health - SoH) of the surveillance systems installed at the Atucha II Nuclear Plant and the Angra 2 Nuclear Plant is in operation.

623 accounting reports received from Argentina and Brazil were processed, and 93 accounting audits were carried out in nuclear facilities. At the end of 2019, the total inventory of material in the two countries registered an increase of 2.6% over the previous year.

The modernization of the Central Nuclear Materials Accounting System (SCCMN) has continued. The constituent modules are at the development and testing stage.

ABACC has completed the development of its New Joint Auditing System for Accounting Records (NSJAR) for carrying out audits with the IAEA. This will start to be used in inspections in 2020.

3. COORDINATION OF ACTIVITIES WITH THE IAEA

According to the terms set out in the Agreement between the Republic of Argentina and the Federative Republic of Brazil, ABACC and the International Atomic Energy Agency (IAEA) for the Application of Safeguards – Quadripartite Agreement – ABACC coordinates its verification activities with those of the IAEA to the maximum in order to minimize the duplication of efforts. With this aim, ABACC and the IAEA share containment, surveillance, detection and measurement systems under the concept of "joint use" and develop joint approaches and inspection procedures for the installations submitted to SCCC, which contribute to optimizing the effectiveness of the respective safeguards. In 2019, ABACC and the IAEA held eleven bilateral technical meetings with the national authorities to discuss specific issues on the implementation of safeguards in facilities of both countries.

The 18th meeting of the Liaison Sub-Committee (on May 9th in Rio de Janeiro), the 33rd Coordination Meeting (on September 20tht in Vienna) and the 18th meeting of the Liaison Committee (on October 25th in Rio de Janeiro) were held, as laid down in the Quadripartite Agreement. These meetings take place annually, in order to assess the status of the implementation of safeguards and to improve the verification activities for nuclear materials and facilities.

4. COORDINATION OF ACTIVITIES WITH ARGENTINA AND BRAZIL

According to the terms set out in the Agreement between the Republic of Argentina and the Federative Republic of Brazil - the Bilateral Agreement – the two countries cooperate with ABACC for the satisfactory accomplishment of its mission.

In 2019, six technical meetings were held with the national authorities of Brazil and Argentina to discuss specific issues on the implementation of safeguards at installations of both countries, including coordination meetings within the framework of the Quadripartite Agreement.

It is also important to highlight the cooperation of both countries as per supply of design information and the necessary activities to the development of safeguards verification approaches and procedures, the technical cooperation for testing equipment and new technologies, as well as their technical support in the fields of destructive and non-destructive measurements.

5. TECHNICAL COOPERATION

Cooperation with institutions which work in the area of nuclear safeguards is relevant for the exchange of information on safeguards concepts and techniques and for the development of projects of interest to ABACC, in order to contribute to increasing the efficiency and effectiveness of its activities.

ABACC holds technical cooperation agreements with institutions in Argentina, Brazil, the European Community, the United States, South Korea and with the IAEA.

For 2019, the following activities are worth highlighting:

5.1 Technical Cooperation with the IAEA

ABACC Network Laboratories routinely participate in the IAEA's destructive analysis intercomparison exercises, called Nuclear Material Round Robins (NMRORO). ABACC coordinates the execution of the exercises and encourages specialists to take part.

In the context of the development of equipment and technologies for common use, ABACC and the IAEA have carried out tests of a new technology, based on a laser system, with potential use as a contention system in the dry storage of fuel elements at the Atucha I Nuclear Power Plant. These tests were performed in cooperation with the operators and the Argentinean National Authority.

As part of their cooperation with the IAEA, Argentina and Brazil have continued with the activities for the implementation of the "ABACC-Cristallini" Method for UF_6 sampling in conversion and enrichment facilities subject to the SCCC. The IAEA has proposed testing the method in commercial uranium enrichment facilities in several other countries.

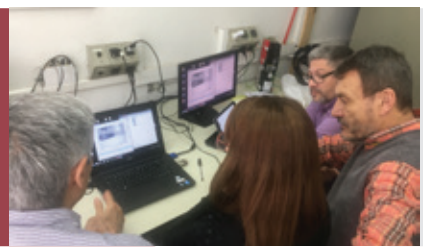
5.2 Technical Cooperation with the DoE

A new project to continue with the intercomparison program to ensure the quality of the results of ABACC Network laboratory analyses has been started. In this project, the laboratories analyze nuclear material samples sent by the New Brunswick Laboratory (NBL) of the United States. ABACC coordinates and monitors the results obtained.

