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Strengthening the NPT Safeguards Regime for Naval Nuclear Propulsion Development: Event Summary

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Contents

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Acronyms

ABACC	Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials
AP	Additional Protocol
AUKUS	Trilateral Security Partnership between Australia, United Kingdom and United States
CSA	Comprehensive Safeguards Agreement
HEU	Highly enriched uranium
IAEA	International Atomic Energy Agency
LEU	Low enriched uranium
NNP	Naval nuclear propulsion
NNWS	Non-nuclear-weapon States
NPT	Treaty on the Non-Proliferation of Nuclear Weapons
NWS	Nuclear weapon States

Introduction

Luiza Delaflora Cassol and James Revill

The topic of naval nuclear propulsion (NNP) has garnered significant attention from the States Parties to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) and Member States to the International Atomic Energy Agency (IAEA). Divergent views on this issue have been put forward. For this reason, Indonesia convened a side event on naval nuclear propulsion on 25 July 2024 on the sidelines of the Second Preparatory Committee for the 2026 Review Conference of the Parties to the NPT in Geneva.

At this event, the Indonesian organisers invited countries that had submitted working papers on NNP at the 2022 NPT Review Conference — including countries currently developing this technology — and the IAEA, to engage in further discussions on this issue. In doing so, Indonesia hoped to foster an informed discussion on NNP programmes and address some of the fundamental questions that have arisen on this topic.

The United Nations Institute for Disarmament Research (UNIDIR) was delighted to play a supporting role in this Indonesian event by facilitating the discussion as well as providing background material on the topic of NNP. Some 75 participants from more than 25 States, four international organizations and eight academic or non-governmental organizations participated in this side event, which provided a space for informal dialogue on the development of NNP.

This short report summarizes the discussions during the event. It begins with brief welcome remarks from Mr. Caka Alverdi Awal, Director for International Security and Disarmament, Ministry of Foreign Affairs of the Republic of Indonesia. The report then provides a summary of remarks from Ambassador Ian Biggs, Australian Ambassador and Resident Representative and Governor to the Board of Governors

of the International Atomic Energy Agency (IAEA) and Australia's Permanent Representative to the United Nations in Vienna, and Ambassador Marcelo Câmara, Director of the Department of Strategic, Defence and Disarmament Affairs at the Brazilian Ministry of Foreign Affairs.

Next, the report summarizes the remarks of Ambassador Shen Jian, Deputy Permanent Representative of the People's Republic of China to the United Nations Office at Geneva and other International Organizations in Switzerland and Ambassador Extraordinary and Plenipotentiary for Disarmament Affairs. Subsequently, the remarks from Ms. Meena Singelee, Head of the IAEA Liaison Office in Geneva, and Dr. Pavel Podvig, Senior Researcher with UNIDIR, are outlined, followed by an overview of the discussion among participants. The report concludes with closing remarks from H.E. Achsanul Habib, Deputy Permanent Representative of the Republic of Indonesia to the United Nations and other International Organizations in Geneva.

Welcome remarks from Indonesia

Summary of remarks by Mr. Caka Alverdi Awal, Director for International Security and Disarmament, Ministry of Foreign Affairs of the Republic of Indonesia.

In his opening remarks, Mr. Caka Alverdi Awal welcomed participants to the side event hosted by the Government of the Republic of Indonesia and supported by UNIDIR. He indicated that the topic of naval nuclear propulsion has generated interest from NPT States Parties, including at the last NPT Review Conference in 2022. He noted that four Working Papers were submitted on this issue,[1] and there

1 China. *Nuclear submarine cooperation among Australia, the United Kingdom of Great Britain and Northern Ireland, and the United States of America*. Working Paper, NPT/CONF.2020/WP.50, 2020 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, 27 December 2021. **https://documents.un.org/doc/undoc/gen/n21/418/75/pdf/n2141875.pdf**. Australia, the United Kingdom of Great Britain and Northern Ireland and the United States of America. *Cooperation under the AUKUS partnership*. Working Paper, NPT/CONF.2020/WP.66, 2020 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, 22 July 2022. **https://documents.un.org/doc/undoc/gen/n22/436/54/pdf/n2243654.pdf**. Indonesia. *Nuclear naval propulsion*. Working Paper, NPT/CONF.2020/WP.67, 2020 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, 25 July 2022. **https://documents.un.org/doc/undoc/gen/n22/436/91/pdf/n2243691.pdf**. Brazil. *Brazil's naval nuclear propulsion programme and the safeguards regime under the Treaty on the Non-Proliferation of Nuclear Weapon*. Working Paper, NPT/CONF.2020/WP.71, 2020 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, 3 August 2022. **https://documents.un.org/doc/undoc/gen/n22/450/84/pdf/n2245084.pdf**.

was a wide spectrum of opinions on the development of NNP programmes. Moreover, the issue had been highlighted in a paragraph of the draft Final Document of the NPT Review Conference. Although this draft Final Document was not adopted due to other issues, Mr. Alverdi Awal suggested common understanding on the importance of transparent and open dialogue on this topic had emerged.

