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Fabio C. Dias¹, Lilia C. Palhares¹, Luiz A. de Mello¹, Hugo E. Vicens², Elena Maceiras², Gabriel Terigi²

¹ Brazilian Nuclear Energy Commission, Rio de Janeiro, Brazil, ² Argentine Nuclear Regulatory Authority, Buenos Aires, Argentina

Abstract

As result of the nuclear integration between Brazil and Argentina, in July 1991 the Agreement for Peaceful Uses of the Nuclear Energy (Bilateral Agreement) was signed and the Brazilian Argentine Agency for Accountancy and Control of Nuclear Material (ABACC) was created [1]. The main role assigned to ABACC was the implementation and administration of the regional control system and the coordination with the International Atomic Energy Agency (IAEA) in order to apply safeguards to all nuclear material in all nuclear activities of Argentina and Brazil. In December 1991 the IAEA, ABACC, Argentina and Brazil signed the Quadripartite Agreement (INFCIRC/435) [2]. The agreement establishes obligations similar to those established by model INFCIRC/153 comprehensive agreements. The Bilateral Agreement establishes that the Parties should make available financial and technical capabilities to support ABACC activities. In order to accomplish this challenge, the National Systems had to improve their structure and capabilities. Through the close interaction with the IAEA and ABACC, the national systems have been enriched by adopting new methodologies, implementing innovative safeguards approaches and providing specialized training to the regional inspectors. All of this also resulted in relevant technical improvements to the regional system as a whole. The approach of both neighborhoods controlling each other increased the confidence between the partners and permitted a better knowledge of their potentialities. The recognized performance of the regional system in the implementation of innovative, efficient and credible safeguards measures increased the confidence of the international community on the implementation of nuclear safeguards in Argentina and Brazil. In this paper, after twenty years of the creation of the ABACC System, the view of the Brazilian and Argentine National Authorities is presented.

Introduction

Research initiatives in the nuclear area developed by Brazil and Argentina, especially in the 80's and with involvement of military institutions, have aroused international suspicion that the countries were seeking to develop nuclear weapons. Realizing this negative atmosphere, both countries agreed to take actions in an attempt to demonstrate to the international community that the use of nuclear energy was intended only for peaceful applications. In 1980 the countries signed the Cooperation Agreement for Development and Application of the Peaceful Uses of Nuclear Energy [3]. In the same decade, several joint declarations on its nuclear policies were announced by the countries. In 1988, Brazil decided to include the same principle in its constitution and to attribute to the Congress the responsibility for approving any nuclear activity to be carried out in the Brazilian territory. Later, the countries decided to strengthen the approximation in the nuclear area through the creation of a Permanent Committee on Nuclear Policy, which adopted the scientific-technical cooperation as its main pillar and was aimed primarily to demonstrate transparency in their nuclear programs. However, the most significant initiative in this direction occurred in 1991 when the two countries

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), created ABACC and implemented a system of mutual inspections between them. The IAEA safeguards in the two countries had been applied since the 60's through specific agreements, but the establishment of the SCCC and the creation of ABACC conducted to the signature of a new agreement between Argentina, Brazil, ABACC and the IAEA in 1994 - the so-called "Quadripartite Agreement". Soon after, in May 1994, the Treaty on the Prohibition of Nuclear Weapons in Latin America (Tlatelolco Treaty) [4] entered into force for Brazil, and in September 1998 the country adhered to the Treaty on Non-proliferation of Nuclear Weapons (NPT) [5]. Argentina ratified its adherence to the dealings of Tlatelolco in January 1994 and to the NPT in February 1995.

The SCCC and the structure of ABACC

The SCCC, established by the Bilateral Agreement, has the goal to verify that all nuclear materials used in all nuclear activities in both countries are not diverted to nuclear weapons or other nuclear explosive devices. ABACC is an international organization that aims to administrate the implementation of the comprehensive safeguards system (SCCC) established by the Bilateral Agreement. ABACC has two bodies: the Commission and the Secretariat. The Commission of ABACC is comprised of four members, two from Argentina and two from Brazil, all appointed by the respective governments. The Commission approves the regulations for operation of ABACC, supervises the work of the Secretariat, approves its technical officers and informs of any abnormalities to the corresponding Party, which will be required to take all the necessary actions to remedy the situation. The Secretariat of ABACC is formed by a Secretary and a Deputy Secretary, with nationalities alternating each year, a group of eight Technical Officers (four from each country), administrative staff and approximately 90 inspectors nominated by the countries and approved by the Commission. The inspectors are usually specialists who perform activities in the nuclear area in their respective countries as members of the National Authorities or as employees of other official organizations of the nuclear area. Therefore, they are inspectors who work for ABACC in a temporary basis, upon request of the Secretariat. Inspections carried out in Brazil are necessarily performed by inspectors from Argentina and vice versa. It should be noted that the Technical Officers of the Secretariat, who are permanent staff of ABACC, can also perform inspections. This scheme assigns a unique feature to the SCCC in terms of implementation of nuclear safeguards in the world.

