

DISCUSSION PAPER: THE IAEA'S ROLE IN NUCLEAR SECURITY SINCE 2016

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I. INTRODUCTION

The International Atomic Energy Agency (IAEA), the key multilateral global nuclear governance body, describes itself as the “global platform” for nuclear security efforts, with a “central role” in facilitating international cooperation in the field. Long concerned with the physical protection of nuclear materials and facilities, the Agency began to ramp up its involvement in the broader issue of nuclear security after the 9/11 terrorist attacks. The series of Nuclear Security Summits, which ran from 2010 to 2016, drew high-level political attention to the threat of nuclear terrorism for the first time and boosted support for the IAEA’s nuclear security mission. The final summit, held in Washington, DC, in March 2016, lauded the Agency as “crucial for the continuing delivery of outcomes and actions from the nuclear security summits.” Participating governments agreed to a seven-page “Action Plan in Support of the International Atomic Energy Agency.”¹ Three years after the final summit seems an opportune time to assess how the Agency’s nuclear security work has fared since then. Given the complexity of the Agency’s nuclear security activities, this paper cannot provide a comprehensive assessment, but will highlight the most important nuclear security activities and the constraints and challenges the IAEA faces in fulfilling its nuclear security role.

II. THE IAEA'S NUCLEAR SECURITY MANDATE

The IAEA’s mandate in the field of nuclear security currently comprises three parts:

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¹ Action Plan in Support of the International Atomic Energy Agency, Nuclear Security Summit, Washington DC, April 1, 2016, http://static1.squarespace.com/static/568be36505f8e2af8023adf7/t/56feeb94d088e7781f9e41c/1459547833689/Action+Plan+-+IAEA_FINAL.pdf.

- 1) To contribute to global efforts to achieve effective nuclear security by establishing comprehensive nuclear security guidance and promoting its use through peer reviews and advisory services and capacity building, including education and training;
- 2) To assist in adherence to, and implementation of, relevant international legal instruments and in strengthening the international cooperation and coordination of assistance in a manner that underpins the use of nuclear energy and applications; and
- 3) To play the central role and enhance international cooperation in nuclear security, in response to General Conference resolutions and Board of Governors directions.²

These broad, overlapping, and carefully framed goals reflect the evolution of the Agency's role in nuclear security from practically zero (the term is notably absent from the 1957 IAEA Statute) to its eventual broad acceptance by Member States as a vital component of the IAEA's role in global nuclear governance. This mandate is implemented by the Division of Nuclear Security, a subdivision of the Department of Nuclear Safety and Security. The Division has four Sections: Information Management; Nuclear Security of Materials and Facilities; Nuclear Security of Materials Outside of Regulatory Control; and Programme Development and International Cooperation. The Division has approximately 80-100 staff.³

III. THE IAEA AS A GLOBAL PLATFORM FOR NUCLEAR SECURITY

Since the end of the Nuclear Security Summits in 2016, the IAEA is once again the principle international forum for discussion and debate on nuclear security. For some Member States, especially those not involved in other fora, like the Global Initiative to Combat Nuclear Terrorism (GICNT) or the Global Partnership Against the Spread of Weapons and Materials of Mass Destruction (GP), or find themselves in regions where regional collaboration is weak, the IAEA is indispensable as the only venue for political and technical engagement on nuclear security.

In addition to the annual IAEA General Conference, which has adopted increasingly detailed annual consensus resolutions on nuclear security,⁴ the Agency has established a tradition of organizing international conferences on nuclear security (ICONS) approximately every three

² IAEA General Conference, Major Program 3, Nuclear Safety and Security, IAEA Programme and Budget 2018-2019, GC(61)/4, July 2017, p. 120, https://www.legacy.iaea.org/About/Policy/GC/GC61/GC61Documents/English/gc61-4_en.pdf. These goals are rendered somewhat differently in the Nuclear Security Report 2018, GOV/2018/36-GC(62)/10, September 2018.

³ The numbers vary considerably depending on how many staff are under short-term (two-year) contracts or seconded to the Agency as cost-free experts.