Indonesia convened the side event to provide an open and transparent avenue for dialogue on the development of NNP, with the objective of contributing to the strengthening of the safeguards and non-proliferation regime and ensuring the adaptability of these measures in responding to emerging issues, such as NNP. Mr. Alverdi Awal indicated that Indonesia was fully aware that deliberations on this issue have been ongoing in Vienna and that Indonesia was following closely. He emphasized that Indonesia continued to recognize the IAEA as the sole competent authority on the safeguards regime. However, Indonesia also believed open and inclusive dialogue around this issue would strengthen existing safeguards and ensure the NPT's adaptability in responding to emerging issues.

Mr. Alverdi Awal proceeded to thank panellists and reiterated Indonesia's commitment to transparency and international peace, adding that Indonesia hoped to play a role in building bridges on this critical discourse. In conclusion, he suggested that in the current volatile global situation, it was vital to create a conducive environment for dialogue and diplomacy in addressing an issue where divergences exist so that States could work together towards the shared goals of nuclear disarmament, non-proliferation, and the peaceful use of nuclear energy.

An Australian perspective

Summary of remarks by H.E. Ambassador Biggs, Australian Ambassador and Resident Representative and Governor to the Board of Governors of the International Atomic Energy Agency. Australia's Permanent Representative to the United Nations in Vienna.

Ambassador Biggs focused his remarks on three areas: first, an overview of Australia's safeguards and verification approach to their naval nuclear propulsion programme, elaborating on how this was being developed within the framework of Australia's existing safeguards agreements. Second, a recap of Australia's pathway towards the acquisition – then safe and secure operation and sustainment – of conventionally armed, nuclear-powered submarines under the Trilateral Security Partnership between Australia, United Kingdom and United States (AUKUS); and third, how Australia and the AUKUS partners are progressing on this topic within the NPT safeguards framework – and the IAEA's role and mandate on this.

On Australia's NNP programme, Ambassador Biggs outlined how Australia's planned acquisition of conventionally armed, nuclear-powered submarines was operating in accordance with the 'Optimal Pathway', announced in March 2023. This was a phased approach that Australia had developed to change the way they power the propulsion in their conventionally armed submarines; specifically, they planned to move from six diesel-powered submarines to eight nuclear-powered submarines, a process that will continue until the second half of this century.

Ambassador Biggs went on to highlight three important elements of Australia's NNP programme, which distinguish the Australian approach and demonstrate their commitment to the highest non-proliferation standards. First, the fact that Australia has committed not to undertake enrichment, reprocessing or fuel fabrication in support of their NNP programme; second, the nuclear material transferred to Australia for NNP will be received in complete, welded reactor power units that are designed in such a way that the removal of any nuclear material would be highly complex and render the power unit and submarine inoperable; and third, the nuclear fuel – or high enriched uranium – that Australia will receive in these power units cannot be used in nuclear weapons without further chemical processing. Such chemical processing would require facilities that Australia does not have – and will not seek. Moreover, the IAEA will be able to verify the absence of such facilities.

The Australian representative proceeded to outline Australia's non-proliferation approach, indicating that Australia and the IAEA are engaging in the development of a robust safeguards and verification approach for Australia's NNP programme and that this approach would operate within the framework of Australia's Comprehensive Safeguards Agreement (CSA) and Additional Protocol (AP) with the IAEA. Ambassador Biggs indicated that NNP was foreseen by the drafters of the NPT and a legal mechanism for NNP was provided for in article 14 of the model CSA, which was approved by the Board of Governors in 1971 and served as the basis for CSAs subsequently agreed with States. The IAEA Director General has stated this provision was developed with the specific intent to address the use of nuclear material required to be safeguarded under a comprehensive safeguards agreement, whether produced domestically or imported, for NNP. This is part of the legal framework set out in safeguards agreements – including in Australia's bilateral CSA – and the other CSAs approved by the Board in the past 50 years. It was noted that Australia is committed to developing a robust safeguards and verification approach, including an article 14 arrangement that will ensure the IAEA can continue to meet its technical objectives in terms of verifying non-diversion of nuclear material, no misuse of nuclear facilities, and no undeclared nuclear material or activity in Australia, hence setting the highest non-proliferation standard for States that might also seek to acquire NNP capabilities. Australia has made clear that, under their article 14 arrangement, the IAEA will maintain oversight of all nuclear material. Moreover, the approach developed with the IAEA will include a robust package of verification measures. Ambassador Biggs recognized this involves complex technical factors and indicated that the technical considerations involved in developing a non-proliferation approach for a NNP programme will reflect factors that are specific to the programme concerned and fit-for-purpose, rather than one-size-fits-all.

Ambassador Biggs stated that the IAEA's bilateral engagement with non-nuclear-weapon States (NNWS) pursuing NNP was within the established legal framework and highlighted that all the IAEA Member States share an interest in protecting their fundamental right to engage bilaterally and in confidence with the Agency on the implementation of their safeguards agreements. He added that the global nuclear non-proliferation regime relies on such engagement.

