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# THE AUKUS SUBMARINE DEAL: RISKS FOR THE NUCLEAR NONPROLIFERATION REGIME AND GLOBAL SECURITY

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## List of abbreviations

<b>ANZUS</b>	Australia, New Zealand and United States Security Treaty
<b>AUKUS</b>	Trilateral security alliance between Australia, the United Kingdom, and the United States
<b>BoG</b>	Board of Governors (IAEA)
<b>CACDA</b>	China Arms Control and Disarmament Association
<b>CENESS</b>	Center for Energy and Security Studies
<b>CINIS</b>	China Institute of Nuclear Industry Strategy
<b>CPS</b>	Conventional Prompt Strike program
<b>CSA</b>	Comprehensive safeguards agreement
<b>GC</b>	General Conference (IAEA)
<b>ENNPIA</b>	Exchange of Naval Nuclear Propulsion Information Agreement (between Australia, the UK and US)
<b>HEU</b>	Highly enriched uranium
<b>IAEA</b>	International Atomic Energy Agency
<b>ICBM</b>	Intercontinental ballistic missile
<b>INF Treaty</b>	Intermediate-Range Nuclear Forces Treaty
<b>INFCIRC</b>	Information Circular
<b>JASSM</b>	Joint Air-to-Surface Standoff Missile
<b>LRASM</b>	Long Range Anti-Ship Missile
<b>NATO</b>	North Atlantic Treaty Organization
<b>NC3</b>	Nuclear Command, Control, and Communications system
<b>NNWS</b>	Non-nuclear weapon state
<b>NPT</b>	Treaty on the Non-Proliferation of Nuclear Weapons
<b>NSG</b>	Nuclear Suppliers Group
<b>NWS</b>	Nuclear-weapon state
<b>ROK</b>	Republic of Korea (South Korea)
<b>SIR</b>	Safeguards Implementation Report
<b>SLA</b>	State-level approach
<b>SLBM</b>	Submarine-launched ballistic missile
<b>SLCM</b>	Submarine-launched cruise missile
<b>SNOWCAT</b>	Support of Nuclear Operations with Conventional Air Tactics program (NATO)
<b>SSN</b>	Nuclear-powered submarine
<b>UNSC</b>	United Nations Security Council
<b>VPM</b>	Virginia Payload Module
<b>VPT</b>	Virginia Payload Tube

## I. Executive Summary

In September 2021 the three states – Australia, the United Kingdom, and the United States – announced the creation of “AUKUS”, “an enhanced trilateral security partnership”. The first initiative under the AUKUS deal entails the support of two nuclear-weapon states (NWS) in establishing fleet of 8 nuclear-powered submarines (SSNs) for Australia, a non-nuclear weapon state (NNWS) party to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT). Among other things, the deal envisages the transfer to Australia of the nuclear fuel for the submarine propulsion systems, totaling up to four tons of highly enriched uranium (HEU) at enrichment level of 93–97% U-235. That amount of HEU would theoretically be enough to produce 160 nuclear explosive devices. The AUKUS strategic military cooperation is unprecedented and goes against the goals and spirit of the NPT, may inflict severe damage on the international non-proliferation regime and the NPT itself. It has raised serious concerns and triggered a controversy among international community.

China Arms Control and Disarmament Association (CACDA) and Center for Energy and Security Studies (CENESS) agreed to undertake a joint study on the AUKUS nuclear submarine deal. The conducted study identifies the main risks and challenges the AUKUS nuclear submarine deal creates for the non-proliferation regime, and IAEA safeguards system. The study outlines possible implications for global and regional security, as well as it offers some recommendations with an aim of reducing associated risks and challenges.

### ***Risks and Challenges to the Nuclear Non-proliferation Regime***

AUKUS nuclear submarine cooperation exploits an important lacuna of the non-proliferation regime and reduces political and moral barriers to nuclear proliferation. The IAEA safeguards system, as an indispensable mechanism for the implementation of the NPT and a verification measure for the prevention of the spread of nuclear weapons, also encounter challenges. Possible attempts of behind-the-scenes discussions between the parties to AUKUS and the IAEA

Secretariat can lead to the politicisation of the Secretariat and erode the over-all trust in the IAEA.

The AUKUS carries risks for and undermines the spirit of the South Pacific Nuclear Free Zone Treaty (Treaty of Rarotonga). Among other factors, it seems that the current trend to minimize the use of HEU globally is no longer relevant. In that context, the transfer of significant amounts of HEU creates double standards for the NNWS. Last, but not least: other non-proliferation regimes, such as the Missile Technology Control System (MTCR), one of whose objectives was to stop proliferation of potential means of delivery of nuclear weapons, may be affected; since the Tomahawk cruise missiles, which will be provided to Australia under the deal, have a range far exceeding the maximum limit established of the MTCR.

### ***Challenges to IAEA Safeguards System***

There are profound issues as to whether the weapons-grade HEU which will be transferred to Australia under the deal will be under any form of safeguards or monitoring by the IAEA. Article 14 of Australia's Comprehensive Safeguards Agreement (CSA), which provides for non-application of safeguards to nuclear material in non-proscribed military activity, is not sufficient to solve the problem. This Article has never been invoked before and no NWS has ever supplied tons of HEU to a NNWS. Therefore, pro-forma invoking Article 14 would only fuel suspicions; elaboration of additional measures may help, but such measures cannot be identified in closed talks between the IAEA Secretariat and AUKUS partners – serious and full involvement of the IAEA Board of Governors (BoG) is required.

### ***Other Nuclear Risks Associated with the Initiative***

What also requires special attention is the safety of nuclear materials in the context of AUKUS nuclear submarine deal. In March 2023 the United Kingdom and the United States indicated that they intend to provide Australia with nuclear material “in complete, welded power units” meaning that the nuclear fuel will already be inside the reactor when transported to Australia. Several factors

should be taken into consideration, including potential external impacts during transportation (risk of sinking, etc.). To this date, there has been no specific information provided about the nuclear safety and security dimension of the project by the parties involved in the AUKUS nuclear submarine deal.

### ***Implications for Regional and Global Security***

In a wider security and doctrinal framework, the AUKUS deal is considered to be rooted in a US model of “Great Power Competition”, that can eventually lead to stimulation of the interest in some NNWS in nuclear weapons options. On a larger scale, the AUKUS deal brings new uncertainties to regional and global security. Several crucial developments are noteworthy in this regard. First is the development of the arms race dynamics and possible nuclear submarine arms race: the AUKUS nuclear submarine deal will prompt other countries to reconsider their submarine ambitions, unleashing new nuclear proliferation momentum among NNWS that pursue nuclear-powered submarines or have expressed similar intentions. Second, non-nuclear long-range precision strike capability, being provided to Australia, will affect nuclear deterrence and strategic stability. While current non-nuclear strategic weapons cannot carry out all the missions assigned to nuclear weapons those still can produce strategic effects.

### ***Conclusion and Recommendations***

The controversies around AUKUS have highlighted the need for making the nuclear non-proliferation regime more resilient to these and possible future similar challenges. It is in the best interest of all States to collectively address the challenges and risks and root for collectively found solutions. In this sense, several recommendations are provided.

States need to take certain steps to uphold the international nuclear non-proliferation regime, specifically to address risks of the AUKUS nuclear submarine deal through open and inclusive dialogues and cooperation. That should include a range of activities aimed at increasing transparency and



predictability, ensuring the safety of nuclear material and technology, and establishing trust and confidence.

In this sense, the transition from AUKUS partners statements to their actions is necessary to ensure and apply transparent approach in regard to substantial technical, policy or legal aspects of concluding an arrangement under Article 14 and other aspects of the deal.

It is the Member States of the Agency and its governing bodies, including the IAEA Board of Governors, that should be involved in ensuring a reliable and effective arrangement in favor of the NPT and non-proliferation regime. The IAEA Member States and Board of Governors should take part in the development of arrangements on conceptual issues related to safeguards, and such arrangements should be submitted to the Board of Governors for approval. Different types of forums and processes can be considered, such as the establishment of a Special Committee open to all IAEA Member States or of a special expert group.

The Member States and the IAEA Secretariat should also bear in mind nuclear safety and security issues emerging from transportation of the nuclear material in complete, welded power units to Australia.

The AUKUS deal poses serious risks for the nuclear non-proliferation regime and geopolitical environment as a whole, should be further studied and stay in focus of international expert community, research centers and think-tanks. Academic community can also offer new solutions to the issues resulting from the AUKUS cooperation and identify the new ones through conducting regular inclusive discussions.

## II. Introduction

In September 2021, Australia, the United Kingdom, and the United States announced the creation of “an enhanced trilateral security partnership” called “AUKUS” and its first initiative to assist Canberra in acquiring nuclear-powered submarines for the Royal Australian Navy. The AUKUS pact, which was prepared in secrecy, came as a surprise to many. Under AUKUS the United States and the United Kingdom, being NWS, embarked on nuclear submarine cooperation with Australia, a NNWS and their military ally, involving transfer of some four tons of weapons-grade HEU (93-97%) in the form of nuclear fuel<sup>1</sup>. This project poses severe risks to the nuclear non-proliferation regime and wider international security. It also raises many questions and concerns in several dimensions, including about technological, legal, and geo-strategic aspects and consequences of the deal. All aspects require an in-depth unbiased study from the political analyst community, including scientists, experts on international relations and security, and, more specifically, non-proliferation issues, including the IAEA safeguards and export control mechanisms.