The update of the non-destructive measurement system in use at the two uranium enrichment facilities in Brazil has been finalized as part of the scope of a cooperation project.

6. TRAINING

Training courses for inspectors enable ABACC to maintain a high level of effectiveness of its inspections. The chart below shows the training courses given in 2019.

ABACC-IAEA Joint Auditing System for Accounting Records (SJAR)		**Date:** 22 - 26/04 **Venue:** Buenos Aires Argentina **Participants:** 10
ABACC-IAEA Joint Auditing System for Accounting Records (SJAR)		**Date:** 10 - 14/06 **Venue:** Rio de Janeiro Brazil **Participants:** 10
Containment and Surveillance Systems		**Date:** 23 - 26/07 **Venue:** Rio de Janeiro Brazil **Participants:** 10
Containment and Surveillance Systems		**Date:** 22 - 25/10 **Venue:** Buenos Aires Argentina **Participants:** 13
Workshop on Inspection Procedures in Fabrication Plants		**Date:** 10 - 12/12 **Venue:** Resende Brazil **Participants:** 8

The New System of Joint Auditing Report (NSJAR) software developed by ABACC was presented during the ABACC-IAEA Joint Auditing System for Accounting Records (SJAR) courses, both in Brazil and in Argentina. The new functionalities introduced in the new software significantly facilitate this inspection activity.

7. INSTITUTIONAL ACTIVITIES

In 2019, ABACC was included in the United Nations Programme of Fellowships on Disarmament for the first time. ABACC is the first Southern Hemisphere institution to be awarded this distinction. The aim of the program, which was launched by the United Nations General Assembly in 1978 during its special session dedicated to disarmament, is to train and empower Member States' representatives to enable them to participate more effectively in discussions and negotiations forums on the subject.

25 scholarship holders from different countries had the opportunity to visit the headquarters of ABACC in Rio de Janeiro, and to learn about the history of the relationship of trust between Argentina and Brazil, which led the two countries to the establishment of ABACC, as well as the working dynamics of the SCCC and the inspection activities, amongst other things.

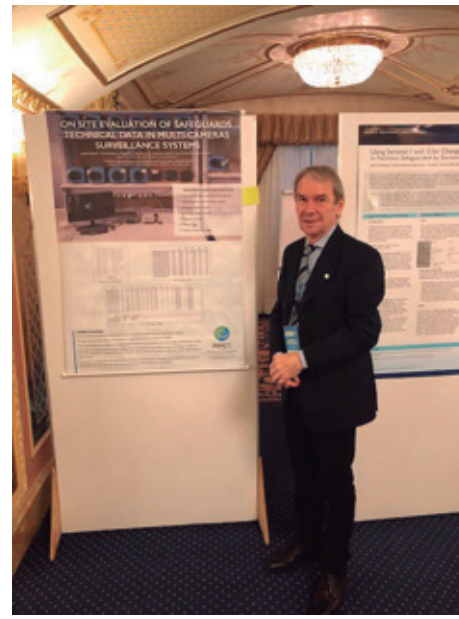
The participation of ABACC in international forums contributes to the dissemination of its activities and the exchange of information and experiences with representatives of other organizations.

ABACC officers participated in the following events, where they presented technical papers:

- "ABACC and the Safeguards Regional Systems", International Workshop on Safeguards, Safety, Security and Emergency Response, organized by the Brazilian Navy and the United States Department of Energy, February, Rio de Janeiro.
- "Safeguards Concepts Used in Modular Reactors", Advanced Reactor Safeguards Workshop, at the University of Texas, by the INMM – Student Chapter, April, Texas.
- "Nuclear Material Measurements at ABACC - Status Update", 41st ESARDA Annual Meeting Symposium, May, Stresa.
- "On Site Evaluation of Safeguards Technical Data in Multi-Cameras Surveillance Systems", 41st ESARDA Annual Meeting Symposium, May, Stresa.
- "International Certification Process of the ABACC-Cristallini Method for UF6 Sampling – Current Status", 41st ESARDA Annual Meeting Symposium, May, Stresa.
- "Experience in Safeguards Implementation at the Restart of a Refurbished CANDU Reactor in Argentina", 60th Nuclear Materials Management (INMM) Annual Meeting, July, California.
- "Proficiency Testing Program to Support Nuclear Material Measurements and Accountancy in Brazilian and Argentinean Laboratories at ABACC", 60th Nuclear Materials Management (INMM) Annual Meeting, July, California.
- "ABACC's Experience in the Use of Unattended Systems for Monitoring Spent Fuel in Power Reactors", 9th INMM/ESARDA/INMM – Japan Joint Workshop, October, Tokyo.
- Participation in EXPO INAC 2019 (International Nuclear Atlantic Conference) October, Santos.