In concluding, Ambassador Biggs discussed IAEA safeguards and the role of the IAEA Secretariat and the Board. He noted that Australia has long championed efforts to preserve and strengthen the non-proliferation and disarmament regime, with the NPT as its cornerstone and that the IAEA safeguards system remains vital to the NPT's success in stopping the spread of nuclear weapons. In turn, this depended on the IAEA Secretariat's ability to exercise its independent, technical mandate and authority

to develop and implement safeguards arrangements with IAEA Member States, bilaterally and in-confidence, and to draw conclusions regarding Member States' compliance with their safeguards obligations. It was stated that in the context of NNP, the IAEA Director General has specifically said that the IAEA has "significant experience in applying safeguards… to many types of facilities, including reactors using different types of fuel"; and "the necessary experience to develop the arrangements related to the use of nuclear material for naval nuclear propulsion in accordance with the Statute and the relevant safeguards agreements".

Moreover, the Director General has committed to continue updating the IAEA Board on NNP, as he deems appropriate. Once Australia's article 14 arrangement has been developed, the Director General has made clear that it will be transmitted to the IAEA Board of Governors for appropriate action. When that occurs, Australia expects it to be judged on its non-proliferation merits. In other words, on whether it enables the IAEA to fulfil its technical objectives. Ambassador Biggs closed by reiterating that Australia will continue to provide updates and engage with genuine questions, at the IAEA Board and in other fora.

A Brazilian perspective

H.E. Ambassador Marcelo Câmara, Director of the Department of Strategic, Defence and Disarmament Affairs, Brazilian Ministry of Foreign Affairs.

Ambassador Câmara divided his remarks into three parts: first, he covered Brazil's naval nuclear programme; second, Brazil's naval nuclear programme and its international non-proliferation obligations; and third, negotiations with the IAEA on special procedures pursuant to article 13 of the Quadripartite Agreement.[2]

In relation to Brazil's naval nuclear programme,[3] Ambassador Câmara stated that the development of a fully indigenous, autonomous nuclear propelled submarine was a long-standing objective that Brazil had pursued since 1979. He stressed that the submarine, its nuclear reactor, and the fuel were being designed, developed, built, and assembled in Brazil. The submarine will be a nuclear-powered, conventionally armed vessel with a reactor using low-enriched uranium, produced in a dedicated facility operated by the Brazilian Navy, that will enrich uranium and manufacture the fuel elements of the naval reactor. In addition, the Navy is building a land-based prototype of the naval reactor (LABGENE), which

2 Argentina, Brazil, the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials, and the International Atomic Energy Agency. *Agreement of 13 December 1991 for the Application of Safeguards*. INFCIRC/435, March 1994. https://www.iaea.org/sites/default/files/infcirc435.pdf.

3 Ibid.

is being finalized and will be comparable to a small modular reactor (SMR). He noted that Brazil had no reprocessing capabilities and no plans to develop them. In addition, a Specialized Maintenance Facility will be built at the Navy Shipyard and Submarine Base in Itaguaí. This facility, which is at an early stage of construction, will be equipped to refuel the submarines and store new and spent fuel elements.

Ambassador Câmara indicated that the governance of the programmes as well as the administration of its safeguards and nuclear safety and security would be a shared responsibility between Brazil's National Nuclear Energy Commission (CNEN) – soon to be transferred to the upcoming National Authority on Nuclear Security (ANSN) – and the Brazilian Navy's Naval Secretariat for Nuclear Safety and Quality (SecNSNQ).

On the topic of the Brazilian naval nuclear programme and Brazil's international non-proliferation obligations, Ambassador Câmara noted that Brazil has a constitutional norm that determines nuclear energy is to be used exclusively for peaceful purposes. Moreover, in terms of international commitments, Brazil is party to numerous international non-proliferation treaties including the Treaty on the Non-Proliferation of Nuclear Weapons; the Treaty of Tlatelolco, under which Latin America and the Caribbean was established as a nuclear-weapons-free zone; and the Quadripartite Agreement with Argentina, the IAEA and the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials (ABACC), whereby comprehensive multilateral and bilateral safeguards are applied to all nuclear material in its territory. He added that Brazil is also party to the Comprehensive Nuclear-Test-Ban Treaty (CTBT), a signatory state of the Treaty on the Prohibition of Nuclear Weapons (TPNW), and an active member of the Nuclear Suppliers Group (NSG), a key expert control arrangement. Moreover, Brazil is a founding member of the IAEA and has an impeccable track record on non-proliferation.