While the creation of AUKUS is seen by many as a way to reinvigorate America’s network of alliances and partnerships to uphold the US’ Indo-Pacific strategy, some go further. They consider AUKUS to be an incarnation of a new model of “Great Power Competition”, pursued by Washington, which envisages stimulation, encouragement and empowerment of hostile actions against major American rivals by at least some of the latter’s neighbors, while avoiding direct military conflict between the US and its perceived main rivals. Such a model includes provision of weapons systems that would allow such neighbors to militarily engage strategic targets and perform strategic, including counterforce, missions even without using nuclear weapons. Practical implementation of such a model often deprioritizes the values of the non-proliferation regime in favor of perceived short-term and mid-term strategic interests. This significantly undermines confidence in the nuclear non-proliferation regime in the NNWS and NWS alike. Together with a lack of transparency of AUKUS projects or

functioning dialogue between the three States and States concerned this reinforces the risks of instability in the geopolitical environment.

The AUKUS alliance's "first initiative" on transferring nuclear-powered submarines to Australia with the subsequent building at the future submarine construction yard in Adelaide of the SSN is setting a precedent for the IAEA Safeguards System. Whereas Article 14 of the Comprehensive Safeguards Agreement (CSA) provides for non-application of safeguards on nuclear material in a non-proscribed military activity, no states prior to Australia had ever invoked it. The Agency's lack of experience in applying Article 14 creates the need for an open and inclusive discussion on the development of appropriate and effective approaches to its implementation. At the same time, the parties to the AUKUS deal have not disclosed sufficient details concerning the envisaged arrangement, necessary between the Agency and the State under Article 14 (b) nor do they support the discussions on this topic in the relevant policy-making bodies of the IAEA.

Russia and China have both made statements to the effect that the development of any implementation concept, when it comes to safeguards, should be driven by Member States, and that such implementation concept shall be approved by consensus by the IAEA Board of Governors.

In this context, the China Arms Control and Disarmament Association (CACDA) and the Center for Energy and Security Studies (CENESS) agreed to prepare a joint study on the risks and challenges the AUKUS nuclear submarine deal creates for the nuclear non-proliferation regime, and IAEA safeguards system, and on ways to address them. It also outlines trilateral strategic military cooperation possible implications for global and regional security.

The work on the joint study started in March 2023 and was completed in July 2023. Significant assistance in the preparation of the study was provided by working groups created with the participation of Chinese and Russian experts, coordinated by CACDA, and CENESS, respectively. The China Institute of Nuclear Industry Strategy (CINIS, which is also named China Nuclear Think

Tank) provided significant support to the study. The working groups included former diplomats, nuclear and safeguards specialists, and scientists. All experts listed in Annexes 1 and 2, participated in discussions as part of the preparation of the study in their personal capacity. At the same time, the report does not necessarily reflect fully the views of all the participants of the study, or the organizations with which they are associated. Nor does it attempt to offer final solutions to the problems, caused by the AUKUS and its nuclear submarine deal. Rather, it suggests the road to follow in order to better understand non-proliferation risks involved and minimize them, while taking into account legitimate concerns of various countries.

CACDA, and CENESS hope that the report will serve as a catalyst for further discussions by international experts and officials and will contribute to open discussions at the Board of Governors and General Conference of the IAEA, NPT Review Conference and in other relevant institutions, in order to support international efforts to develop measures to meet the current challenges and to reduce the risks to the non-proliferation regime, resulting from the AUKUS deal, and preserve the global security.

### **III. AUKUS and Nuclear Submarine Deal**

The declared objective of AUKUS is to deepen cooperation of its parties on security and defense capabilities and foster deeper integration of security and defense-related science, technology, industrial bases, and supply chains, information and technology sharing.<sup>2</sup> Three countries will also collaborate to enhance their joint capabilities and interoperability with initial efforts focus on cyber capabilities, artificial intelligence, quantum technologies, and additional undersea capabilities. As the first initiative of the AUKUS alliance, the UK and the US will assist Australia in acquiring nuclear-powered submarines (SSNs) for the Royal Australian Navy.

In this context, on 22 November 2021, Australia signed the Exchange of Naval Nuclear Propulsion Information Agreement (ENNPIA)<sup>3</sup> with the UK and the US. ENNPIA enabled two Nuclear-Weapon-States (NWS) to exchange sensitive and classified naval nuclear propulsion information with Australia. ENNPIA creates a legal basis for parties to communicate and exchange information in order “to research, develop, design, manufacture, operate, regulate, and dispose of military reactors, and provide support to facilitate such communication or exchange”.

On 13 March 2023 Australian Prime Minister Anthony Albanese, UK Prime Minister Rishi Sunak, and U.S. President Joseph Biden unveiled their plan<sup>4</sup> to assist Australia in acquiring SSNs based on a phase approach. It includes several crucial elements:

- To increase US and UK port visits of SSNs to Australia beginning in 2023 and 2026 respectively.
- To accelerate the development of the Australian naval personnel, workforce, infrastructure and regulatory system necessary to establish a sovereign SSN capability through working on UK and US SSNs and in UK and US facilities.<sup>5</sup>
- To establish ‘Submarine Rotational Force-West’ (SRF-West) initiative in 2027: a rotational presence of up to four U.S. Virginia and one UK Astute class submarines at HMAS Stirling near Perth, Western Australia.<sup>6</sup>

- To supply Australia with three U.S. Virginia-class submarines starting in the early 2030s with a possibility to sell up to two more if needed.
- To deliver the first SSNs-AUKUS – a trilaterally-developed submarines based on the British next generation design, and incorporating cutting-edge Australian, UK, and U.S. technologies – to the Royal Navy by the UK in the late 2030s.
- To deliver the first Australian-built SSN-AUKUS to the Royal Australian Navy in the early 2040s.

*Table 1. Australia’s Acquisition of the SSNs in the Context of AUKUS Deal<sup>7</sup>*

<b>Type of Submarines</b>	<b>Quantity<sup>8</sup></b>	<b>Delivery</b>	<b>Supplier</b>
U.S. Virginia	3-5	early 2030s	the US
SSN-AUKUS	5-3 <sup>9</sup>	early 2040s	Australia*

\*Australia will build SSN-AUKUS with the use of UK submarine design and advanced US technology

In practical terms, the US and UK will assist Australia in establishing fleet of 8 nuclear-powered submarines<sup>10</sup> in total. According to the information available, each U.S. Virginia-class submarine and UK Astute-class submarine<sup>11</sup> contains about 500kg of highly enriched uranium (HEU) at weapons-grade enrichment 93–97% U-235 (precise quantity and isotopic composition of HEU fuel and fabrication information remain highly classified). That means the nuclear fuel of Australia submarines will contain about 4 tons of HEU enough to produce 160 nuclear explosive devices.<sup>12</sup>

On 14 March 2023 the Director General of the IAEA Rafael Grossi received a letter<sup>13</sup> from Australian Minister for Foreign Affairs Penny Wong, in which Australia expressed an intention to commence negotiations with the IAEA of an arrangement pursuant to Article 14 of Australia’s Comprehensive Safeguards Agreement (CSA). Article 14 allows an exemption from IAEA safeguards with respect to nuclear material used in the non-prescribed military activity.

According to the documents released, Australia will manage all radioactive waste and spent fuel, generated through operation of Virginia-class and SSN-AUKUS submarines. Radioactive waste will be stored on “Defence sites” in

Australia. The United Kingdom and the United States will assist Australia in developing this capability. The nuclear reactors that will power the SSN-AUKUS will arrive from either the UK or US in a welded power unit and will not require refuelling during their expected lifetime. The official estimate is that only for Australian budget by the early 2050s the overall cost of the nuclear-powered submarines program under the AUKUS pact will increase 367 billion Australian dollars.<sup>14</sup>

In the course of events, in August 2022 the three states submitted a Working paper to the Tenth NPT Review Conference, stating that they would promote nuclear submarine cooperation “with the highest possible non-proliferation standards”, maximizing the international transparency and maintaining close engagement with the IAEA.<sup>15</sup>

Despite reassurance the AUKUS parties tried to provide, a number of states have expressed their disquiet regarding the AUKUS alliance and its initiatives in their national statements to the Tenth NPT Review Conference, IAEA 66th General Conference and meetings of the Board of Governors of IAEA. In particular, China<sup>16</sup>, Malaysia<sup>17</sup>, Philippines<sup>18</sup>, and Russia<sup>19</sup> stated that AUKUS alliance can have a negative impact on peace and stability of the Indo-Pacific region. Their arguments included concerns about the further militarization of the Pacific and Indian oceans, prompting of an arm race, and the lack of transparency and functioning dialogue mechanisms. Austria<sup>20</sup>, China<sup>21</sup>, Egypt<sup>22</sup>, Iran<sup>23</sup>, Russia<sup>24</sup>, South Africa<sup>25</sup>, and Switzerland<sup>26</sup> are concerned that assistance to Australia in acquiring of SSNs under AUKUS creates new risks and challenges to the non-proliferation regime. The role of IAEA Board of Governors and IAEA Member States in developing an Arrangement under Article 14 of Australia’s CSA is also a matter of concern for many states, including China<sup>27</sup>, Indonesia<sup>28</sup>, Philippines<sup>29</sup>, Russia<sup>30</sup>, South Africa<sup>31</sup>, and Switzerland<sup>32</sup>. The AUKUS nuclear submarine deal has also provoked questions and criticism from international scholars and experts.<sup>33</sup>