⁴ For the 2018 version, see IAEA General Conference, Nuclear Security, Resolution adopted on 20 September 2018 during the 7th Plenary meeting, GC(62)RES (7 September 2018), https://www.legacy.iaea.org/About/Policy/GC/GC62/GC62Resolutions/English/gc62res-7_en.pdf.

years. These ICONS have attracted increasing attendance and support from Member States and other organizations. The conferences include a one-day ministerial meeting intended to replicate, to some extent, the higher-level interest occasioned by the Nuclear Security Summits. Thirty-four ministers attended in 2013, rising to forty-seven in 2016. Although the resulting Ministerial Declarations have not been ground-breaking, the meetings have at least kept nuclear security on the agenda of some ministers and continued to encourage states to consider new initiatives, if only as a form of national pride.⁵ The next ICONS will be convened in February 2020.

The Agency has also taken to holding technical conferences focused on specific topics within nuclear security. These events are geared more towards technical experts, including nuclear regulators, rather than diplomats and policy experts, and are not accompanied by ministerial meetings. See the table below for a list of IAEA conferences on nuclear security topics since 2013.

IAEA Nuclear Security Conferences 2013-2018			
Year	Meeting	Number of participants	Papers and posters presented
2013	International Conference on Nuclear Security: Enhancing Global Efforts (CN-203)	1,300+ participants from 125 states; 34 ministers	165 papers 55 posters
2014	Nuclear Forensics Conference (CN-218)	280+ participants from 76 Member States and 8 organizations	72 papers 42 posters
2015	International Computer Security Conference (CN-228)	700+ participants from 92 Member States and 17 organizations	152 papers 24 posters
2016	The International Conference on Nuclear Security: Commitments and Actions (CN-244)	2,100 participants from 139 states; 47 ministers; 29 organizations	314 papers 190 posters

⁵ While Russia objected to the 2016 document because it allegedly did not place enough emphasis on the prerogatives of states in ensuring nuclear security, it did not stand in the way of its adoption by consensus.

2017	International Conference on Physical Protection of Nuclear Material and Nuclear Facilities (CN-254)	Almost 800 participants from 112 states; 15 organizations	184 papers 40 posters
2018	International Conference on the Security of Radioactive Material: The Way Forward for Prevention and Detection (CN-269)	550 participants from over 100 countries and 15 organizations	202 papers 73 posters

The Agency’s conferences run like well-oiled machines, covering the myriad topics involved and providing ample opportunities for official delegations to mix with outside experts, academics, and members of civil society. Increasingly, the Agency has sought to make them more interactive, with electronic posters, specialized technical sessions, and side events. However, like other international organizations, the Agency runs up against the traditional UN conference culture that encourages formal speeches and discourages true debate.⁶ A welcome development is the Agency’s collaboration with other organizations, notably the World Institute for Nuclear Security (WINS), designed to inject novel approaches and ideas into the proceedings.

The Agency’s nuclear security conferences and technical workshops are building on one of the true legacies of the Nuclear Security Summits—the nurturing of a community of dedicated nuclear security experts, both inside and outside government. Not only is this community, collectively, increasingly aware of nuclear security risks and the appropriate responses, but individual members of the community have a growing personal vested interest in securing governmental commitment to and resources for their chosen field. A greater focus on nuclear security is especially notable in the Asia-Pacific region. There was, for example, a dramatic increase in the submission of papers by Asia-Pacific attendees at the 2016 ICONS compared to the one held in 2013, especially from Indonesia, Japan, Malaysia, and Thailand, suggesting there is a growing cadre of nuclear security experts and officials in that region.⁷ Over time, this expanding international cadre will embed nuclear security permanently in the global and domestic nuclear governance architecture, and build greater awareness and support of the IAEA’s role in nuclear security.

One of the most critical roles that the IAEA can play is to act as a global platform for exchanging information, lessons learned, and best practice. The Incident and Trafficking

⁶ One innovation for the 2016 conference was the invitation to students and young professionals to submit an essay on a topic related to the conference for review by a panel of international judges, with three winners chosen.

⁷ See Trevor Findlay, “The Asia-Pacific Nuclear Governance Architecture Part 1: Assessing the Need”, Policy Brief no. 10, Asia Pacific Leadership Network for Nuclear Non-Proliferation and Disarmament/Centre for Non-Proliferation and Disarmament, June 2017, www.apln.org.

Database (ITDB) and Nuclear Security Information Management System (NUSIMS) are key tools in this effort, as are the Agency's various meetings, workshops, training, and other networks.