"International Workshop on Safeguards, Safety, Security and Emergency Response" – Rio de Janeiro, Brazil

"Expo INAC 2019" – Santos, Brazil



41st ESARDA Annual Meeting– Stresa, Itália

ABACC also participated also in the following events:

- Meeting of the IAEA Board of Governors, March, Vienna.
- WIN (*Women in Nuclear*) Conference, Argentina, with the topic "Women of the Nuclear Sector Promoted the Debate on Climate Change", March, Buenos Aires.
- Lecture on "ABACC: Current Situation and Future Challenges", given by the Deputy Secretary at King's College London, May, London. The event was attended by 20 people, including doctoral students in the international relations, non-proliferation and safeguards, and nuclear security area.
- Presentation of the ABACC system and the regional safeguards model at the "Nuclear Nonproliferation, Safeguards, and Security in the 21st Century" degree program organized by the Brookhaven National Laboratory, June, New York.
- Meeting of the IAEA Board of Governors, June, Vienna.

Jornada Women in Nuclear WIN – Buenos Aires, Argentina

63rd IAEA General Conference – Vienna, Austria

Side Event: "ABACC Experience: Non-Proliferation and Safeguards through Regional Cooperation" – Vienna, Austria

- Third Session of the Preparatory Committee for the 2020 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, from April 29th to May 10th, New York.
- Meeting of the IAEA Board of Governors, September, Vienna.
- 63rd IAEA General Conference, September, Austria.
- Side Event: "Brazilian-Argentinean Agency for Accounting and Control of Nuclear Materials (ABACC) Experience: Non-Proliferation and Safeguards through Regional Cooperation", organized by ABACC and by the Argentinean and Brazilian Permanent Missions at the IAEA, September, in the margins of the IAEA 63rd General Conference, Vienna.
- Panel "Building Future Safeguards Capabilities: Insights from the 2018 Symposium on International Safeguards", organized by the Division of Concepts and Planning of the Department of Safeguards of the IAEA, September 17th, in the margins of the IAEA 63rd General Conference, Vienna.
- "Cycle of Lectures on Current Issues in International Law", promoted by the Federal University of Pampa (UNIPAMPA), in November, Rio Grande do Sul. Talk given by the Deputy Secretary called "Non-Proliferation and Nuclear Safeguards: Iran, North Korea and Other Challenges".
- Regional workshop "Strengthening the NPT Regime: Priorities for the 2020 NPT Review Conference", organized by the Nuclear Threat Initiative (NTI) and by the Nonproliferation for Global Security Foundation (NPSGlobal), in December, Rio de Janeiro.

Panel "Building Future Safeguards Capabilities: Insights from the 2018 Symposium on International Safeguards" – Viena, Austria

Workshop regional "Strengthening the NPT Regime: Priorities for the 2020 NPT Review Conference" – Rio de Janeiro, Brazil

"Cycle of Lectures on Current Issues in International Law", promoted by the Federal University of Pampa (UNIPAMPA) – Rio Grande do Sul, Brazil

LIST OF ABBREVIATIONS

ABACC	Brazilian–Argentine Agency for Accounting and Control of Nuclear Materials
IAEA	International Atomic Energy Agency
ANGRA 1	Nuclear Plant Almirante Álvaro Alberto – Unit 1
ANGRA 2	Nuclear Plant Almirante Álvaro Alberto – Unit 2
ASTM	American Society for Testing and Materials
ATUCHA I	Nuclear Power Plant President Juan Domingo Perón
ATUCHA II	Nuclear Power Plant President Dr. Néstor Carlos Kirchner
CANDU	Canadian Deuterium Uranium
DoE	United States Department of Energy
ESARDA	European Safeguards Research & Development Association
INMM	Institute of Nuclear Materials Management
INAC	International Nuclear Atlantic Conference
NBL	New Brunswick Laboratory
NGSS	Next Generation Surveillance System
NMRORO	Nuclear Material Round Robin
NPS Global	Nonproliferation for Global Security Foundation
NPT	Nuclear Non-Proliferation Treaty
NSJAR	New Joint Auditing System for Accounting Records
NTI	Nuclear Threat Initiative
SCCC	Common System of Accounting and Control of Nuclear Materials
SJAR	Joint Auditing System for Accounting Records
SoH	State of Health
UF_6	Uranium Hexafluoride
UNIPAMPA	Federal University of Pampa
WIN	Women in Nuclear

IMPRESSO

ABACC

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