On March 14, 2023, Director General of the IAEA, Rafael Grossi, in his statement<sup>34</sup> indicated the “the serious legal and complex technical matters” in relation to the process required under Article 14 of Australia’s CSA. He noted that once the arrangement is finalized, it will be transmitted to the IAEA Board of Governors “for appropriate action”. The Director General “will ensure a transparent process that will be solely guided by the Agency’s statutory mandate and the safeguards agreements and additional protocols of the AUKUS Parties”. On June 6, 2023, Rafael Grossi addressed the issue again in his statement during the BoG meeting.<sup>35</sup>

The Safeguards Implementation Report (SIR) on 2022 by the Director General only mentions the conduction of technical consultations with the parties to AUKUS and the discussions held on “the possible implications of naval nuclear propulsion under AUKUS on the implementation of Agency safeguards”.<sup>36</sup>

The IAEA Board of Governors repeatedly decided by consensus to set up a formal agenda item to discuss “transfer of nuclear materials in the context of AUKUS and its safeguards in all aspects under the NPT”. Thus, the Board implicitly recognized the need for wide consideration of possible non-proliferation implications of the deal with a view to address various concerns and minimize proliferation risks.



## **IV. Risks and Challenges to the Nuclear Non-proliferation Regime**

The AUKUS initiatives envisages the transfer from two nuclear weapon states-parties to the NPT to a non-nuclear-weapon state-party to the NPT of the following materiel:

- a) Military submarines with nuclear propulsion;
- b) Weapons-grade HEU nuclear fuel for those submarines in quantities enough for 160 nuclear warheads;
- c) Intermediate range precision-guided missiles of the type prohibited by the now defunct INF Treaty with non-nuclear warheads.

It should be noted at the same time, that the transfer of nuclear weapons or other nuclear explosive devices or nuclear-armed missiles is not envisaged under the current AUKUS deal. However, even if this transaction does not involve nuclear weapons per se, it is without any precedent and of such magnitude that a profound review of its consistency with the non-proliferation regime is definitely required.

In order to answer the question about potential challenges and risks to the non-proliferation regime, it would be worth giving a quick look at what the regime is. In fact, it is a complex system of legal and administrative arrangements, international organisations and committees with the main purpose of preventing the appearance of new nuclear weapon states, as well as stopping the nuclear arms race and proceeding to nuclear disarmament. The NPT is at the centre of the nuclear non-proliferation regime. The regime includes also regional non-proliferation treaties, that have established nuclear-weapon-free zones in various areas, such as Latin America, Africa, Central Asia, South-East Asia, and South Pacific. Then, there is the IAEA with its system of safeguards, which is verifying and promoting compliance – primarily by non-nuclear weapon states – with the important segment of the NPT, covering peaceful uses of nuclear energy. There are also Nuclear Suppliers Group and Zangger Committee, 1540 Committee, established by the UNSC resolution 1540. And there are many national

legislations covering nuclear export control and related issues. Not all of these elements are strongly related to each other but weakening of any of them can have a detrimental effect on the regime as a whole.

So far, the debate around harmful consequences, that AUKUS implementation might bring to the regime, has been rather limited, and often superfluous – possibly, on purpose. On the one hand, there are easy to understand, but not necessarily the most realistic concerns about direct clandestine transfer of nuclear weapons, straightforward diversion of HEU from nuclear propulsion to nuclear warheads, which are being countered by “trust me” or “read my lips” type arguments. On the other, there is a deliberate attempt to minimize the scope of the problem and to make it look like a routine case of applying Article 14 of CSA, which provides the room for temporary non-application of safeguards to nuclear material used for non-proscribed military purposes (like propulsion as the case is). However, there is nothing routine about the AUKUS scenario, IAEA has neither precedents, nor experience in its records, and irrespective of final outcome, its achievement will require collective wisdom, search for new approaches and due consideration of issues outside the Article 14 terrain. In other words, one should look at the whole spectrum of potential risks and challenges and to address them in a scrupulous and balanced manner.

To start with, it is important to understand a wider security and doctrinal framework which gave birth to AUKUS. As already mentioned, it may well be the case that the US is developing a new model of “Great Power Competition” aimed at China and Russia. One of very serious potential and not fully realized consequences of such model is stimulation of the interest in participating non-nuclear-weapon states in nuclear weapons options. In the case of Australia, this is particularly disturbing, given this country’s past nuclear weapons aspirations and preparations which continued since early 1950s till mid-1970s. Australia had explored several pathways to nuclear weapons possession – initially by receiving weapons from the UK – and later by developing own capabilities (*for more details of past Australia’s proliferation efforts see the insert*). As a result,

confidence of other regional states in Australia's continued absence of nuclear ambitions may erode (which, in turn, would lead to their increased demands for more openness and more rigid verification of Australia's non-proliferation obligations). It can also be argued that the AUKUS project will likely reduce political and moral barriers to nuclear proliferation in the region as it reflects negligence on the part of the US and the UK to their NPT obligation "not to encourage or induce any non-nuclear-weapon state to manufacture or otherwise acquire nuclear weapons..."

### **The Historical Background of Australia's Nuclear Program**

In retrospect, Australia strongly sought joining the nuclear club until 1972. The history of the Australian nuclear program can be broadly divided into two phases:<sup>37</sup> 1) the attempted procurement phase, i.e., obtaining access to nuclear weapons by means of a third party (1956–1963) and 2) the indigenous capability phase by developing a national nuclear arsenal based on building an appropriate scientific, technical and technological capability (1964–1972). The defense establishment, the civilian atomic energy authority and the Ministry of Supply particularly lobbied for acquiring nuclear weapons.

There were high hopes for assistance in procuring nuclear weapons from the United Kingdom, which conducted tests of nuclear weapons and delivery systems in Australia from 1952 to 1963. Australian leaders assumed that such a level of technological and political engagement with the UK in the nuclear field would enable an agreement to be reached on the transfer of control over some British nuclear munitions to Australia.<sup>38</sup>

It is worth noting that the UK readily responded to Australia's requests for help with nuclear weapons. For the UK, assisting Australia was an opening opportunity not only to help a Commonwealth cousin, but also to reap economic benefits by selling Canberra the British airplanes that would deliver the a-bombs.<sup>39</sup> Given the UK's nuclear cooperation agreements with the United States, all of these potential deals with Australia had to be approved by the U.S. Although the Australian leadership repeatedly brought up the issue of acquiring nuclear weapons, no political decision had been taken.

At the same time, during the late 1960s, lobbying within the Australian government to build its own nuclear weapons continued. It was planned to develop nuclear technology capabilities under the guise of a peaceful nuclear energy program, which could be diverted to nuclear weapons if a political decision was taken in this regard. The feasibility of building a reactor capable of producing sufficient plutonium to make 30 nuclear warheads annually was studied.

The keystone of this ambition was the planned 500 MW nuclear power reactor in Jervis Bay.<sup>40</sup> The centrifuge technology for uranium enrichment was also being developed independently in secrecy. The British scientists involved in the Manhattan Project were engaged in this work.

## More specific threats

While paragraph above addresses general military-political challenges to the global non-proliferation regime, there are more specific threats, which, if not addressed, can lead to regime's weakening.

The AUKUS project – deliberately or accidentally – is exploiting an important built-in vulnerability of the non-proliferation regime. The way the regime had been originally designed and subsequently perfected, generates the focus on detecting, exposing and eventually preventing attempts to divert

Nevertheless, the shift in the foreign military and domestic political environment prompted Australia to abandon plans to acquire nuclear weapons in late 1972. In particular, Australia might otherwise have been deprived of U.S. defense under the ANZUS Security Treaty. On 23 January 1973, Australia completed the NPT ratification process and on 10 July the IAEA's Comprehensive Safeguards Agreement came into force. Australian scientists' work on the national centrifuge uranium enrichment project was terminated in the early 1980s, while the laser enrichment R&D activities (the Silex project) remains ongoing at the present time.<sup>41</sup>

*For further details of the history of Australian nuclear weapons program and nuclear fuel cycle development, see, for example, Clarence Hardy. Enriching Experiences: Uranium Enrichment in Australia, 1963-2008. Peakhurst, NSW: Glen Haven, 2008. 174 pp.; Lorna Arnold, Mark Smith. Britain, Australia and the Bomb: The Nuclear Tests and their Aftermath. Basingstoke: Palgrave Macmillan, 2006. 336 pp.; Wayne Reynolds. Australia's Bid for the Atomic Bomb. Melbourne University Press, 2000. 284 pp.*

nuclear materials and installations in non-nuclear-weapon states from legitimate peaceful activities to nuclear weapons purposes. Moreover, in most – if not all the rules – there is an assumption that nuclear facilities of concern are located on the territory of a given non-nuclear-weapon state. This applies to the NPT, to the IAEA system of safeguards, to the basic documents of NSG and Zangger Committee (in the case of Zangger Committee one could assume that its agenda deals mostly with states not party to the NPT, but some documents relate to non-nuclear-weapon states in general). Failure to address properly all these requirements and an in-depth analysis of how they may apply to the HEU and reactor transfers envisaged in the AUKUS deal will create a breach in the system of non-proliferation obligations and an invitation for other countries to look for similar or comparable exemptions, be it in the area of nuclear-powered

submarines or some other nuclear activity or related commercial transactions, where they may have particular interests.