Mindful of the growing number of players in the nuclear security field in recent years, the Agency has been seeking to ensure that all are aware of its activities so that duplication and waste are avoided, while cooperative and collaborative possibilities are identified. IAEA Information Exchange Meetings are held biannually for this purpose. The Nuclear Security Report in 2018 recorded that for the first time at such a meeting participating organizations and initiatives briefed attending Member States, not just each other, on their activities. This is welcome development suggests that the Agency does not regard other organizations as competing for its members' attention, but rather as collaborators in nuclear security governance.

IV. THE IAEA AS A SOURCE OF NUCLEAR SECURITY GUIDANCE

One of the most important, widely supported, and enduring roles of the IAEA in nuclear security has been the preparation and promotion of nuclear security guidance and recommendations. Published in the IAEA Nuclear Security Series, these are not legally binding, but serve as advisory documents for Member States on how to design their legal and regulatory nuclear security architectures. Full implementation of the major nuclear security treaties and codes of conduct depends on states taking IAEA guidance seriously and following it to the best of their ability. Key activities of the Secretariat involve keeping guidance documents current and relevant to emerging nuclear security challenges, with input from the Nuclear Security Guidance Committee (NSGC); ensuring that states and other stakeholders are aware of and understand the guidance; and assisting states in implementing them.

In 2017, the Agency published an implementing guide⁸ to one of the most significant IAEA nuclear security documents, Recommendations on the Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Revision 5).⁹ When the fifth revision of INFCIRC/225 was finalized in 2010, it was expected to be valid for the next ten years. One of the constraints on the guidance series is the lengthy consultations required to revise and create new versions, which may prevent the guidance from reflecting emerging

⁸ Physical Protection of Nuclear Material and Nuclear Facilities, Implementation of INFCIRC/225/Revision 5, Nuclear Security Series Implementing Guide, IAEA Nuclear Security Series No. 27-G.

⁹ At the 2014 Nuclear Security Summit in The Hague, 35 countries (two-thirds of the participants) agreed to put principles into practice by joining the "Strengthening Nuclear Security Implementation" initiative advanced by the United States, the Netherlands, and the Republic of Korea. They pledged to improve the effectiveness of their nuclear security through internal assessments and peer reviews and to acting on the recommendations. They also committed to ensuring the IAEA's voluntary guidelines are reflected in, or exceeded by, their regulations. Finally, they undertook to ensure those responsible for nuclear security are professionally certified. The document was later released by the IAEA as INFCIRC/869 (See <https://www.iaea.org/sites/default/files/publications/documents/infcircs/infcirc869.pdf>).

developments in the field, such as cyber security. For INFCIRC/225, preparations should begin soon for a new revision to encompass these developments. At its December 2018 meeting, the NSGC agreed to a process to review the top-tier documents in the Nuclear Security Series to assess whether a process should begin to revise them.

V. INTEGRATED NUCLEAR SECURITY SUPPORT PLANS

The Secretariat reports that it continues to give high priority to assisting states develop and implement Integrated Nuclear Security Support Plans (INSSPs), which help states take a comprehensive approach to enhancing their domestic nuclear security regimes.¹⁰ The plans are drafted and approved by states with the assistance and advice of the Secretariat. INSSPs are a response to the obvious need to increase coordination between the Agency, the state concerned, and potential donors to ensure that the resources available from a variety of sources are used effectively and efficiently, especially to avoid duplication. A revised template for INSSPs was issued in April 2017 in response to Member State requests.

As of June 2018, 79 states were implementing approved INSSPs, 19 draft INSSPs were awaiting acceptance by the state concerned, and three were awaiting finalization. In 2017-2018, the Agency held 23 INSSP review meetings and three finalization meetings, as well as regional and technical meetings of INSSP Points of Contact (PoCs).¹¹ INSSPs are valuable contributions to strengthening domestic nuclear security architectures, but fewer than half of the IAEA membership of 170 states has adopted them. Paradoxically, states with sophisticated nuclear enterprises do not see the need for IAEA involvement in planning their nuclear security regimes, believing they have everything under control, while states with modest nuclear capabilities see no need for planning because they have so little to account for. The Secretariat is making some scrubbed data about INSSPs available to Member States to demonstrate the success of the program and encourage more funding. But a wider effort to publicize the advantages of INSSPs is warranted.