Ambassador Câmara underscored that the Brazilian naval nuclear programme was fully compatible with all of Brazil's international obligations. He noted that the NPT does not preclude any State, including NNWSs, from developing naval nuclear capabilities and noted that prior to the Quadripartite Agreement, Brazil and Argentina signed an agreement on the Exclusively Peaceful Use of Nuclear Energy (the so-called Guadalajara Agreement), in which they established a common system of accounting and control – managed by a bilateral agency, the ABACC. This agreement states that "none of the provisions of this agreement shall limit the right of the parties to use nuclear energy for the propulsion of any type of vehicle, including submarines, since propulsion is a peaceful application of nuclear energy".[4] Article 13 of the Quadripartite Agreement envisaged special procedures to be applied in cases where nuclear material that is required to be safeguarded is used "for nuclear propulsion or in the operation of any vehicle, including submarines and prototypes". This will enable both the IAEA and ABACC to fulfil their verification mandates under the Quadripartite Agreement.

In this regard, Ambassador Câmara indicated concern with the title of the side event: 'Strengthening the NPT Safeguards Regime for Naval Nuclear Propulsion Development'. He noted that this title inferred there was a need to strengthen the existing safeguards regime to address the issue of NNP.

4 Brazil and Argentina. *Acuerdo de Cooperación entre Brasil y Argentina para el Desarrollo y la Aplicación de los Usos Pacíficos de la Energía Nuclear*. Article III, 18 July 1991. **https://www.abacc.org.br/es/wp-content/uploads/sites/3/2016/10/Acordo-Bilateral-original-espanhol.pdf**.

However, this issue was already envisaged by both the model CSA[5] and the Quadripartite Agreement.[6] Both agreements established mechanisms for the development of technical procedures to ensure non-diversion of nuclear material to be used in NNP.

Ambassador Câmara concluded with some remarks on negotiations with the IAEA on special procedures pursuant to article 13 of the Quadripartite Agreement. He noted that in May 2022, Brazil submitted to the IAEA Secretariat its initial proposal for special procedures to be applied to the nuclear material used in NNP. The submission marked the start of consultations between Brazil, the IAEA and the ABACC focused on concluding an arrangement for the application of such special procedures. The special procedures will be a customized set of practices and verification measures that will give assurances of non-diversion of nuclear material for proscribed purposes.

He stated that the application of special procedures to the nuclear material employed in nuclear-propelled submarines will not affect the ability of both agencies – the IAEA and the ABACC – to reach their safeguards conclusions, while protecting sensitive technological and operational parameters related to the nuclear-powered submarine. The ABACC has played an important role throughout the negotiating process. Ambassador Câmara indicated that they had had four rounds of negotiations so far that were marked by a very constructive spirit. Member States of the IAEA will continue to be informed of the progress in these discussions through periodic reports by the IAEA Director General to the Board of Governors.

5 International Atomic Energy Agency. *The Structure and Content of Agreements Between the Agency and States Required in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons.* INFCIRC/153 (Corrected). 1972." **https://www.iaea.org/sites/default/files/publications/documents/infcircs/1972/infcirc153.pdf**.

6 See INFCIRC/435.

A Chinese perspective

H.E. Ambassador Shen Jian, Deputy Permanent Representative of the People's Republic of China to the United Nations Office at Geneva and other International Organizations in Switzerland. Ambassador Extraordinary and Plenipotentiary for Disarmament Affairs.

Ambassador Shen Jian focused his remarks on the implications of the AUKUS nuclear submarine cooperation for the nuclear non-proliferation regime. He noted there have been divergent views on this issue. Drawing from an earlier workshop in Vienna,[7] Ambassador Shen raised five clusters of issues related to AUKUS.

First, he stated that AUKUS cooperation on nuclear-powered submarines ran counter to the objective and purpose of the NPT and posed a serious risk of nuclear proliferation. The cooperation involves the transfer of naval nuclear propulsion reactors and weapon-grade highly enriched uranium (HEU) from two nuclear weapon States (NWS) to a NNWS. It was estimated that the nuclear fuel for eight nuclear submarines is about 1.6 to 2 tons of HEU at an enrichment level of 97.3%, an amount sufficient

7 For further details see China, *Nuclear submarine cooperation between the United States of America, the United Kingdom of Great Britain and Northern Ireland and Australia,* Working Paper, NPT/CONF.2026/PC.II/WP.36, Preparatory Committee for the 2026 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, 12 July 2024. https://documents.un.org/doc/undoc/gen/n24/207/80/pdf/n2420780.pdf

to make more than 60 nuclear weapons. This is why China had stressed that AUKUS nuclear submarine cooperation constituted a textbook case of nuclear proliferation. Moreover, he argued the invocation by Australia of an exemption from article 14 of the CSA would set an undesirable precedent and lead to a new arrangement whereby NNWSs could fulfil their safeguards obligations in such a manner that only a part of their nuclear activities would be subject to the IAEA safeguards and a large amount of HEU would remain outside safeguards arrangements. Ambassador Shen stated that this would open a Pandora's box which may encourage other countries to follow suit and would have a far-reaching negative impact on regional nuclear issues.