That may, in turn, affect the work of the Nuclear Suppliers Group where the precedent of transfer of military reactors and tons of HEU can damage mutual confidence among participating states and erode Group's effectiveness in general – especially if such a transfer is executed without strong verification and control measures. Furthermore, it may trigger a dangerous trend of various nuclear suppliers weakening their respective nuclear export control regimes. Hence, an analysis of the AUKUS nuclear submarine deal in the NSG framework is required.

The same applies to complex body of national legislations regarding export control, conditions for involvement in international cooperative projects and similar activities – with the same risk of diluting the relevant norms. Which means that the adequacy of NPT-related Australian national implementing legislation and mechanisms should become subject of an international review, probably in the framework of 1540 Committee.

### **Specific challenges to IAEA and safeguards system**

One can envisage two types of direct risks for the IAEA and its system of safeguards. On the one hand, the IAEA is currently not fully equipped to effectively provide assurances regarding non-diversion of HEU in a NNWS in a non-proscribed military activity unless it develops new procedure, which would be adequate for this particular situation. Such procedures would require serious negotiations involving all interested Member States. However, this can require a long and difficult negotiations process. On the other hand, and probably much more serious risk would emerge if the attempt were made to “resolve” the issues through behind-the-scenes discussions between the parties of AUKUS and the IAEA Secretariat. This would lead to the politicisation of the Secretariat and severely undermine the over-all trust in the IAEA.

### **Risks for nuclear-weapon-free zones**

Furthermore, the AUKUS project carries risks for the South Pacific Nuclear Free Zone Treaty (Treaty of Rarotonga), which is also an important part of the non-proliferation regime, especially for the geographical area of its application. On the positive side, the Treaty of Rarotonga contains various procedures, not only for consultations, but also for complaints and special inspections (which the IAEA does not have, and which activation may help alleviate some of potential concerns about Australia's compliance with its non-proliferation obligations). If that is not done, the Treaty of Rarotonga and its authority might also be damaged.

### **Risks related to transfer of significant amounts of HEU**

One should not completely ignore the risk of direct diversion of HEU with very serious consequences, although the probability of that is relatively low. However, there are some precedents that need to be factored in the risk assessment. In particular, the presumed disappearance of more than 300 kg of HEU from the Apollo nuclear plant in Pennsylvania, US, processing HEU for naval reactor fuel. While the full circumstances remain unknown to the public, there is strong evidence of possible diversion of the missing HEU for nuclear weapon purposes outside of the United States.<sup>42</sup> Furthermore, the envisaged transfer of significant amounts of HEU appears to be inconsistent with a multiyear international efforts (largely led by the US) to minimize the global use of HEU.<sup>43</sup>

### **Risk of MTCR degrading**

Last, but not least: there are risks for other non-proliferation regimes, such as the MTCR, one of whose objectives was to stop proliferation of potential means of delivery of nuclear weapons. Tomahawk cruise missiles which would be provided by the United States to Australia have a range of 1,700 kilometers, far exceeding the maximum limit established of the Missile Technology Control System (MTCR). The door is thus being opened for the demise of the MTCR,

which in turn would deal another blow to the nuclear non-proliferation regime as such.

In conclusion: the AUKUS project carries a number of potential risks which, if not properly addressed, will inflict severe damage on the nuclear non-proliferation regime and its important constituent parts. For some of those risks answers probably can be found, at least partially. However, policies and tactics aiming to avoid serious deliberation of those risks in the IAEA and other relevant fora, can only exacerbate the situation.

## V. Challenges to IAEA Safeguards System

### The issue

The IAEA safeguards system serves as the NPT's verification system to confirm that the non-nuclear weapon states parties to the NPT comply with their undertakings not to acquire nuclear weapons. To allow the IAEA to verify the compliance with this undertaking, each such state concludes in accordance with the provision of the Article III.1 of the NPT the comprehensive safeguards agreement with the IAEA. The agreement contains Article 14, which provides for non-application of safeguards for nuclear material in non-proscribed military activity.

As it was mentioned in the report earlier, under the AUKUS nuclear submarine deal, about four tons of HEU will be supplied to Australia for the use in nuclear submarines. The supplied material will be in the form of nuclear fuel loaded in the reactor vessel.

According to Article 14 of the comprehensive safeguards agreement between Australia and the IAEA (INFCIRC/217), safeguards will not be applied to this material while it is used in non-proscribed military activity in nuclear submarines. It is going to be the first case of practical implementation of Article 14 provisions. However, there still remains a lot of unanswered questions in relation to interpretation and implementation of the Article 14, such as legal basis, concrete procedure, technical feasibility, etc. An interpretation of the provision of Article 14 for practical implementation will have significant impact on the ability of the IAEA to confirm that this nuclear material is not used for the manufacture of nuclear weapons. This problem, if not adequately addressed, may undermine the IAEA safeguards system. This may have further negative impact on the sustainability of the NPT and non-proliferation regime.

The IAEA Secretariat and the Member States shall strive to reach a common understanding of comprehensive interpretation of Article 14 and take necessary measures to enhance the IAEA's authority.



## **Historical background**

The Safeguards Committee which developed INFCIRC/153 adapted the original IAEA safeguards system, described in INFCIRC/66, for the purpose of verifying that the NNWS parties to the NPT comply with their obligations under the Treaty. Conceptual difficulties associated with that process affected the content and the terminology of INFCIRC/153. The “completeness” issue and such terms as “diversion from peaceful nuclear activities”, “non-application of safeguards”, “starting point of safeguards”, and “exemption from safeguards” required further clarification when implementing the comprehensive safeguards agreement.

Until 1991 these difficulties did not affect the practical implementation of safeguards. However, starting from 1991, the Agency and its Member States undertook to strengthen safeguards and develop measures which included the introduction of the Model Additional Protocol (INFCIRC/540), and the introduction of the Integrated Safeguards and the state-level concept (SLC). Around 2000, the Agency started to use state-level approaches (SLAs), developed for each individual state, instead of former facility-level approaches.

Until present time, the difficulties in interpreting provisions of paragraph 14 of INFCIRC/153 (Article 14 in the case of Australia’s CSA) were not prominent as these provisions have never been put to use. Now, as the IAEA faces the practical task of implementing these provisions in Australia, the IAEA and its Member States should address the legal and technical aspects of Article 14 to ensure the continued effectiveness of the safeguards system.

In this regard, there was, in 1978, an exchange of views on this subject between Australia and the IAEA, which was documented in GOV/INF/347. At that time Australia asked the Agency to confirm whether Australia’s understanding of certain provisions and procedures of paragraph 14 of INFCIRC/153 was correct, in particular:

- that it would be the responsibility of the IAEA BoG to “make clear” the matters referred in paragraph 14;

- that the “arrangement” referred to in paragraph 14 (b) would be referred to the BoG and would require its approval;
- that if the state does not follow the prescribed procedures, this would constitute a breach of the safeguards agreement which would be reported to the BoG.

The IAEA Director General responded that this understanding was correct. Further, paragraph 2.14 of the IAEA Safeguards Glossary of 2001 edition, had the following clarification regarding the “arrangement” referred in paragraph 14 (b) of INFCIRC/153: “Any such arrangement would be submitted to the IAEA Board of Governors for prior approval”. However, in the IAEA Safeguards Glossary of 2022 edition, paragraph 2.15, this wording was modified to read: “Any arrangement pursuant to para 14 of [153] will be reported to the IAEA Board of Governors”.

The reasons why this significant change has been made have not been adequately elaborated. It is therefore strongly advisable for the IAEA Secretariat to substantiate the change and to explain consequences that its new approach would have for deliberations on AUKUS related issues compared to the old one.

### **Implementation of state-level approach in Australia**

Australia was among the first states to conclude the Additional Protocol. It was also among the first states for which the IAEA had drawn the broader conclusion and started the implementation of a state-level approach. The IAEA continues to maintain, on annual basis, the broader conclusion for Australia, namely that “All nuclear material in Australia remained in peaceful nuclear activities”.

When operation of nuclear submarines will start in Australia, the state-level approach for Australia will have to be further developed to take into account the provisions of Article 14 of the agreement concerning the nuclear material used in the nuclear submarines propulsion systems. The new SLA should contain verification activities to cover an additional acquisition path associated with the nuclear material in question:

- a) undeclared withdrawal of nuclear material from one or several nuclear submarines;
- b) undeclared processing of this material at declared and/or undeclared facilities to produce weapon-usable material.

In light of the significant changes in Australia's domestic nuclear activities resulting from the acquisition of nuclear submarines and the use of nuclear material in non-proscribed military activity, the broader safeguards conclusions routinely made by the IAEA on Australia based on SLAs will no longer be readily available, demonstrating once again that the AUKUS nuclear submarine deal poses a significant challenge to the Agency's existing safeguards system.

