

## **Safeguards Implementation by ABACC during the COVID-19 Pandemic**

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### **ABSTRACT**

The COVID-19 pandemic imposed unprecedented challenges to the health and the safety of the world. All aspects of human activities were severely affected. As many others, the activities aiming at verifying the commitment assumed by States with respect to the regime of non-proliferation of nuclear weapons had to be somehow adapted to keep accomplishing their objectives. In this context, safeguards field inspections are an important tool implemented by national, regional and international nuclear safeguards authorities around the world to deliver on their mandates and ensure that nuclear materials and activities are properly under control and in compliance with the undertakings assumed by the States. The Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials (ABACC) is a bilateral organization created by Argentina and Brazil in 1991 to verify that all nuclear materials in all nuclear activities conducted in the two countries are used exclusively for peaceful purposes. To comply with this objective, ABACC implements a Common System of Accounting and Control of Nuclear Materials (SCCC). The duties of ABACC include continuous interactions with the Department of Safeguards of the International Atomic Energy Agency (IAEA), State Authorities and facility Operators of Argentina and Brazil for planning and coordinating several verification activities, in particular the conduction of field inspections at nuclear facilities in the two countries. In order to achieve the verification objectives under the limitations imposed by the COVID-19 pandemic, the parties had to discuss and implement especial procedures in areas such as administration, logistics and management. As result, in 2020 ABACC was able to successfully conduct all essential field inspections in the two countries, with appropriate health and safety conditions of its staff, as well as personnel from all the other involved institutions. This paper describes the lessons learnt by ABACC during this unprecedented period and highlights the importance of multilateral cooperation as a fundamental mechanism to help overcoming difficult times.

### **INTRODUCTION**

As result of a remarkable political synergy that emerged in the 80`s and a joint decision to make their nuclear programs more transparent and focused exclusively on peaceful applications, in July 1991 Argentina and Brazil signed and ratified the Agreement for Exclusively Peaceful Use of Nuclear Energy (Bilateral Agreement), which established a Common System for Accounting and Control of Nuclear Materials (SCCC), and created ABACC to apply the SCCC in order to verify all nuclear materials in all nuclear

activities of the two countries [1]. In 1991, the two countries decided to insert the bilateral safeguards regime into the international non-proliferation regime, and signed a comprehensive safeguards agreement with the IAEA based on the SCCC - the "Quadripartite Agreement" [2]. The agreement that entered into force in March 1994 allows the IAEA to verify all nuclear materials in all nuclear activities in the two countries. Among other relevant regional and international commitments, once the actions in full support to the Treaty of Tlatelolco [3] were implemented, Argentina and Brazil adhered to the Treaty on Non-proliferation of Nuclear Weapons (NPT) [4] in February 1995 and September 1998, respectively. The Quadripartite Agreement was accepted as the safeguards agreement that fulfils the Tlatelolco and NPT obligations.

The goal of the SCCC is to ensure that all nuclear materials used in all nuclear activities in both countries are not diverted to nuclear weapons or other nuclear explosive devices. ABACC has the mission of overseeing the implementation of the SCCC based on terms established in the Bilateral Agreement. Therefore, the role of the State Authorities and the Facility Operators is of fundamental importance for the successful implementation of the system.

In order to fulfil its mission, ABACC has approximately 45 inspectors from each country to perform on-site inspections. The inspectors are indicated by the respective country and approved by the Commission of ABACC. They are not permanent staff of ABACC. Instead, they are specialists who perform activities in the nuclear area in their respective countries as employees of government organizations, including nuclear facilities. Therefore, they work for ABACC in a temporary basis, upon request of the Secretariat and authorization granted by the corresponding employee. During the period they work with ABACC they have privileges and immunities similar to the ABACC staff members. Inspections carried out in Brazil are performed by inspectors from Argentina and vice versa. This scheme assigns a unique feature to the SCCC in terms of implementation of nuclear safeguards.

The scheduling of the inspections conducted by ABACC has to be carefully coordinated with the IAEA and the State Authorities of Argentina and Brazil, as appropriate. Also, their frequency and intensity have to fulfil well established criteria stated in the Bilateral Agreement that depends mainly on the facility type, flow and inventory of the existing nuclear materials. Under normal conditions, a high level of coordination and cooperation between all parties involved is required to successfully implement a predefined annual inspection plan and achieve effective and efficient safeguards verification. The formal announcement of the COVID-19 pandemic by the World Health Organization in March 2020, and all preventive and protective measures globally implemented, made the planning and carrying out ABACC inspections more challenging.

### **IMPACT ON ABACC'S SAFEGUARDS IMPLEMENTATION**

Overall, despite the still significant reduction of the activities carried out in person in the ABACC Headquarters, the tools for secure remote working implemented by the IT personnel have demonstrated appropriate effectiveness. Several improvements in relevant safeguards databases and systems, including hardware upgrades, have been implement to

ensure secure, reliable and stable communication channels. ABACC staff is currently able to remotely access some of the relevant reporting databases while working at home or performing in-field activities. The Secretariat has provided enough flexibility in regards to the work arrangements to facilitate the adaptation of staff members and minimize the risk of contamination. Statements on the verification activities continue to be submitted to the States in a timely manner.