The Quadripartite Agreement

As stated earlier, both Argentina and Brazil were already signatories of safeguards agreements with the IAEA when the SCCC was established and ABACC created. Immediately after the signing of the Bilateral Agreement, in the same month of December 1991, Argentina, Brazil, ABACC and the IAEA signed the Quadripartite Agreement for the joint application of safeguards by the IAEA and ABACC in both countries. The Agreement considers that each agency shall reach its own conclusion in terms of accomplishment of the Agreement by the Parties, while avoiding unnecessary duplication of efforts. The Agreement entered into force in March 1994 and represented a milestone in the international regime of nuclear non-proliferation by presenting a model of bilateral application of comprehensive safeguards. The Quadripartite Agreement was prepared with the same principle that the NPT in regards to application of comprehensive IAEA safeguards, although the countries had not yet signed such a

Treaty. The obligations of the countries under the Quadripartite Agreement are well known, as they are similar to those valid for signatories of model INFCIRC/153 agreements with the IAEA.

The National Nuclear Material Control Systems in Argentina and Brazil

In Brazil, the government's efforts for establishing an independent system of control of nuclear materials became more evident in the early 80s. At that time, the Brazilian government was implementing a standalone program to develop nuclear technology in order to acquire appropriate capacity to use nuclear energy according to the needs of the country. The Nuclear Energy Commission of Brazil (CNEN) was the Brazilian government organization responsible for performing such a control, a situation that persists today. To meet its commitments at the national level, CNEN established an appropriate structure, including technical and laboratorial support, capable of performing a domestic control totally independently of the international control applied by the IAEA so far. CNEN is empowered to issue regulatory documents that establish requirements for nuclear material control by operators of nuclear installations, as well as to issue authorizations for the use and transfer of such material.

From 1956 to 1994, the nuclear regulatory function in Argentina was carried out by the "Atomic Energy Commission". In 1994, the Argentine government decided to split into three different organizations the management of the generation and the use of nuclear energy from the regulation of such activities. Since then, the regulatory activities have been carried out by the Nuclear Regulatory Authority (ARN).

In this framework, the Nuclear Regulatory Authority (ARN) has, among its functions, to ensure that the nuclear material and activities are not deviated to any unauthorized purpose and that they are performed in compliance with all the international undertakings and commitments assumed by Argentina.

Since 1994, the ARN has developed a complete set of measures and procedures, called National Standard, that are applicable to all nuclear materials, equipment, installations and materials of nuclear interest. These National Standards empowered ARN with all the attributes of an independent State System of Accounting and Control (SSAC) that regulates all the nuclear activities within the State at national level.

The infrastructure for nuclear material control existing in Argentina and Brazil at the time of the creation of ABACC was fundamental for its establishment in the first phase, especially with regard to human capital, as officials from the governments of Argentina and Brazil who were permanent staff of the National Authorities were nominated by their governments to form part of the Secretariat of ABACC. A similar situation occurred with respect to the structure for training and some equipment used in inspections, which were lent to ABACC until it could acquire their own equipment.

With the signing of the Quadripartite Agreement and sometime after the start of the joint inspections regime of the IAEA and ABACC in both countries, the role of National Authorities gained even more importance, especially because, according to the Bilateral Agreement, the National Authorities should provide the necessary support to ABACC so that it could fulfill its mission successfully.

