

AMENDING THE SMALL QUANTITIES PROTOCOLS- LESSONS LEARNED ON SAFEGUARDS IMPLEMENTATION

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ABSTRACT

The International Atomic Energy Agency (IAEA) has made a call to all States with a comprehensive safeguards agreement (CSA) with original-text small quantities protocol (SQP) to amend or rescind the SQP. For the IAEA, the amended SQP (mSQP) increases the effectiveness of safeguards by addressing some limitations that have been identified in the original SQP. The mSQP strengthens the IAEA's ability to draw credible safeguards conclusions for States with minimal or no nuclear material or activities.

A State amending its SQP needs to ensure that it can fulfill its legal obligations under the mSQP. The process of amending the SQP includes discussion at the highest governmental levels, coordination with all stakeholders, and consultation with the IAEA. In addition, the State may need to enact new or modify existing legislation to incorporate its safeguards obligations, a process that can be lengthy depending on the resources and priorities of the State. Within the mSQP framework, the State should designate a State or regional authority responsible for safeguards implementation (SRA) that will establish and maintain the State system of accounting for and control of nuclear material (SSAC), submit its initial report on all nuclear material subject to safeguards and facilitate safeguard inspections. The State must ensure that the SRA and all the stakeholders have the tools, training and resources to fulfill their safeguards-related legal obligations. The intention of this paper is to share the lessons learned during the process of amending the SQP and for the first IAEA safeguards inspection in a particular State: Brunei Darussalam.

Discussion and close cooperation between the IAEA, government officials, and the SRA were key for the successful implementation of the mSQP. The paper describes the implementation of Brunei Darussalam's safeguards obligations following the signing of the mSQP in 2021 and may serve as a road map for other States that are in the process of amending their respective SQPs.

BACKGROUND

Brunei Darussalam is located in Southeast Asia and has been actively utilizing peaceful nuclear technologies for many years due to active oil and gas exploration, which is the main source of revenue for the State. Despite the absence of nuclear power plants or other nuclear facilities in the State, there is a diverse use of nuclear applications that ranges from non-destructive testing and

quality control of materials in the industrial sector to production of radiopharmaceuticals for medical diagnostics and therapies in the medical sector.

Brunei Darussalam has a long-standing commitment to nuclear disarmament and non-proliferation as demonstrated through active participation in international efforts to strengthen nuclear safeguards and promote the peaceful use of nuclear technology worldwide. Brunei Darussalam became a party to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) in 1985 and subsequently concluded a Comprehensive Safeguards Agreement (CSA) with the International Atomic Energy Agency (IAEA) in 1987, which establishes the legal and technical framework for the implementation of the non-proliferation treaty in the State. It became a Member State of the IAEA in September 2014.

Brunei Darussalam has limited nuclear-related activities, as the State does not have nuclear power plants, research reactors, or fuel cycle facilities. The only form of nuclear material present in the State is depleted uranium used as shielding in gamma projectors for industrial radiography. Due to the absence of nuclear facilities and the small amount of nuclear material, Brunei Darussalam chose to conclude a Small Quantities Protocol (SQP) to its CSA, which would allow a commensurate reduction in its safeguards reporting obligations.

The SQP is a protocol made available to States with minimal or no nuclear material and no nuclear material in a “facility” (as defined in INFCIR/153/Corr.) that may be concluded in conjunction with a CSA.

LEGAL AND REGULATORY FRAMEWORK

Brunei Darussalam put in place a legal and regulatory framework for nuclear safety and safeguards when the Radiation Protection Act, Chapter 228 (RPA) was enacted in December 2018. The RPA sets out a system for the control of nuclear and radioactive materials and the provision of guidance towards radiation protection and non-proliferation of nuclear weapons; it forms the legal framework for governing all nuclear and radiation activities, including the implementation of IAEA safeguards obligations. In the same year when the Act was enacted, the Safety, Health and Environment National Authority (SHENA) was established to act as the State Regulatory Authority (SRA) responsible for implementing the Act.