Second, Ambassador Shen stated that the three members of the AUKUS and the IAEA Secretariat have no right to interpret article 14 of the CSA and the issue of its application by themselves without any authorization from the IAEA Member States. It was noted that whilst article 14 touched upon the non-application of safeguards to nuclear material to be used in non-peaceful activities/non-proscribed military activity, the international community was still far from consensus on the definition of non-peaceful activities and non-proscribed military activity, as well as on the scope and procedures for such non-application. Ambassador Shen suggested the ongoing discussions taking place in the NPT Preparatory Committees and in Vienna, indicated there are substantial divergences on issues related to the application of article 14. Given the historical practice of strengthening the safeguards regime by the IAEA, China believed that such issues should be discussed by all interested Member States through an intergovernmental process to build consensus.

Ambassador Shen recalled that in 1978, the then-Director General of the IAEA made it very clear in his correspondence with Australia that the Board of Governors had yet to take opportunities to interpret article 14 and relevant procedures because no NPT States Parties had sought to apply this clause. In addition, it was the IAEA Secretariat's view that any arrangements under article 14, or any notification received by the Secretariat under this article, "must be reported to the Board of Governors, and it would be for the Board in each case to take the appropriate action". As such, he argued that the IAEA Secretariat has no authority to interpret article 14 and its application; instead, Member States should provide guidance to the IAEA on such cooperation.

Third, he argued that the article 14 safeguards arrangement cannot ensure that the nuclear material transferred to Australia will not be diverted to the production of nuclear weapons. According to article 14, the IAEA shall be kept informed of the total quantity and composition of such nuclear materials but shall not have any knowledge of military confidential information. Ambassador Shen contended that this meant the AUKUS programme would not be under the same level of safeguarding as it would in a CSA, yet alone the AP. Under such circumstances, China does not believe Australia and the IAEA Secretariat can arrive at reliable and credible safeguards arrangements. Furthermore, the IAEA cannot implement measures to effectively supervise nuclear material inside the NNP device and therefore avoid the risks of nuclear proliferation.

Fourth, Ambassador Shen contended that by setting-up the so-called AUKUS, the three members of this new military alliance were inciting military confrontation through military cooperation. This, it was argued, reflected a typical Cold War mentality. Apart from increasing the risks of nuclear proliferation, it also exacerbated arms racing in the Asia-Pacific and undermined peace and security in the region.

In turn, he suggested, it would be detrimental to international efforts to promote disarmament and non-proliferation.

Fifth, Ambassador Shen emphasized the importance of the distinction between different naval nuclear propulsion programmes, arguing some parties had intentionally bundled the Brazilian submarine programme with the AUKUS nuclear submarine programme. However, as illustrated in the remarks of the previous speaker, there were important elements that distinguish the Brazilian programme from AUKUS. First, the Brazilian programme does not involve HEU. Second, the Brazilian programme directly involves the participation of the ABACC, which demonstrates the good faith consultations with other stakeholders. And third, the Brazilian programme is an indigenous programme and therefore does not trigger concerns regarding nuclear transfer from NWSs to NNWSs.

In concluding, Ambassador Shen stated that the AUKUS presented many issues to be addressed, not only by the IAEA, its Member States, and the Board of Governors, but also in the context of safeguarding the authority and effectiveness of the NPT. He argued the ongoing NPT review cycle cannot ignore this issue and in-depth discussion on AUKUS was a necessary part of this process. Meanwhile, the IAEA Secretariat and its Member States should continue to promote intergovernmental processes in an open, inclusive, transparent, and sustainable way in accordance with its mandate, in order to improve and strengthen the IAEA safeguards system and uphold international nuclear non-proliferation regime.

A perspective from the IAEA

Ms. Meena Singelee, Head of the IAEA Liaison Office in Geneva.

Ms. Singelee began with some background information on the IAEA, indicating the Agency is an intergovernmental organization established by the Statute (art. I). She noted that 178 States are parties to the Statute and they have the authority to interpret its provisions, objectives (art. II), functions (art. III), roles of programme Management Officer (art. V and VI), Director General and the Secretariat (art. VII). The safeguards or control function of the Agency set out in art. III.A.5 of the Statute is different than the "assistance" function which is addressed in art. III.A.1-4, 7, and art. IX-XI.

She indicated that art. III.A.5 authorizes the Agency to establish and administer safeguards designed to ensure that assistance made available by the Agency is not used in such a way as to further any military purpose; this applies to project and supply agreements approved by the Board of Governors involving Agency assistance (art. XI – Agency Projects). In addition, art. III.A.5 authorizes the Agency to apply safeguards, at the request of the parties, to any bilateral or multilateral arrangement (e.g. in connection with the NPT or Nuclear Weapons Free Zones treaties) or at the request of a State, to any of that State's activities in the field of atomic energy.

Ms. Singelee noted that the Board has the authority to carry out the functions of the Agency, including safeguards (art. VI.F.). This has been confirmed by subsequent Board practice. The Board has authorized the Director General to sign and implement all safeguards agreements (item-specific, comprehensive safeguards agreements, and voluntary offer safeguards agreements), that are now in force for 190 States. Since 1959, all safeguards documents (e.g. Inspector Document, first safeguards

system (INFCIRC/26) and its subsequent revisions (INFCIRC/66, Rev. 1 and 2), INFCIRC/153, INFCIRC/540 and Safeguards Confidentiality Regime (1997)) were developed by the Member States in the framework of the Board – or its Safeguards Committees and approved by the Board.