Impact of the Regional Safeguards System on the Activities of the National Authorities

The unique characteristics associated with the SCCC in terms of application of safeguards caused significant structural and operational impact on the activities performed by the National Authorities of Argentina and Brazil. The main points that have suffered this influence are presented below:

- **Temporary Inspectors:** This is perhaps one of the main particularities the SCCC. ABACC inspectors are permanent staff of the National Authorities or other official organizations of the nuclear area. Some of them routinely act as operators of nuclear facilities (power and research reactor, fuel fabrication and conversion plants, laboratories, etc.) and, therefore, undergo routine inspections of both the IAEA and ABACC. This variety of tasks offers inspectors the opportunity to better understand both sides of the system, to be constantly informed of advances in both areas and, especially, understand the importance of implementing adequate control of nuclear materials and apply these concepts more efficiently in their routine work. The application of domestic safeguards tends to be improved when there are operators who are also temporary inspectors of ABACC. In the case of the staff of the National Authorities, experience as an inspector of the regional system contributes significantly to a better implementation of its routine work due to the more diverse capacitation in-deep knowledge about different processes, technologies and types of nuclear facilities that, sometimes, do not exist in their own country. To ABACC, there is a distinct gain to have inspectors who understand well the various types of facilities (operators) and have the experience to perform daily tasks associated with control and accountancy of nuclear material (national inspectors).
- **Communications, Information Exchange and Coordination of Activities:** According to the Quadripartite Agreement, ABACC concentrates almost all of the information related to international safeguards applied in Argentina and Brazil. This makes ABACC a critical point in the flow of information. However, while the IAEA deals with information related to dozens of countries, ABACC deals only with two. Typically, this allows greater agility in handling and analyzing the information not only for ABACC, but also for the States. The discussion forums foreseen in the SCCC (bilateral and trilateral meetings) allow better flexibility in negotiations until a certain level. In addition, the logistics related to meetings between Argentina, Brazil and ABACC within the SCCC is facilitated by the proximity between the neighbors and the offices of ABACC. The work of ABACC in planning and coordination of the activities to be performed in the two countries improves the process of analysis, approval and implementation of such activities.
- **Infrastructure:** The responsibility assigned by the Bilateral Agreement to National Systems of Argentina and Brazil in providing the necessary support to ABACC to perform its mission effectively, meant that countries had to constitute adequate material and human resources so that they could meet this dual function of conducting the domestic control and meeting possible demands from ABACC. As a result, both National Authorities maintain a wide range of equipment, materials, computer programs and other tools used for physical verification and accountability of nuclear materials. The infrastructure for

laboratory analysis in the area of safeguards in both countries has also suffered a strong influence, since ABACC uses it for obtaining results of analysis of samples collected by its inspectors.

- Training: This point of influence is strongly related to the topic “temporary inspectors”. Inspectors of the National Authorities who are also inspectors for ABACC receive additional periodic training in various types of activities they need to perform as inspectors of the regional system. The workouts are specific, often provided by high-level experts, and cover a wide variety of procedures, equipment and techniques. The knowledge obtained during these trainings usually has direct impact on their daily activities as staff of the National Authorities or operators. Moreover, several of the training equipment of ABACC is available to inspectors for training in non-routine basis, in case this need is appropriately identified.

Current and Future Challenges

The growing up of the nuclear activities in Argentina and Brazil has imposed to ABACC and the respective National Authorities additional challenges in regards to limited financial and human resources to accomplish the same objectives. The organizations have to seek for more efficient methods and approaches in order to save resources. The know-how in nuclear safeguards is usually concentrated and takes 5 to 10 years for being transferred to new generations. The National Authorities of Argentina and Brazil have to dedicate special attention to this problem and consider that ABACC could play an important role in this challenge.

Conclusions

After twenty years of the SCCC and ABACC, Argentina and Brazil have experienced significant changes in the way external safeguards is applied for both countries. The existence of the regional system brought into the game the atmosphere of mutual confidence that nuclear energy is used only for peaceful purposes. The close interaction with ABACC allows the States to deal with safeguards related topics in a routine basis, optimizing the implementation process. Improvements in the capacity to apply domestic safeguards were also noticed by the respective National Authorities, since the Bilateral agreement requires that the States have the adequate capacity to support ABACC whenever necessary. Argentina and Brazil believe that safeguards can be much more efficient if the capabilities of the state systems are taken fully into consideration and a well-established regional system is recognized as an indicator of fully accomplishment of international safeguards commitments by the Parties.

References

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[3] Cooperation Agreement for Development and Application of the Peaceful Uses of Nuclear Energy, Official Publication of the Brazilian Government , n° 215, November 1983.

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