VI. PEER REVIEW AND ADVISORY MISSIONS

There has been a long-term trend of increased demand for IAEA advisory missions, undoubtedly a reflection of heightened awareness among states of the importance and value of such advice and assistance.

International Physical Protection Advisory Services

International Physical Protection Advisory Services (IPPAS), created by the IAEA in 1995, provide peer advice at the request of a state on implementing international instruments and

¹⁰ Nuclear Security Report 2018, GOV/2018/36-GC(62)/10, pp. 1-2.

¹¹ PoCs, which are nominated by each state participating in a particular IAEA activity, are an invaluable way for the Agency to keep track of who to contact, at least in the first instance, within a member state's bureaucracy. Meetings of PoCs have become a useful way to build expert communities and enhance cooperation and information sharing.

Agency guidance on the protection of nuclear and other radioactive material and associated facilities and activities. IPPAS missions are co-ordinated by the Agency and conducted by teams of international nuclear security experts. Their scope is determined by the requesting state. The findings of IPPAS missions are reflected in confidential mission reports. Missions may be complemented by a follow-up visit and IAEA assistance.

Since 1996, the IAEA has conducted 84 missions, including follow-up missions, in 50 states.¹² On average, the Agency carried out 3.6 missions per year between 1996 and 2016.¹³ Since 2016, when a record six missions were carried out, the annual number of missions has declined to four. Yet, there has been increasing demand, including among smaller Member States with no reactors or nuclear material, but only radioactive sources. Less than one-third of the Agency's Member States have hosted an IPPAS mission.

A persistent barrier to increasing the number of IPPAS missions has been finding enough qualified experts to participate. In October 2017, the Agency hosted a third workshop aimed at increasing the numbers of experts available.¹⁴ Others have suggested a certification system for IPPAS expert participants, which although valuable in ensure the quality of participants may further restrain the number of missions that can be fielded.¹⁵ The Agency has also established a database of best practices identified in past missions, which is a useful way of extending their benefits to all states. Regional workshops are now convened to provide information to potential mission recipients on preparing for and conducting IPPAS missions and the benefits to be derived from them. Because missions in smaller states with few facilities and small amounts of material only take around three days, rather than a week or more in the case of larger states, the overall impact of IPPAS could be increased by encouraging smaller states to host missions.

Another challenge to achieving the full potential of IPPAS is that the missions are voluntary. Despite the benefits both to states that receive them and to overall confidence in global nuclear security, no norm has emerged that would make IPPAS missions customary. Some of the larger states continue to decline to take advantage of IPPAS missions, presumably because they feel confident in their ability to manage their own nuclear security and due to national security concerns.

Although the results of IPPAS missions are confidential, there would be great benefit from more Member States voluntarily publishing a redacted version of IPPAS reports. This could help build confidence in their nuclear security commitments and allow other states to learn

¹² Nuclear Security Report 2018, GOV/2018/36-GC(62)/10, p. 8.

¹³ Nuclear Security Governance Experts Group (NSGEG), "International Nuclear Security Peer Reviews: Making the IAEA IPPAS General and Sustainable", November 2016, p. 5.

¹⁴ The Third International Workshop on IPPAS for Potential Team Members of Future IPPAS Missions, October 2017, Vienna.

¹⁵ Nuclear Security Governance Experts Group (NSGEG), "International Nuclear Security Peer Reviews: Making the IAEA IPPAS General and Sustainable," November 2016, p. 8.

from their experience.¹⁶ Publication of a redacted version would provide these benefits without revealing confidential information.

International Nuclear Security Advisory Service

International Nuclear Security Advisory Service (INSServ) missions, also conducted by international teams of experts, evaluate a state's nuclear security legal and regulatory regime using the IAEA Nuclear Security Series as a basis. The team suggests improvements and acknowledges best practices, while hopefully also identifying bad ones, in a confidential report. New INSServ guidelines were drafted in 2018 and once approved by Member States will be implemented by both team members and the host country during the 2018-2019 IAEA reporting year.¹⁷ The new guidelines are intended to ensure that INSServ missions are compatible with, and complementary to, IPPAS missions.¹⁸ Yet it is not clear what the demand for INSServ missions is. Forty-one were completed between 2002 and 2011, at about the same rate as IPPAS missions.¹⁹ But none are mentioned in the 2018 Nuclear Security Report and the Agency's INSServ calendar on its website is bare.²⁰ The Agency gives much more prominence to IPPAS missions compared to INSServ missions, even though the latter may ultimately be more valuable in establishing the broad parameters for a state's national nuclear security regime.