In addition, SLAs need to be adapted, which should at least include more stringent verification measures. It requires the Member States to establish an expert group for further discussion.

#### **Arrangement between Australia and the IAEA under the Article 14**

The arrangement under the Article 14 of Australia's CSA should include the following procedures:

- reporting by Australia of the receipt of the material and taking it under its jurisdiction; provision to the Agency of design information and information on nuclear material accountancy, verification of this material by the IAEA prior to exempting it from the procedures described in the CSA;
- implementing measures to confirm that the material is on board of the submarine while the submarine is in a port;
- upon discharge of spent fuel from submarines full safeguards procedures of the CSA shall apply to this material.

There will be two scenarios of acquiring the SSNs by Australia: 1) SSNs with nuclear reactors will be provided by the US; 2) submarines will be constructed in Australia and reactors will be supplied by the UK. Safeguards measures should be developed in accordance with these two scenarios.

The intergovernmental process in the Agency aimed at focusing on the complexity of the AUKUS related issues should be launched in view of the absence of the relevant precedents.

## **VI. Other Nuclear Risks Associated with the Initiative**

On the announcement of the AUKUS nuclear submarine project the three states expressed their commitment to adhere to the highest standards for safety and security of nuclear material and technology.<sup>44</sup>

The document from 13 March 2023 titled “The Fact Sheet: Trilateral Australia-UK-US Partnership on Nuclear-Powered Submarines” indicated that “the United Kingdom and United States intend to provide Australia with nuclear material in complete, welded power units that will not require refueling during their lifetime”<sup>45</sup>, meaning that the nuclear fuel will already be inside the reactor when transported to Australia. The question arises as to how the parties to AUKUS will ensure nuclear safety during the transportation of these power units to Australia.<sup>46</sup>

Considering that transportation would take place through international waters, it would be necessary to provide a comprehensive and thorough evaluation that accounts for credible initiating events and potential external impacts during transportation, along with safety justification. Conditions during transportation, which may involve some risk of sinking, should also be taken into account.

The route along which these power units will be transported and the mode of transportation are also very important, especially for those states near which the transportation route may run.

To this date, there has been no specific information provided about the issues mentioned above by the parties involved in the AUKUS nuclear submarine deal. Considering that there have been no such precedents in the history before, it would be extremely important if the IAEA could organize discussions with participation of experts from the IAEA Member States on how nuclear material “in complete, welded power units” will be transported. These discussions should address all technical (safety and security) and legal aspects of the transportation of such welded power units through international waters.

## **VII. Implications for Regional and Global Security**

### **Destabilising effects**

AUKUS is considered by many as both a product and incarnation of a new “Great Power Competition” model, which essentially motivates and empowers US allies and other partner countries to conduct more aggressive regional policies while integrating further into the US nuclear deterrence posture. That includes deploying or transferring modern weapons systems capable of delivering counterforce non-nuclear strikes, including in coordination with the US forces. These trends are also visible in other Pacific nations, as well as in Europe, where some of the US allies are being stimulated to procure the Tomahawk sea-launched cruise missiles for their surface warships and submarines alike, as well as JASSM<sup>47</sup> family of air-to-surface cruise missiles. As a result, one should expect an intensified arms race, involving new weapons systems, further destabilisation of strategic situation, new uncertainties for regional security, up to triggering military confrontation and increased nuclear risks.

### **The arms race dynamics**

The precedent set by AUKUS nuclear submarine cooperation is likely to spur some countries to follow suit in possessing nuclear submarines, as well as other anti-submarine warfare and long-range strike capabilities, triggering a regional submarine arms race, raising the risk of military conflict, which can eventually escalate all the way to the nuclear threshold.

Another crucial development is the fact that it is becoming a new normal to see ‘extended nuclear deterrence’ relationships shift from NWS providing a ‘nuclear umbrella’ for the NNWS to NNWS non-nuclear capabilities enabling and enhancing NWS nuclear operations, e.g. “ROK conventional support to U.S. nuclear operations”<sup>48</sup> or NATO SNOWCAT<sup>49</sup> missions.<sup>50</sup>

Another challenging and troubling dimension of AUKUS is Australia’s integration in the US-UK cooperation in the context of the US-UK Mutual

Defence Agreement of 1958.<sup>51</sup> While now the emphasis is on the nuclear technology related to the nuclear propulsion for submarines, it is just one of the projects under the agreement, which includes also “development of delivery systems compatible with the atomic weapons they carry” and “training of personnel in the employment of and defense against atomic weapons and other military applications of atomic energy.”<sup>52</sup>

### **Disruptive effects of AUKUS military capabilities**

There are several types of nuclear-powered submarines. Strategic ‘boomers’ (SSBN) are traditionally perceived as a secure second-strike capability (with a notable exception of the so-called depressed trajectories for the submarine-launched ballistic missiles<sup>53</sup>). On the contrary, multi-purpose nuclear submarines (SSN) carrying cruise missiles and enhancing underwater situational awareness can actually undermine second strike, by posing threat to the other side’s strategic capabilities, including nuclear command, control, and communications (NC3) system elements and even the aforementioned SSBNs.

The Royal Australian Navy's planned Virginia-class and eventually SSN-AUKUS nuclear-powered submarines are likely be equipped with universal vertical launch systems capable of hosting the Tomahawk and probably LRASM<sup>54</sup> families of long-range and anti-ship cruise missiles, and eventually even the larger, faster, and longer-range hypersonic weapons being developed under the US Navy Conventional Prompt Strike (CPS) program (which might be ready for deployment around 2028).<sup>55</sup> These missiles while non-nuclear in nature can be capable of fulfilling some of the strategic missions previously assigned to the nuclear weapons, including strikes against hardened targets. There is currently no credible information about plans to have the so-called Virginia Payload Module (VPM) on “Australian” Virginia-class submarines<sup>56</sup>, but even the more "modest" Virginia Payload Tube (VPT) could conceivably be adapted for those “large” missiles.<sup>57</sup> Moreover, as of today at least one of the Virginia-class submarines will be newly-built<sup>58</sup>, so completely ruling out the

appearance of universal VPM with launchers capable of hosting long-range hypersonic weapons seems premature.

All the missiles mentioned have non-nuclear variants now, but the U.S. nuclear-armed, sea-launched cruise missile (SLCM-N) program has not yet been completely shut down<sup>59</sup>, and revision of approaches to hypersonic systems can not be ruled out either. Moreover, as of today, both the US House<sup>60</sup> and Senate<sup>61</sup> armed services committees highly support the SLCM-N program.

It is important to reiterate: non-nuclear long-range strike capability also affects nuclear deterrence and strategic stability. It is a well-established fact that while current non-nuclear strategic weapons cannot carry out all the missions provisioned for the nuclear weapons (for example, destroying an ICBM silo) those still can produce strategic effects.<sup>62</sup> Moreover, Australia has been and remain a participant in a major hypersonic weapons related research and development.<sup>63</sup>

So far there are no signs that Australia is pursuing domestic or shared nuclear weapon capability, there are ongoing developments that can facilitate introduction of nuclear weapons should such decision be made. Historically, having one's nuclear weapons operated (at least to some extent) by an allied country is nothing uncommon.



## **VIII. Conclusion and Recommendations**

The key role of the NPT in preventing the spread of nuclear weapons, reducing nuclear risks, and achieving nuclear disarmament is indisputable. The extensive range of potential risks posed by both AUKUS trilateral alliance and AUKUS nuclear-powered submarine initiative, may inflict severe long-term damage on the nuclear non-proliferation regime and the NPT, which is a core of the regime.

The risks, discussed in detail in the preceding chapters of this report, broadly fall into two categories. The first category includes more specific risks (and problems) affecting specific segments of the non-proliferation regime, such as the IAEA system of safeguards, stability within the IAEA as a whole and Member States' trust in this paramount organization, as well as the situation with smaller, but still very important segments of the regime, such as the NSG or the MTCR. And, some risks may be border-line. The second category comprises risks that are more general and are related to strategic stability and wider international security. In essence their potential negative impact stems from dramatic changes to security situation in vast West Pacific and Indian Ocean basins, including the introduction of new weapons systems with strategic capabilities, rapidly accelerating arms race, higher potential for conflict, accompanied by lowering of the nuclear threshold.

One way or another, the AUKUS controversy has highlighted the need to make the nuclear non-proliferation regime more resilient to this and possible future similar challenges.

It is in the best interest of all States to collectively address and mitigate such challenges. The AUKUS deal includes one particular challenging aspect – the emergence of risks comes from the inside of the regime, namely from two depositaries of the NPT and one non-nuclear-weapon state party to it. Intentionally or not, the AUKUS misuses vulnerable spots of the NPT in favor of its parties' short-term and mid-term national interests. In addition to this, the transparent approach the AUKUS partners promised to carry out so far has not translated into action. Due to the poor amount of information provided,

ambiguity appears. That makes states wonder and question intentions of Australia as to what extent it will be integrated into cooperation between London and Washington in the context of the US-UK Mutual Defence Agreement (1958) or how the nuclear submarine deal between the three States is going to develop in the future. It is also notable that Australia, being one of the main driving forces behind the drafting of the South Pacific Nuclear Free Zone Treaty (Rarotonga Treaty), undertook obligations “to support the continued effectiveness of the international non-proliferation system based on the NPT and the IAEA safeguards system”.<sup>64</sup> The current situation though creates risks of reducing the effectiveness of both.