Regarding CSAs, she indicated that the document contained in INFCIRC/153 was negotiated by Member States in the framework of Committee 22 established by the Board in 1970 after the entry into force of the NPT, and it was approved by the Board in 1971. The Board authorized the Director General to use this document as the basis for negotiating CSAs in connection with the NPT, and it has been doing so since 1971 without change. CSAs concluded on the basis of INFCIRC/153 are currently in force for 182 NNWS parties to the NPT.

Ms. Singelee stated that the safeguards provisions in the Statute are not self-executing; the Agency applies safeguards on the basis of the safeguards agreements in force with States, and regional organizations. For States with CSAs in force, the Agency applies safeguards on the basis of their respective CSA concluded with the Agency pursuant to the authority provided for in art. III.A.5 of the Statute, i.e. "to apply safeguards, at the request of the parties to any bilateral or multilateral arrangement". The safeguards agreements set out the States undertakings, rights and obligations of the parties and the relevant safeguards procedures to be applied.

The issue of compatibility of safeguards agreements, including CSAs based on INFCIRC/153, and the Agency's Statute as regards the statutory legitimacy of non-explosive military applications of nuclear material subject to the Agency's safeguards system was considered by the Board in early 1980s. The study carried out at that time by the Director General concluded that this statutory requirement is met under all types of safeguards agreements, including INFCIRC/153-type agreements. The Board took note of this study.

Ms. Singelee indicated that the State's undertaking in art. 1 of the CSA is to accept safeguards on all nuclear material in "all peaceful nuclear activities within its territory, under its jurisdiction or carried out under its control anywhere". This is in accordance with art. III.1 of the NPT. The Agency has the right and obligation to apply safeguards, in accordance with the provisions of the CSA, on all such material to verify that it is not diverted to nuclear weapons or other nuclear explosive devices.

The use of nuclear material required to be safeguarded under a CSA, whether produced domestically or imported, for nuclear-powered submarines was envisaged by Member States during the negotiations of Committee 22. It was agreed and reflected in paragraph 14 of INFCIRC/153 and included subsequently in the CSAs approved by the Board. Therefore, this is part of the legal framework, i.e. CSAs concluded on the basis of INFCIRC/153 which the Board has authorized the Director General to sign and implement. This function entrusted to the Director General by the Board has been implemented in accordance with the safeguards agreements and under the authority of the Board.

There is no mechanism in the CSA providing for automatic exclusion from safeguards of nuclear material "required to be safeguarded" under the CSA. This has to be done through the arrangement provided for in art. 14 of the CSA. Regarding the relevant reporting procedures of nuclear material, the nuclear material produced domestically or imported has to be reported to the Agency as provided for

in art. 34 (c) and 91-95. The definition of "inventory change" in the CSA also refers to receipts from a non-safeguarded (non-peaceful) activity and shipment for a non-safeguarded (non-peaceful) activity; none of these provisions have an exclusion for nuclear material used in naval nuclear propulsion or transferred for a non-proscribed military activity in a CSA State. Such advance notification enables the Agency to plan its activities under the CSA, prior to the time when the arrangement in art. 14 becomes effective.

Article 14 of the CSA allows the State to use nuclear material which is required to be safeguarded under the CSA in a nuclear activity, such as nuclear propulsion for submarines, provided that the State makes an arrangement with the Agency in this regard.

Under art. 5 of the CSA, the Agency has the obligation to protect confidential information coming to its knowledge in the implementation of the CSA. The Agency cannot publish or communicate to any State, organization or person any information obtained by it in connection with the implementation of the CSA, including with respect to information received from a State in relation to an art. 14 arrangement, except that specific information relating to such implementation in the State may be given to the Board and to such Agency staff members as required such knowledge by reason of their official duties in connection with safeguards, but only to the extent necessary for the Agency to fulfil its responsibilities in implementing the CSA.

Since September 2021, the Director General addressed the matter in his statements to the Board and also in the Safeguards Implementation Report and specific reports to the Board. In this context, the Director General pointed out, inter alia, that:

- The legal obligations of the parties and the non-proliferation aspects are paramount; the Agency's role in this process is foreseen in the existing legal framework and falls strictly within its statutory competences;
- The Agency will continue to have its verification and non-proliferation mandate as its core guiding principle and it will exercise it in an impartial, objective and technical manner;
- The technical discussions initiated with two States with CSAs in force which notified the Agency of their decisions to acquire NNP would need to address all aspects related to the application of safeguards to nuclear material and related facilities prior to and after the required arrangements would become effective, as well as the elements to be included in such arrangement; the Agency will consider in addition, which provisions of the AP would be applicable, as well as any transparency measures that might be offered in this regard;
- During this process, the Agency will act in strict accordance with the letter and spirit of the legal framework (CSA, AP and the Statute) and keep the Board informed at all stages of our consultations.