VII. CONVENTION ON THE PHYSICAL PROTECTION OF NUCLEAR MATERIAL

One of the most important developments in the global nuclear security architecture since the last Nuclear Security Summit has been entry into force in May 2016 of the Amendment to the Convention on the Physical Protection of Nuclear Material (CPPNM). The CPPNM, as amended, now covers the protection of all nuclear material in a state from theft, not just material in international transit, as well as the protection of nuclear facilities from sabotage. As the depositary for the amended CPPNM, the IAEA has a significant opportunity to shape the treaty regime, not just through its convening powers, but its ability to influence agendas and practices. Most importantly, under Article 16 of the amended CPPNM, the IAEA is charged with organizing a review conference five years after its entry into force, which will be in 2021. The IAEA began convening annual treaty Point of Contact meetings in 2015, with

¹⁶ Some states, including Australia, Canada, Hungary, and the Netherlands, have published redacted versions of their IPPAS mission reports. For Australia's 2017 report, see: <https://dfat.gov.au/international-relations/security/asno/Documents/2017-ippas-follow-up-mission-report.pdf>.

¹⁷ Nuclear Security Report 2018, GOV/2018/36-GC(62)/10, p. 11. There is a Peer Review and Advisory Services Committee (PRASC) responsible for reviewing all IAEA review and advisory services. See https://gnssn.iaea.org/main/PRASC/Pages/PRASC_details.aspx.

¹⁸ United Nations Disarmament Yearbook 2015, Part 2, United Nations, New York, 2016, p.

¹⁹ IAEA Nuclear Security Achievements 2002-2011, March 2012, p. 15.

²⁰ See Nuclear Security Report 2018, GOV/2018/36-GC(62)/10, p. 11. None are listed on the IAEA Peer Review and Advisory Services calendar going back as far as 1987, IAEA Peer Review and Advisory Services Calendar, <https://www.iaea.org/services/review-missions/calendar?page=15>: accessed 30 January. 2019.

participation from approximately 50 States Parties. These one to two-day meetings are of a technical nature, but provide a useful additional forum for discussion on nuclear security.²¹

Despite its role as depositary for the CPPNM, and the responsibilities that come with it, the IAEA has not been active in promoting itself as a key player. Its 2018 annual report relegates work to convene the review conference to a section titled “Promoting further adherence to international legal instruments,” which minimizes the significant undertaking in preparing and hosting for a major international event. The IAEA could take the opportunity to promote an ambitious and creative review conference that would reap the most benefit for itself and its Member States. The Agency convened an informal meeting of parties in December 2018, attended by 50 States Parties to the amended convention (10 States Parties to the original CPPNM also attended as observers). A provisional roadmap for preparing for the Review Conference was presented. In addition, Expert Meetings involving legal and technical experts will be convened, with the first to be held in July 2019. A formal Preparatory Committee meeting is scheduled for June 2020.

The Agency meanwhile is doing good work in encouraging adherence to the amended CPPNM, facilitating information exchanges, including through PoC meetings, and assisting states in developing their national legislative and regulatory frameworks. Regional workshops are also being held, so far in Southeast Asia, French-speaking Africa, and Russian-speaking states. In 2019, an international seminar will be held for parties to the CPPNM that are not IAEA members or which do not have diplomatic representatives in Vienna. All of these activities bolster the CPPNM regime and the IAEA’s role in nuclear security.

VIII. SECURITY OF RADIOACTIVE SOURCES

Nuclear security challenges for most states arise not from nuclear power plants, weapons-usable nuclear material, or other elements of the nuclear fuel cycle, but from radioactive sources. The IAEA’s increasing emphasis on the security of such sources is therefore vital, not only for its potentially substantive impact, but because it promises to draw all states into the nuclear security enterprise and give them a stake in its success. The Agency’s work in this field encompasses guidance development; assistance to Member States, including training courses and expert advice; the fostering of continued dialogue between states; and support for the Code of Conduct on the Safety and Security of Radioactive Sources.²² In addition, the Agency’s work to tackle the problem of nuclear and other radioactive materials out of regulatory control has specific value for most countries due to the ubiquity of orphaned radiological sources.