In this sense, several recommendations are provided, which may not be comprehensive or exhaustive in regard to AUKUS trilateral alliance and its AUKUS nuclear-powered submarine initiative but are aimed at reducing associated risks and mitigating negative implications of the deal.

*Actions to uphold the international nuclear non-proliferation regime.* States need to address the risks of AUKUS issue through open and inclusive dialogue and cooperation. Such cooperation, carried out on a regular basis, needs to entail a range of activities aimed to increase transparency and predictability, ensure the safety of nuclear material, and establish trust and confidence. The NPT Review Conference (including its preparatory cycle), the IAEA General Conferences and the Board of Governors are the most appropriate platforms to facilitate comprehensive discussions on the issues of naval nuclear propulsion in the context of AUKUS. However, other organizations and mechanisms should also be involved, especially where the IAEA does not have relevant competencies and authority – for example with regard to additional verification and confidence building measures to reassure the relevant HEU material has not been diverted for nuclear weapons. The mechanisms envisaged in the Treaty of Rarotonga, including consultations and special inspections, might be useful in this regard.

*Ensuring a transparent approach.* The AUKUS partners expressed their commitment to adhere to “the highest standards” for transparency in joint leaders’

statements on multiple occasions. Thus far, states concerned about the AUKUS deal have not received any specific information on how arising risks and challenges to non-proliferation regime and IAEA Safeguards System, and concerns on safety of nuclear material will be addressed. Since the announcement of the AUKUS deal, there have not been any substantial technical, policy or legal briefings or consultations on Article 14 involving the Secretariat, AUKUS parties and the Member States concerned. In this sense, the transition from statements to actions is necessary along with an application of a transparent approach in delivered weapon systems, in order to reduce the destabilizing effect on international missile export control mechanism including NSG, 1540 Committee, and MTCR.

***Article 14 of the CSA.*** Since the provisions under Article 14 of the CSA has never been put to use, the difficulties in their interpretation were not prominent. Now, as the IAEA faces the practical task of implementing these provisions, the IAEA Member States should take an active part in the development of Article 14 comprehensive reading, as well as of an arrangement under Article 14, to ensure the continued effectiveness of the safeguards system. It is the Member States of the Agency and its governing bodies, including the IAEA Board of Governors, that should be involved in discussing and approving the arrangement.

***The role of the IAEA Member States and Board of Governors.*** The historical practice of the Agency has proven that inclusive consensus is a long-term and sustainable solution in developing and adopting arrangements. The IAEA Member States should take part in the development of arrangements on conceptual issues related safeguards, that, specifically, includes the arrangement necessary under Article 14 of Australia's CSA.

Traditionally the IAEA Secretariat depends on expertise from Member States technology holders in case of application of safeguards. Given the importance of the issue for the long-term well-being of the NPT and the non-proliferation regime, the Secretariat and the IAEA Member States shall consider using the following types of fora.

First is the establishment of a Special Committee open to all IAEA Member States, to deliberate on the political, legal and technical issues related to the safeguards on naval nuclear propulsion reactors and their associated nuclear material of a NNWS, and submit a report with recommendations to the Board of Governors and the General Conference of the IAEA.

Second is the establishment of a special expert group.<sup>65</sup> Usually when it is needed to consider possible ways to apply safeguards for the new type of nuclear facilities, develop a new safeguards methods and equipment or develop new safeguards concepts the Secretariat invites the Member States to send specialist to take part in meetings of a special expert group. The Secretariat can also personally invite the specialist/experts on its own capacity. Such approach was used by the Agency to develop the safeguards approaches for large scale reprocessing, final disposal of nuclear materials in geological formations, for new generations of surveillance systems, for new generations of unattended monitoring systems and others.

Any arrangement under Article 14 of the CSA will inevitably be invoked as a precedent for other States. If the arrangement is concluded between Australia and the IAEA without both expert and governmental open-ended discussions between Member States, it could threaten the universal nature of the safeguards approach and could have a negative impact on the effectiveness and sustainability of the Agency's safeguards system in the long run. Hence, it is important to discuss the arrangement beforehand with the IAEA Member States with a view to adopting it by consensus. Ensuring a reliable and effective arrangement under Article 14 and establishing a precedent in favor of the NPT and non-proliferation regime are important for the integrity and future of the regime.

*Ensuring safety and security of nuclear material and technology.* The Member States and the IAEA Secretariat should also bear in mind nuclear safety and security issues emerging from transportation of the nuclear material in complete, welded power units to Australia. A great number of factors, including

packaging, the prevention of criticality, shutdown conditions, heat decay, impacts of natural or manmade origin, and etc. must be taken into account. The IAEA and parties to AUKUS deal should initiate discussions on this topic with an inclusive participation of all States concerned.

*Need for broad and inclusive discussions.* It would be important to continue supporting the study of the AUKUS alliance, its meaning and consequences for the nuclear non-proliferation regime and geopolitical environment as a whole. The issue of further development of the AUKUS alliance and AUKUS submarine deal should remain in the focus of the international expert community, research centers and think-tanks as they can offer new ways to solving the issues through conducting regular workshops and discussions with the participation of all interested parties, including representatives of the three States, the IAEA Secretariat, as well as other competent bodies, like the Rarotonga Treaty, 1540 Committee, NSG, and MTCR.

## Endnotes

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- <sup>2</sup> Joint Leaders Statement on AUKUS, 15 September 2021, <https://www.whitehouse.gov/briefing-room/statements-releases/2021/09/15/joint-leaders-statement-on-aukus/> (last accessed – June 22, 2023).
- <sup>3</sup> Exchange of Naval Nuclear Propulsion Information Agreement (ENNPPIA), [https://www.aph.gov.au/Parliamentary\\_Business/Committees/Joint/Treaties/ENNPPIA/Treaty\\_being\\_considered](https://www.aph.gov.au/Parliamentary_Business/Committees/Joint/Treaties/ENNPPIA/Treaty_being_considered) (last accessed – June 22, 2023).
- <sup>4</sup> FACT SHEET: Trilateral Australia-UK-US Partnership on Nuclear-Powered Submarines, 13 March 2023, <https://www.whitehouse.gov/briefing-room/statements-releases/2023/03/13/fact-sheet-trilateral-australia-uk-us-partnership-on-nuclear-powered-submarines/> (last accessed – June 22, 2023).
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- <sup>6</sup> Foreign Affairs, Defence and Trade Legislation Committee, 30 May 2023, p. 59, [https://parlinfo.aph.gov.au/parlInfo/download/committees/estimate/26910/toc\\_pdf/Foreign%20Affairs,%20Defence%20and%20Trade%20Legislation%20Committee\\_2023\\_05\\_30.pdf;fileType=application%2Fpdf#search=%22committees/estimate/26910/0000%22/](https://parlinfo.aph.gov.au/parlInfo/download/committees/estimate/26910/toc_pdf/Foreign%20Affairs,%20Defence%20and%20Trade%20Legislation%20Committee_2023_05_30.pdf;fileType=application%2Fpdf#search=%22committees/estimate/26910/0000%22/) (last accessed – July 22, 2023).
- <sup>7</sup> FACT SHEET: Trilateral Australia-UK-US Partnership on Nuclear-Powered Submarines, 13 March 2023, <https://www.whitehouse.gov/briefing-room/statements-releases/2023/03/13/fact-sheet-trilateral-australia-uk-us-partnership-on-nuclear-powered-submarines/> (last accessed – June 26, 2023).
- <sup>8</sup> According to the Australian Ministry of Defence, the plan is to establish a fleet of eight nuclear-powered submarines in total, which includes three U.S. Virginia submarines and five SSN-AUKUS. If needed, the US will sell up two more Virginia-class submarines, thus, the proportion will change: five U.S. Virginia submarines and three SSN-AUKUS. In this context, Australia’s priority is to build more of SSN-AUKUS.
- <sup>9</sup> Foreign Affairs, Defence and Trade Legislation Committee, p. 91.
- <sup>10</sup> Joint media statement: Australia to pursue nuclear-powered submarines through new trilateral enhanced security partnership, 16 September 2021, <https://www.minister.defence.gov.au/statements/2021-09-16/joint-media-statement-australia-pursue-nuclear-powered-submarines-through-new-trilateral-enhanced-security-partnership> (last accessed – June 26, 2023).
- <sup>11</sup> UK Astute-class submarine is a prototype of a future SSN-AUKUS.
- <sup>12</sup> According to the IAEA Safeguards Glossary 25 kg is considered a significant quantity, for which the possibility of manufacturing a nuclear explosive device cannot be excluded, [https://www-pub.iaea.org/MTC/D/publications/PDF/PUB2003\\_web.pdf](https://www-pub.iaea.org/MTC/D/publications/PDF/PUB2003_web.pdf) (last accessed – June 22, 2023).
- <sup>13</sup> Communication dated 14 March 2023 received from the Permanent Mission of Australia to the Agency, INF/CIRC/1079, <https://www.iaea.org/sites/default/files/publications/documents/infcircs/2023/infcirc1079.pdf> (last accessed – June 26, 2023).
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- <sup>16</sup> Working paper submitted by China NPT/CONF.2020/WP.29, 29 November 2023, <https://reachingcriticalwill.org/images/documents/Disarmament-fora/npt/revcon2022/documents/WP29.pdf> (last accessed – June 22, 2023).
- <sup>17</sup> Statement by Mr. Tan Li Lung, 8 August 2022, [https://reachingcriticalwill.org/images/documents/Disarmament-fora/npt/revcon2022/statements/8Aug\\_MCII\\_Malaysia.pdf](https://reachingcriticalwill.org/images/documents/Disarmament-fora/npt/revcon2022/statements/8Aug_MCII_Malaysia.pdf) (last accessed – June 22, 2023).
- <sup>18</sup> Statement delivered by H.E. Carlos D. Sorreta, [https://reachingcriticalwill.org/images/documents/Disarmament-fora/npt/revcon2022/statements/1Aug\\_Philippines.pdf](https://reachingcriticalwill.org/images/documents/Disarmament-fora/npt/revcon2022/statements/1Aug_Philippines.pdf) (last accessed – June 22, 2023).