The legal aspects to be discussed concern paragraph 14 of INFCIRC/153 as a whole and will include:

- The State party's commitment that the use of the nuclear material in a non-proscribed military activity will not be in conflict with an undertaking the State may have given, and in respect of which Agency safeguards apply (e.g. an item-specific safeguards agreement or a project and supply agreement), that the nuclear material will be used only in a peaceful nuclear activity;

- Duration of the arrangement;
- Reporting arrangements, which do not involve any approval or classified knowledge of the military activity or relate to the use of nuclear material therein.

The IAEA representative indicated that on the issue of interpretation of the CSA provisions, the Director General clarified during the Board meeting in June 2023 that there are specific provisions on the interpretation and application of the CSA in articles that correspond to paragraphs 20 and 21 of INFCIRC/153. Paragraph 20 provides that the State party to the CSA and the Agency "shall, at the request of either, consult about any question arising out of the interpretation or application of [the CSA]", including paragraph 14. Pursuant to paragraph 21, the State party to the CSA has the right to request that "any question arising out of the interpretation or application of [its CSA] be considered by the Board". So interpretation where it is a matter between the State party concerned and the Secretariat, this is according to the existing legal framework.

The Director General also informed the Board on several occasions that he will ensure a transparent process that will be solely guided by the Agency's statutory mandate and the relevant safeguards agreements, and he will continue to keep the Board of Governors and Member States informed of this work and to transmit the arrangement when finalized to the Board of Governors for appropriate action.

A perspective from UNIDIR

Dr. Pavel Podvig, Senior Researcher, UNIDIR.

Dr. Pavel Podvig provided a factual overview of existing naval nuclear propulsion programmes. Currently, there are seven States with military naval nuclear propulsion programmes, these are the United States, the Russian Federation, the United Kingdom, France, People's Republic of China, India, and Brazil (in development). These programmes are indigenous in nature.

Dr. Podvig indicated that in addition to naval reactors, all NNP programmes include other components, such as land-based prototype reactors, fuel fabrication facilities, and a system that manages spent fuel of naval reactors. The military applications of NNP are diverse. For instance, the US and France utilize this technology in aircraft carriers, while Russia employs it in cruisers and specialized submarines.

Bilateral cooperation and transfer of materials are precedented practices in NNP. Dr. Podvig recalled the example of India leasing a nuclear-powered submarine from the Soviet Union (1988-1991) and from Russia (2012-2021). The US and the UK have a close partnership that includes cooperation for reactor technology and the supply of HEU for UK submarines.

Furthermore, NNP also has applications in civilian programmes. For example, Russia has nuclear powered icebreakers, a container ship, and a floating nuclear power plant. Previous projects carried out by the US, Germany, and Japan in the 1960s and 1970s attempted to build nuclear-powered cargo

ships, albeit with limited success. Dr. Podvig also noted that some civilian programmes develop small modular reactors. Increasingly popular, these reactors may also present safeguards challenges similar to those associated with naval reactors.

On the production of fissile material for NNP, Dr. Podvig provided an overview of the different levels of enrichment. The US and the UK use weapon-grade HEU normally enriched to at least 93% of Uranium-235. Russia also uses HEU but in a lower grade, varying enrichment between 21-90%. India is believed to be using HEU enriched up to 30%. Meanwhile, France, China, and Brazil use low enriched uranium (LEU), probably with enrichment as low as 5%. Most States produce their own fissile material for naval propulsion. For LEU, the civilian infrastructure can be utilized. However, in the case of the US, the current source of HEU for both US and UK reactors is the US reserve of the material. The UK receives HEU for its reactors as part of the US-UK cooperation agreement. The US had a reserve of about 90 tonnes in 2023, with a consumption rate of less than 3 tonnes a year.

Dr. Podvig noted that reactors require refuelling, however there are different intervals depending on the fissile material used. For example, the refuelling intervals are around 4 years for US aircraft carriers and for Russian icebreakers. For most Russian submarines, the intervals are between 6-8 years, while for most French submarines it is close to 10 years. For most US and UK submarines, mid-life refuelling is required at the interval of 17-22 years. And for new submarines with HEU fuel, life-time cores are up to 40 years.

In concluding, Dr. Podvig remarked on the measures necessary to deal with spent fuel. Once fuel is irradiated, it needs disposal. Irradiated material cannot be used directly in any application, it requires chemical separation from fission products. The uranium in spent fuel has lower enrichment than that in fresh fuel. In those cases when the initial enrichment is low, the irradiated material may no longer be considered HEU (which would be the case with initial enrichment of 21%). However, if the initial enrichment is about 90%, the material in irradiated fuel would still be HEU. Regardless of enrichment levels, both HEU and LEU in spent fuel are classified as “special fissionable material” according to the IAEA Statute. Regarding reprocessing, Russia is currently the only country actively engaged in this practice and intends to continue doing so. Many countries opt for storing spent fuel, while some countries, such as France, have the capability to reprocess it.