Local travel restrictions and decisions for the closing of borders have been the most important sources of logistical complications for ABACC to continue implementing in-field verification activities, in particular in Argentina. To overcome these difficulties, it has been of fundamental importance the support provided by State Authorities, including the Ministries of Foreign Affairs. Charter flights are being used to allow inspectors to travel between the two countries when commercial flights are not available due to temporary closing of borders. Since this solution involves significantly higher travel expenses, ABACC and the IAEA have worked together to share costs and responsibilities. Despite that, it is important to highlight that no extra-budgetary support from Argentina and Brazil was needed to accommodate this and other unexpected COVID-19 related expenses.

ABACC inspectors are playing a central role by accepting to fulfill their duties under unusual circumstances. During the pandemic, some of them have not been allowed by their employees to attend official missions as inspectors of ABACC, thus reducing the list of available inspectors. Despite these restrictions, appropriate replacements could be implemented with no major problems. In addition, since some of the permanent ABACC staff are also authorized to perform inspections, they were able to cover some of them during the year. Inspectors have to comply with safety protocols and follow strict physical distancing and personal protective measures during inspections. During approximately six months in 2020, mandatory quarantine for 14 days prior to the start of the inspections was required in Argentina. As result, in 2020 a total of 154 days was spent by inspectors in quarantine. At the end of the year, the quarantine requirement was suspended and waived on submission of negative PCR test results upon arrival in the country. Currently, each inspector must be tested for COVID-19 in average four times per mission. In addition, the length of some missions had to be extended to minimize the need for overlapping's and travels across borders. As result, the total number of temporary inspectors sent to official missions in 2020 was about 50% below the amount in the previous year, with no relevant reduction in the number of inspections and visits performed. So far, none of them has contracted the COVID-19 while conducting in-field verification activities. This clearly indicates the effectiveness of all health and safety precautions being implemented by the States and ABACC aiming at minimizing the risk of contamination during in-field activities.

In regards to the implementation of the annual inspection plan, although a large number of inspections and visits had to be rescheduled, efforts have been made to ensure that all time-critical and time-bound verification activities could be properly conducted. The most challenging situations were related to the ability to conduct short notice random inspections at fuel fabrication and conversion plants located in Argentina. To address this

limitation, ABACC agreed with the IAEA and the State Authority a temporary inspection scheme to maintain appropriate verification levels for transfers of nuclear materials. The maintaining of inspectors on stand-by in the countries for covering unannounced or short notice random inspections has been implemented under specific arrangements. As result, in 2020 all planned inspections and visits (DIV's) in Argentina and Brazil were performed, being the only exception a visit for design information verification in a facility under initial construction stage located in a region with limited access conditions. During the year, ABACC conducted a total of 184 inspections and visits, as detailed in the Table 1 [5, 6], with no relevant difference in comparison with the numbers from 2019 and the ones predicted in the 2020 annual inspection plan, noting that minor differences between subsequent years are normal mainly due to location outside facilities (LOF's) that are not inspected every year, DIV visits at facilities under construction and inspections in power reactors to verify spent fuels transfers to dry storages. On the other hand, technical activities for equipment maintenance, installation and upgrade had to be significantly reduced to the minimum necessary, focusing on the instrumentation needed for unattended monitoring of spent fuel transfers from storage ponds in power reactors to dry storages.

Table 1: Summary of the Verification Activities Performed by ABACC in 2019 and 2020.

	2020			2019
	Argentina	Brazil	Total	Total
Nuclear Facilities	25	50	75	77
Inspections and Visits	104	82	184	167
Verification Effort (pdi)	156	186	342	383
Quarantine (pdi)	154	0	154	Not applicable.

The activities related to the collection, transportation and analysis of environmental and nuclear material samples continue, albeit with some delays. In 2020, 34 nuclear material and 38 environmental samples were collected in the two countries. Since ABACC relies on the support and analytical services provided by external laboratories, some impact on the process was observed in 2020, mainly due to transportation issues. However, as the closing of the material balance periods for the most relevant bulk facilities were concentrated in the last quarter of the year, all results have been obtained at a still reasonable time frame. In mid-2021, laboratory operations and transportation processes were almost back to a normal status.

Training of inspectors has been severely affected. In 2020, only courses on the use of a recently upgraded nuclear material accountancy software have been delivered with support of remote learning tools, as part of the preparatory activities prior to missions in the field. In 2021, significant efforts are being employed towards re-designing and creating new training tools that can be effectively used as options to presential courses with large number of attendees.

## **CONCLUSIONS**

The COVID-19 pandemic heavily impacted the logistical aspects associated with the organization and conduction of ABACC in-field verification activities. A number of actions have been and continue to be taken to mitigate this impact. However, the fight against COVID-19 is not yet over and then a continuous review of the situation is important to support new remediation strategies and implement them in a timely manner. Mutual collaboration and efficient communication have been key elements for all safeguards players to jointly overcome these difficult times. The safety of all involved parties has been a common and high-level priority in carrying out safeguards verifications. As result, in 2020 ABACC was able to draw soundly-based conclusions about the exclusively peaceful use of nuclear facilities and materials in Argentina and Brazil. In 2021 the challenges remain, but the lessons learnt in 2020 are being of fundamental importance to support a more efficient planning of the in-field verification activities.

## **REFERENCES**

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

[3] Treaty for the Prohibition of Nuclear Weapons in Latin America and the Caribbean - Treaty of Tlatelolco, Agency for the Prohibition of Nuclear Weapons in Latin America and the Caribbean (OPANAL), February 1967.

[4] Treaty on the Non-proliferation of Nuclear Weapons, INFCIRC/140, International Atomic Energy Agency, April 1970.

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