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<sup>19</sup> Statement by the Deputy Head of the Delegation of the Russian Federation at the Tenth Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons Mr. Igor Vishnevskii, [https://reachingcriticalwill.org/images/documents/Disarmament-fora/npt/revcon2022/statements/8Aug\\_MCII\\_Russia.pdf](https://reachingcriticalwill.org/images/documents/Disarmament-fora/npt/revcon2022/statements/8Aug_MCII_Russia.pdf) (last accessed – June 22, 2023).

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<sup>21</sup> Working paper submitted by China NPT/CONF.2020/WP.30, <https://reachingcriticalwill.org/images/documents/Disarmament-fora/npt/revcon2022/documents/WP30.pdf> (last accessed – June 27, 2023).

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<sup>27</sup> NPT/CONF.2020/WP.29, p. 3.

<sup>28</sup> Working paper submitted by Indonesia, NPT/CONF.2020/WP.67, <https://reachingcriticalwill.org/images/documents/Disarmament-fora/npt/revcon2022/documents/WP67.pdf> (last accessed – June 26, 2023).

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<sup>30</sup> Statement by the Permanent Representative of the Russian Federation to International Organizations in Vienna M.I. Ulyanov on the agenda item of the session of the IAEA Board of Governors, 8 June 2023, [https://docs.google.com/document/d/1TjO2lvu0G8pVEIUX6UPh\\_3ksFQd61Ve1/edit?usp=sharing&oid=114295127096001628114&rtfpof=true&sd=true](https://docs.google.com/document/d/1TjO2lvu0G8pVEIUX6UPh_3ksFQd61Ve1/edit?usp=sharing&oid=114295127096001628114&rtfpof=true&sd=true) (In Russian) (last accessed – June 26, 2023).

<sup>31</sup> Molekane, *Statement*.

<sup>32</sup> Baumann, *D claration prononc e*, p. 5.

<sup>33</sup> See the examples: Frank von Hippel, Professor of Public and International Affairs emeritus of Princeton University, Daryl G. Kimball, Executive Director of the Arms Control Association and many other non-proliferation experts and former US government officials jointly sent a letter to US President Joe Biden, expressing serious concerns that AUKUS will undermine the international non-proliferation regime, 26 July 2022, <https://sites.utexas.edu/nppp/files/2022/07/AUKUS-group-letter-Biden-RevCon-2022-July-26attachment.pdf> (last accessed – July 20, 2023); Report by CACDA and CINIS “A Dangerous Conspiracy: The Nuclear Proliferation Risk of the Nuclear-powered Submarines Collaboration in the Context of AUKUS”; Remarks by Anton Khlopkov at the workshop ‘The AUKUS and Article 14: Challenges Ahead’, 18 May 2023, p. 29, <https://www.iaea.org/sites/default/files/publications/documents/infcircs/2023/infcirc1091.pdf> (last accessed – July 19, 2023); Tariq Rauf, ‘Crashing Nuclear Submarines Through IAEA Safeguards’, Toda Peace Institute, Policy Brief No. 122, January 2022, [https://toda.org/assets/files/resources/policy-briefs/t-pb-122\\_crashing-nuclear-submarines-through-iaea-safeguards\\_rauf.pdf](https://toda.org/assets/files/resources/policy-briefs/t-pb-122_crashing-nuclear-submarines-through-iaea-safeguards_rauf.pdf) (last accessed – July 19, 2023); Ramesh Thakur, ‘The Minefields That Could Sink SSN AUKUS’, April 2023, [https://toda.org/assets/files/resources/policy-briefs/t-pb-156\\_the-minefields-that-could-sink-ssn-aucus\\_thakur.pdf](https://toda.org/assets/files/resources/policy-briefs/t-pb-156_the-minefields-that-could-sink-ssn-aucus_thakur.pdf), (last accessed – July 20, 2023).

<sup>34</sup> Paragraph 6, Director General Statement in Relation to AUKUS Announcement, 14 March 2023, <https://www.iaea.org/newscenter/pressreleases/director-general-statement-in-relation-to-aucus-announcement> (last accessed – June 22, 2023).

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<sup>36</sup> Tariq Rauf, 'The Looking Challenge to IAEA Safeguards: Naval Nuclear Propulsion', INFCIRC/1091 p. 14, Slide 82, 1 June 2023, <https://www.iaea.org/sites/default/files/publications/documents/infcircs/2023/infcirc1091.pdf> (last accessed – June 28, 2023).

<sup>37</sup> Jim Walsh, 'Surprise Down Under: The Secret History of Australia's Nuclear Ambitions', *The Nonproliferation Review*, Fall 1997, pp. 1-20, <https://www.nonproliferation.org/wp-content/uploads/npr/walsh51.pdf> (last accessed – July 1, 2023).

<sup>38</sup> Roland M. Timerbaev, 'Russia and Nuclear Non-Proliferation. 1945-1968.', *Nauka*, 1999, pp. 148-149, <https://clck.ru/34s2HZ> (last accessed – July 1, 2023).

<sup>39</sup> PRO: D0 35/8287; Chiefs of Staff Committee, Confidential Annex to C.O.S. (57) 70th Meeting Held on Tuesday, 10 September 1957, p. 1 (Top Secret, Specially Restricted Circulation). See, 'Jim Walsh, 'Surprise Down Under: The Secret History of Australia's Nuclear Ambitions'.

<sup>40</sup> Ian Bellany, 'Australia in the Nuclear Age: National Defense and National Development', Sydney University Press, 1972, pp. 81-82, <https://doi.org/10.2307/1960009> (last accessed – July 1, 2023).

<sup>41</sup> Uranium Enrichment Technology – the 'SILEX' laser isotope separation technology, <https://www.silex.com.au/silex-technology/silex-uranium-enrichment-technology/> (last accessed – June 28, 2023).

<sup>42</sup> In the period of 1960–1968 according to the U.S. Nuclear Regulatory Commission (NRC) 337 kg of HEU went missing from the Apollo uranium plant, owned by the Nuclear Materials and Equipment Corporation (NUMEC) in Pennsylvania, USA. In the 1960s, the Apollo plant among its other tasks was processing HEU enriched to 97.7 percent for naval reactor fuel. The AEC and subsequently one of its successor agencies, the NRC, as well as the Federal Bureau of Investigation (FBI), the Central Intelligence Agency (CIA), the National Security Council (NSC), and other subsidiary bodies investigated what became of the missing HEU. The results of the investigation showed circumstantial evidence that the lost uranium was transferred to Israel to facilitate nuclear weapon development in the state. *See more:* NRC Letter, from Robert F. Burnett, Director Division of Safeguards, NRC, to (Redacted), Federal Bureau of Investigation, 19 May 1982, <https://nsarchive.gwu.edu/document/22177-42-nrc-letter-robert-f-burnett-director> (last accessed – June 27, 2023); Roger J. Mattson, 'The NUMEC Affair: Did Highly Enriched Uranium from the U.S. Aid Israel's Nuclear Weapons Program?', National Security Archive, <https://nsarchive.gwu.edu/briefing-book/nuclear-vault/2016-11-02/numec-affair-did-highly-enriched-uranium-us-aid-israels-nuclear-weapons-program> (last accessed – June 27, 2023); Henry A. Kissinger, Memorandum for the President, 19 July 1969, <https://nsarchive2.gwu.edu/nukevault/ebb485/docs/Doc%2010%207-19-69%20circa.pdf> (last accessed – June 27, 2023); Victor Gilinsky and Roger J. Mattson, 'Revisiting the NUMEC affair', *Bulletin of the Atomic Scientists*, March/April 2010, [https://npolicy.org/article\\_file/Revisiting\\_the\\_NUMEC.pdf](https://npolicy.org/article_file/Revisiting_the_NUMEC.pdf) (last accessed – June 27, 2023).