Prior to the RPA and the establishment of SHENA, there had been challenges to ensure the safe and secure use of nuclear materials in relation to international legal instruments due to the absence of a robust legal regulatory framework and limited capacity and capability. Since the enactment of the RPA, Brunei Darussalam through SHENA began undertaking numerous efforts to strengthen the radiation regulatory infrastructure. One of the priorities was a review of commitments towards IAEA legal instruments. Recognizing the importance of expressing political commitment coupled with the availability of committed human resources in SHENA to execute safeguards duties, the review recommended concluding an Amended Small Quantities Protocol (mSQP). Initiated with the direct involvement of SHENA’s technical and legal teams and relevant government ministries, and with the IAEA providing timely and valuable support, Brunei Darussalam was able to conclude the mSQP in September 2021.

The mSQP allows the IAEA to improve the effectiveness of its safeguards implementation at headquarters and in the field by: (1) expanding the safeguards-relevant data declared by the State, including the declaration of all nuclear material and its location through an initial inventory report; and (2) permitting IAEA safeguards inspections in the State.

BUILDING UP CAPACITY IN THE STATE

The desire to establish the first national cancer centre (known as The Brunei Cancer Centre) was one of the triggering factors that drove Brunei Darussalam towards membership in the IAEA in 2014, whereby IAEA support was valuable towards successful establishment of the Radiotherapy Department and Nuclear Medicine Department at The Brunei Cancer Centre. As described above, a few years later SHENA was established with a clearly defined mandate to implement the RPA, which enabled the strengthening of Brunei Darussalam's regulatory infrastructure. Even though there was a level of regulatory control on nuclear applications (including industrial radiography) in the State prior to enactment of the RPA, the absence of a legal framework to govern all nuclear and radiation activities made the regulatory activity challenging, on top of other difficulties such as limited human resource capacity and capability.

One of the top government priorities (prior to the establishment of SHENA in 2018) was to establish a single national authority to regulate workplace safety and health, including radiation matters. SHENA was established to implement not only the RPA, but also the Workplace Safety and Health Order, 2009 (WSHO). Human resources from the Department of Energy, Prime Minister's Office (known then as the Energy and Industry Department, Prime Minister's Office) and Radiation Safety and Quality Unit (RSQU) under the Prime Minister's Office were sourced to form the basis of SHENA to implement the two laws.

In order to accelerate the expansion and further strengthening of radiation regulatory infrastructure, expatriates were sourced from well-established regulatory bodies in the region to support and provide expertise. In less than 3 years, SHENA has successfully refined the radiation licensing processes, established dedicated enforcement and technical support functions, as well as supported the State in becoming signatory to a number of legal instruments contributing to strengthening of the legal and regulatory framework, of which one was the mSQP.

Additionally, SHENA utilized the competency-enhancement opportunities provided by other international agencies and participated in workshops organized by US DOE in the year 2022, by which SHENA achieved better understanding of the safeguards framework and implementation of its mSQP obligations.

FULFILLING THE REQUIREMENTS OF THE mSQP

SHENA strongly emphasizes the capacity building of existing human resources in implementing the RPA. The radiation regulatory body is comprised mostly of junior officers (less than 5 years of working experience), hence a structured training plan was formulated to build on the

competencies with the support of the IAEA. However, the COVID-19 pandemic negatively impacted the established organizational training plan towards specific competency development of the staff. Safeguards competency therefore is developed mainly through self-initiative in utilizing the resources made available by the IAEA, such as Service Series 22.¹

Shortly after signing of the mSQP in September 2021, SHENA made efforts towards submission of the initial inventory report, with the support of the responsible IAEA operations division. The SHENA Safeguards Team (under the Enforcement Division) was established to submit the required information to the IAEA. With the existing national database of radiation sources in place and updated in a timely manner, extraction of nuclear material statistics was completed without much difficulty. The main challenge was the absence of specific information on the nuclear material (i.e., weight of nuclear material in each item) and the capability to export from the database in the required format for submission. With the strong support and existing relationships established with all licensees, the required information was acquired. Despite the availability of IAEA resources, such as Service Series 22, to guide towards accurate submissions, the lack of systematic training (specific to safeguards) was evident. Multiple submissions with support and specific guidance from the IAEA eventually led to accurate submission of the initial inventory report.