²¹ Nuclear Security Report 2018, GOV/2018/36-GC(62)/10, p. 16.

²² Code of Conduct on the Safety and Security of Radioactive Sources, https://www-pub.iaea.org/MTCD/publications/PDF/Code-2004_web.pdf.

As of September 2018, 137 states had made a political commitment to implement the Code of Conduct (just five more than in June 2016).²³ Of these, 114 had notified the Director General of their intention to act in a harmonized manner in accordance with the Code's supplementary Guidance on the Import and Export of Radioactive Sources (compared to 105 in June 2016).²⁴ Only eight had given a similar notification regarding the supplementary Guidance on the Management of Disused Radioactive Sources, which had been approved by the General Conference in September 2017 after several years of discussion and drafting.²⁵ Despite almost all countries having, at a minimum, a hospital that uses radiological sources for x-rays, less than two-thirds of the IAEA's members have committed themselves to the Code, despite it being voluntary and non-legally-binding. Clearly, more work needs to be done to universalize respect for the Code and the supplementary guidance.

IX. EDUCATION AND TRAINING

The IAEA has traditionally been involved in providing training on a range of nuclear-related topics, including nuclear security. Increasingly, the Agency has realized that the demand for face-to-face nuclear security training, whether in-house or outsourced to Member States, is far outstripping demand. The IAEA has supplemented its existing nuclear security training since 2010 by developing an extensive e-learning capacity (currently 16 modules).²⁶ In 2017-2018, there were 877 users from 104 states who completed 3,681 e-learning modules, with the transport module the most popular.²⁷ The overall completion rate, resulting in certificates, was 80%. New modules are planned on information and computer security and on identification of insider threats. By 2021, the Secretariat plans to provide its e-learning modules in all official UN languages and in Korean.

The Secretariat is aware, however, of the pitfalls of e-learning, including low completion rates, uncertain knowledge-retention rates, and the difficulty of sustaining the learning process. It cautions that e-learning is meant to supplement, not replace, face-to-face learning, although it can be successfully used as a pre-requisite for classroom learning.

The IAEA is also trying to incorporate new technology into face-to-face training. In May 2017, the IAEA piloted a new interactive three-dimensional (3D) model of a hypothetical research facility, the Shapash Nuclear Research Institute, in its training course on Preventive

²³ <http://www-ns.iaea.org/downloads/rw/imp-export/status-list.pdf>. For 2016 figures see Nuclear Security Report 2016, GOV/2016/47-GC(60)/11, p. 2,

https://www.legacy.iaea.org/About/Policy/GC/GC60/GC60Documents/English/gc60-11_en.pdf.

²⁴ Guidance on the Import and Export of Radioactive Sources, https://www-pub.iaea.org/MTCD/Publications/PDF/8901_web.pdf.

²⁵ Guidance on the Management of Disused Radioactive Sources, https://www-pub.iaea.org/MTCD/Publications/PDF/Guidance_on_the_Management_web.pdf.

²⁶ See Nuclear Security E-Learning, <https://www.iaea.org/topics/security-of-nuclear-and-other-radioactive-material/nuclear-security-e-learning>. Presentation by Tim Andrews, International Conference on Physical Protection of Nuclear Material and Nuclear Facilities, Vienna, 13-17 November 2017.

²⁷ Nuclear Security Report 2018, GOV/2018/36-GC(62)/10, p. 17.

and Protective Measures against Insider Threats.²⁸ The model is designed to enhance realism and skills development. The Agency is also using live polling in many of its courses and conference sessions to encourage greater engagement with participants.

The Agency has increasingly recognized that, beyond technical training, there is a worldwide shortage of nuclear security education at the tertiary level. The Agency has sought to help address this lacuna through its International Nuclear Security Education Network (INSEN). Currently comprising 170 institutions from 62 states, INSEN has been successful in assisting Member States establish and enhance domestic educational programs based on international guidance and recommendations, and in helping produce packages of teaching materials and textbooks.²⁹