<sup>43</sup> Transfer of significant amounts of HEU from the UK and US will be also inconsistent with the 'Statement of the G7 Non-Proliferation Directors Group', 09 May 2022, <https://www.diplomatie.gouv.fr/en/french-foreign-policy/security-disarmament-and-non-proliferation/news/2022/article/statement-of-the-g7-non-proliferation-directors-group-09-may-2022> (last accessed – July 20, 2023).

<sup>44</sup> Joint Leaders Statement on AUKUS. September 15, 2021. The White House. <https://www.whitehouse.gov/briefing-room/statements-releases/2021/09/15/joint-leaders-statement-on-aucus/> (last accessed – June 7, 2023).

<sup>45</sup> FACT SHEET: Trilateral Australia-UK-US Partnership on Nuclear-Powered Submarines. March 13, 2023. The White House. <https://www.whitehouse.gov/briefing-room/statements-releases/2023/03/13/fact-sheet-trilateral-australia-uk-us-partnership-on-nuclear-powered-submarines/> (last accessed – June 7, 2023).

<sup>46</sup> There is a common understanding that the U.S. Virginia-class submarines will arrive from the US to Australia on a stand-alone basis, whereas the UK will provide Australia with nuclear reactors for the SSN-AUKUS that will be manufactured in Australia.

<sup>47</sup> JASSM = Joint Air-to-Surface Standoff Missile.

<sup>47</sup> Background Press Call by Senior Administration Officials on the AUKUS Announcement, The White House, March 13, 2023, <https://www.whitehouse.gov/briefing-room/press-briefings/2023/03/13/background-press-call-by-senior-administration-officials-on-the-aucus-announcement/> (last accessed – June 22, 2023).

<sup>48</sup> Washington Declaration, April 26, 2023, <https://www.whitehouse.gov/briefing-room/statements-releases/2023/04/26/washington-declaration-2/> (last accessed – June 22, 2023).

<sup>49</sup> SNOWCAT = Support of Nuclear Operations with Conventional Air Tactics.



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- <sup>53</sup> Lisbeth Gronlund, David C. Wright, "Depressed trajectory SLBMs: A technical evaluation and arms control possibilities," *Science & Global Security*, 3, no. 1-2, (1992): 101-159.
- <sup>54</sup> LRASM = Long Range Anti-Ship Missile.
- <sup>55</sup> 'Hypersonic Weapons: Background and Issues for Congress', Congressional Research Service, 13 February 2023, <https://crsreports.congress.gov/product/pdf/R/R45811> (last accessed – June 22, 2023).
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- <sup>58</sup> 'Australia To Get One New Build Virginia Class Submarine', Two From U.S. Navy, The War Zone, 8 June 2023, <https://www.thedrive.com/the-war-zone/australia-to-get-one-new-build-virginia-class-submarine-two-from-u-s-navy> (last accessed – June 22, 2023).
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- <sup>61</sup> Senate Armed Services clears defense bill, dodging contentious House amendments, The Hill, June 23, 2023, <https://thehill.com/policy/defense/4065171-senate-armed-services-clears-defense-bill-dodging-contentious-house-amendments/> (last accessed – June 22, 2023).
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- <sup>64</sup> South Pacific Nuclear Free Zone Treaty (with annexes). <https://treaties.un.org/doc/Publication/UNTS/Volume%201445/volume-1445-I-24592-English.pdf> (last accessed – June 22, 2023).
- <sup>65</sup> The activity of a special expert group can be conducted in forms of consultant group meetings, advisory group meetings, project teams, workshop, etc.

## **Appendix 1. Chinese Working Group**

### **Chair:**

**LI** Chijiang, Vice President and Secretary-General, China Arms Control and Disarmament Association (CACDA)

### **Participants:**

**LUO** Qingping, Chairman of the Board, Institute of Nuclear Industry Strategy (CINIS)

**WANG** Ying, Researcher, Institute of Nuclear Industry Strategy (CINIS)

**WANG** Chunfen, Researcher, Institute of Nuclear Industry Strategy (CINIS)

**XU** Chunyang, Researcher, Institute of Nuclear Industry Strategy (CINIS)

**SONG** Yue, Senior Engineer, Institute of Nuclear Industry Strategy (CINIS)

**ZHAO** Xuelin, Engineer, Institute of Nuclear Industry Strategy (CINIS)

**ZHAO** Chang, Assistant Research Fellow, Institute of Nuclear Industry Strategy (CINIS)

**LIU** Chong, Director, Institute of International Security Studies, China Institutes of Contemporary International Relations (CICIR)

**GUO** Xiaobing, Research Fellow, Institute of International Security Studies, China Institutes of Contemporary International Relations (CICIR)

**HUANG** Meng, Deputy Researcher, Center for Strategic Studies, China Academy of Engineering Physics

**SHI** Jianbin, Deputy Researcher, Center for Strategic Studies, China Academy of Engineering Physics

**ZHU** Jianyu, Deputy Researcher, Center for Strategic Studies, China Academy of Engineering Physics

**YUAN** Xinyi, Deputy Researcher, Center for Strategic Studies, China Academy of Engineering Physics

**HAN** Hua, Professor, School of International Studies, Peking University

**WU** Jinhui, Director, China Arms Control and Disarmament Association (CACDA)

**ZHU** Xuhui, Researcher, China Arms Control and Disarmament Association (CACDA)

**TIAN** Jingmei, Researcher, China Arms Control and Disarmament Association (CACDA)

## Appendix 2. Russian Working Group

### Chair:

Anton **KHLOPKOV**, Director, Center for Energy and Security Studies (CENESS)

### Project Coordinator:

Ekaterina **PORIADINA**, Research Associate, Center for Energy and Security Studies (CENESS)

### Participants:

Sergey **BATSANOV**, Ambassador; Director (Geneva Office) and Member of Pugwash Council, Pugwash Conferences on Science and World Affairs; former Russian Ambassador to the Conference on Disarmament in Geneva

Grigory **BERDENNIKOV**, Ambassador-in-Residence, Center for Energy and Security Studies (CENESS); former Russian Deputy Foreign Minister and former Russian Governor to the IAEA's Board of Governors

Valery **BYTCHKOV**, Independent Expert; former Head of Operations Sections and the Head of Section for Effectiveness Evaluation, Department of Safeguards, International Atomic Energy Agency (IAEA)

Nikolay **KHLEBNIKOV**, Advisor, State Atomic Energy Corporation ROSATOM; Member, Standing Advisory Group on Safeguards Implementation (SAGSI); former Director of Division of Safeguards Technical Support, Department of Safeguards, International Atomic Energy Agency (IAEA)

Vladimir **KUCHINOV**, Associate Professor, Department of International Relations, National Research Nuclear University 'MEPhI'; former Advisor to the Director General, State Atomic Energy Corporation ROSATOM

Denis **SAFIKANOV**, Analyst, Centre for Analytical Research and Development (CARD), State Atomic Energy Corporation ROSATOM

Daria **SAPRYNSKAYA**, Research Fellow, Institute of Asian and African Countries, Lomonosov Moscow State University; Project Director, The Alexander Gorchakov Public Diplomacy Fund

Daria **SELEZNEVA**, Research Associate, Center for International Security, Primakov National Research Institute for World Economy and International Relations (IMEMO), Russian Academy of Sciences (RAS)

Sofya **SHESTAKOVA**, Intern, Center for Energy and Security Studies (CENESS)

Dmitry **STEFANOVICH**, Research Associate, Center for International Security, Primakov National Research Institute of World Economy and International Relations (IMEMO), Russian Academy of Sciences (RAS)

Joint Study of China Arms Control and Disarmament Association (CACDA)  
and Center for Energy and Security Studies (CENESS)

## THE AUKUS SUBMARINE DEAL: RISKS FOR THE NUCLEAR NON-PROLIFERATION REGIME AND GLOBAL SECURITY

In September 2021, Australia, the United Kingdom and the United States announced the creation of an “enhanced trilateral security partnership” called “AUKUS”. As its first initiative, the UK and the US will render assistance to Canberra in building a fleet of eight nuclear-powered submarines (SSN) for the Royal Australian Navy. Being prepared in secrecy, the establishment of AUKUS alliance came as a surprise to many. The cooperation between the three States creates new risks and challenges to non-proliferation regime and the NPT and rises many questions and concerns for international community in several dimensions, including about technological, legal, non-proliferation, and geo-strategic aspects and consequences of the deal.

*The AUKUS Submarine Deal: Risks for the Nuclear Non-proliferation Regime and Global Security* is a joint study of China Arms Control and Disarmament Association (CACDA) and the Center for Energy and Security Studies (CENESS). The report examines the main challenges of the AUKUS nuclear submarine deal to the non-proliferation regime, IAEA safeguards system, and other nuclear risks associated with the alliance, as well as ways to address them.

China Arms Control and Disarmament Association (CACDA) is a nationwide non-profitable and non-governmental organization founded in Beijing in 2001. It works to organize and promote academic research and non-governmental activities at home and abroad in the area of arms control, disarmament and non-proliferation, so as to promote international arms control and disarmament efforts for world peace and security.

The Center for Energy and Security Studies (CENESS) is an independent, nongovernmental think-tank established in 2009 and headquartered in Moscow. The main goal of CENESS is to promote unbiased, systematic, and professional analyses related to nuclear non-proliferation and nuclear energy with a special emphasis on international cooperation of Russia in these areas.