In February 2022, Brunei Darussalam accepted the designation of IAEA safeguards inspectors as part of its safeguards obligations under the mSQP. The acceptance of designated inspectors allows the IAEA to perform inspections, such as for the purpose of verification of the initial inventory report.

PREPARATION FOR THE FIRST INSPECTION

Following the submission of the initial inventory report, Brunei Darussalam welcomed IAEA safeguards inspectors to verify the submitted information through physical inspection at declared locations in October 2022. This inspection, in line with the provisions of the mSQP, allowed the inspectors to verify the declared nuclear material and the accurate accounting of nuclear materials in the State.

Communication between SHENA and the IAEA was key to enabling suitable arrangements to be made prior to the inspection to ensure the effective implementation. The arrangements included provision of entry visas, logistics arrangements, and availability of key participants including the SHENA Safeguards Team and Radiation Protection Officers for every declared location. Cooperation from the operators was also vital to support the inspection, and this was attained through the professional and respectful relationship established between SHENA and all the licensed operators as part of the regulatory strategy in implementing the RPA in Brunei Darussalam.

In order to maximize the benefit of the inspection visit of IAEA safeguards inspectors to Brunei Darussalam, a two-day workshop was also planned and incorporated into the programme to

¹ IAEA Guidance on Safeguards Implementation Guide for States with Small Quantities Protocols (IAEA Service Series 22) <https://www.iaea.org/publications/10493>

promote safeguards awareness to the relevant stakeholders, especially government agencies such as the Royal Brunei Police Force, Royal Customs and Excise Department, etc. This workshop was beneficial and achieved its objective of imparting an understanding of the importance of safeguards obligations, which the participating stakeholders committed to support.

INTERACTION WITH IAEA

Even before the signing of the mSQP by Brunei Darussalam in September 2021, there was already active communication established between SHENA and the IAEA's Safeguards Country Officer for Brunei Darussalam. The interaction not only enabled Brunei Darussalam to clarify the IAEA's expectations regarding the State's safeguards obligations, but also facilitated providing valuable guidance in terms of safeguards knowledge and the approach for implementation. This relationship fostered good cooperation and trust, and assured the State of the IAEA's continued support for promotion of peaceful uses of nuclear applications.

LESSONS LEARNED, RECOMMENDATIONS AND EXPERIENCE GAINED

In conclusion, the first-ever IAEA safeguards inspection to Brunei Darussalam was successfully conducted by IAEA safeguards inspectors in October 2022 following acceptance of the mSQP and submission of the initial inventory report. Verification activities during the inspection provided the IAEA assurance of the State's compliance with safeguards obligations and also reinforced that the State has consistently promoted the safe and secure use of peaceful nuclear technology worldwide. In addition, Brunei Darussalam has further demonstrated strong commitment towards the NPT as well as to the IAEA's legal instruments through collaborative work with the IAEA in further strengthening national safeguards.

Brunei Darussalam remains actively involved in related activities such as those sponsored by the IAEA, Asia-Pacific Safeguards Network (APSN), US DOE, etc. SHENA's involvement with these activities has significantly enhanced their capability to implement the State's safeguards obligations, and serves as a platform to gain insights through experience-sharing and professional networking with other regulatory agencies.

The IAEA has recognized the commitment of Brunei Darussalam and the steps taken to fulfill their legal obligations under the mSQP. Furthermore, the IAEA recognizes the strong effort of SHENA toward the assurance of the completeness and correctness of their initial inventory report. The responsive communication between SHENA and the IAEA, the dialogue of the SRA liaising between all the government agencies and stakeholders and the excellent preparation and commitment of SHENA improved the ability of the IAEA to draw credible safeguards conclusions for the State.