Discussion

In the ensuing discussion, panellists exchanged views on several aspects of NNP-related issues, including the **IAEA's experience** with developing a safeguards approach to NNP. On this topic, it was indicated that the Agency has experience safeguarding various reactors, including research reactors and some naval reactors. Additionally, it was noted that there is a precedent for the development of article 14 arrangements, including in Canada, in 1988, followed by Brazil, and now Australia. One panellist cautioned against attempts to politicize or interfere with bilateral engagements on NNP with the IAEA, suggesting this would risk undermining the IAEA's independent, technical mandate for safeguards implementation. Adding that this is not in anyone's interest.

Participants also discussed **confidentiality within the IAEA** and, more specifically, the position of the Board of Governors on providing information on the NNP programmes of Australia and Brazil. One panellist indicated that confidentiality is one of the key issues when it comes to NNP. A second panellist indicated that the confidentiality obligations are included in safeguards agreements and the sharing of information more widely is voluntary, and it was up to the States to consider. It was noted that the IAEA Director General has addressed the issue of NNP in his remarks to the Board of Governors, the Board continues to be kept informed and once the arrangements have been finalized, they will be transmitted to the Board as well.

A third theme in the discussion related to **additional transparency measures** that would allow the countries developing NNP to demonstrate that they are implementing their safeguards obligations. On this point, one panellist noted differences in confidentiality requirements between programmes that are indigenous and those programmes that, like AUKUS, involve transfers between NWSs and NNWSs.

It was remarked that dealing with the latter issue was particularly challenging. The panellist further remarked that with new and novel issues related to the implementation of article 14, there should be a bigger role for Member States in developing, considering, and approving relevant procedures and arrangements. A second panellist suggested that Australia and the IAEA have been in consultations to find ways to facilitate verification and monitoring. Moreover, consistent with its CSA and AP, Australia declares all nuclear materials to the IAEA. It was argued that Australia has been engaged in demonstrating that its NNP programme is possible and consistent with article 14 and that the IAEA can reach its objectives. A third panellist noted that the Brazilian naval reactor under development is almost or identical to the type of nuclear naval propulsion used by icebreakers; adding that a special procedure had been established to protect sensitive information, which is necessary for the operationalization of NNP submarines.

Participants also discussed the **safety and security of nuclear materials.** It was noted that each State had the responsibility to provide for the security of nuclear material and their associated facilities and activities. Participants queried what measures Brazil and Australia might take to ensure the security of nuclear materials employed in their respective NNP projects. It was noted that Brazil holds the highest security standards, something reflected in Brazil's membership in the Convention on the Physical Protection of Nuclear Material (CPPNM), participation in the International Conference on Nuclear Security (ICON) in Vienna, and the establishment of the National Nuclear Energy Commission (CNEN) under the office of the president. Australia was committed to the highest standard of safety and security, protecting against theft, sabotage, and unauthorized access, and had demonstrated leadership and commitment in this area. Indeed, the panellist noted that Australia is the best performer of the international community on the Nuclear Security Index and the NNP project will also meet these high standards. It was remarked that participants should be reassured that the US and the UK have a 60-year record of no submarine reactor accident and no release on radioactivity that has harmed human health or the environment.

Closing remarks from Indonesia

Summary of remarks by H.E. Achsanul Habib, Deputy Permanent Representative of the Republic of Indonesia to the United Nations and other International Organizations in Geneva.

At the end of the event, H.E. Achsanul Habib provided some closing remarks. These remarks focused on three key points.

First, on transparency and cooperation, Ambassador Habib indicated that as we move forward, it would be crucial to remain steadfast in our commitment to transparency, cooperation, and mutual respect. He noted that Indonesia's decision to convene this side event underscored their belief in the merit of open and inclusive dialogue on naval nuclear propulsion development. He welcomed the contributions from the esteemed panellists and the audience, suggesting these contributions enriched our understanding and provided valuable perspectives.

Second, Ambassador Habib stressed the importance of dialogue within the NPT process. He noted that discussions during the event highlighted the significance of continued transparent and open dialogue on NNP development. Such discussion in the NPT process complements the deliberations in the IAEA in Vienna and can help strengthen the safeguard and non-proliferation regime and ensure its adaptability in responding to emerging issues, such as NNP.

Finally, Ambassador Habib outlined Indonesia's role and the path forward, expressing his belief that States have a collective obligation to come up with initiatives that bridge differences and foster mutual understanding. Through the panel discussion and the gathering momentum, he hoped it would be possible to set a positive tone for further conversation and build on the insights gained, continuing to foster open dialogue and striving towards a safer, more peaceful world.

Ambassador Habib concluded by expressing his deepest appreciation to the esteemed panellists for accepting Indonesia's invitation to speak at this side event, as well as to the UNIDIR team and the active participation and contributions from the audience.

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