Nuclear Security Support Centres

A relatively recent development has been the advent of National Nuclear Security Support Centres (NSSCs) or Centres of Excellence (CoEs) in Member States. In 2012, the Agency inaugurated its Nuclear Security Support Centres Network to facilitate sharing of information and resources and enhance coordination and collaboration among NSSCs/CoEs. The network now has 60 participating Member States and holds annual meetings. The Asia-Pacific region has been particularly active in setting up such centres, with China, India, Indonesia, South Korea, and Japan each hosting one. Some NSSCs/CoEs have also extended their reach to involve participants from states within their region. Cooperation between centres and regional participation in centres not only promises to enhance nuclear security but may reduce suspicions about the national security implications and sensitivity of working cooperatively on nuclear security. This may pave the way for further collaboration and confidence-building activities. Cooperation between China, Japan, and South Korea has been particularly notable, despite other difficulties in their relationships. The IAEA has also started hosting its annual NSSC meetings outside Vienna, enabling participants to visit other NSSCs and share best practice. The Agency is also encouraging the NSSCs to establish train-the-trainer schemes to permit faster dissemination of knowledge and experience.

Geographically, the spread of NSSCs and CoEs is uneven. While Asia/Pacific is well catered for, Africa, Latin America, the Caribbean, and the Middle East are less so. The Agency could play a key role in rectifying this disparity by exposing more of its membership to the benefits of such centres and fostering regional centres in parts of the world where individual countries are unable to set up their own.

²⁸ See A. Askin, Hypothetical Nuclear Facility Interactive Training Tool to Support Practical Application of Nuclear Security Skills, Lawrence Livermore National Laboratory, LLNL-CONF-752430, June 4, 2018.

²⁹ Full disclosure: the author is a member and has been impressed by the organization and continued evolution of INSEN.

X. SUPPORT FOR REPATRIATION OF NUCLEAR MATERIAL

Absent from the annual Nuclear Security Report, presumably because it is not handled by the Division for Nuclear Security, but by the Division of Nuclear Fuel Cycle and Waste Technology,³⁰ is the Agency's assistance in repatriating highly enriched uranium (HEU) from nuclear research reactors worldwide to the material's country of origin. Globally, almost 100 research reactors using HEU have been converted to low-enriched uranium (LEU). The two main IAEA roles of central coordinator and provider of support have been described as indispensable.³¹

In 2017, the Agency assisted in the repatriation from Ghana of the first Chinese-supplied material; in 2018, it helped repatriate HEU from Nigeria to the United States, rendering Africa free of HEU-fuelled research reactors.³² In publicizing such efforts, the IAEA tends to treat them as technical matters rather than achievements in enhancing global nuclear security and permanent threat reduction, presumably to avoid implying that the states concerned were ever a nuclear security risk. However, given the prominence that such activity achieved in the Nuclear Security Summit process and the impression in some quarters that the IAEA is not involved in such practical measures, the Division of Nuclear Security would benefit from incorporating such progress in its reports and highlighting its importance in the context of nuclear security. This underscores the need for better internal coordination within the Secretariat to promote the Agency's achievements.

XI. THE SAFETY/SECURITY NEXUS

There is increasing recognition by the IAEA that nuclear safety and security are inextricably linked. The fact that safety and security are under one IAEA department—the Department of Nuclear Safety and Security—and one Deputy Director General is positive in stressing that nexus. Some initiatives are deliberately designed to involve both safety and security. A network that admirably straddles both nuclear safety and nuclear security is the IAEA Global Nuclear Safety and Security Network (GNSSN).³³ An International Conference on the Challenges Faced by Technical and Scientific Support Organizations (TSOs) in Enhancing Nuclear Safety and Security: Ensuring Effective and Sustainable Expertise, was held in Brussels in October 2018, in cooperation with the Belgian government.³⁴ Encouragingly, the

³⁰ The then-Nuclear Security Section did handle some HEU removals in 2015/2016.

³¹ A. Atkins, U.S. Department of Energy, Presentation to main panel session, CPPNM/A: International Cooperation for Physical Protection of Nuclear Material and Nuclear Facilities, 17 November 2017.

³² Nigeria converts its HEU research reactor to LEU fuel, IAEA Press Release, 20 December 2018, <https://www.iaea.org/newscenter/news/nigeria-converts-its-research-reactor-from-heu-to-leu-fuel>

³³ See <https://gnssn.iaea.org/main/pages/default.aspx>.

³⁴ <https://www.iaea.org/events/challenges-faced-by-technical-and-scientific-support-organizations-conference-2018>

Advisory Group on Nuclear Security (AdSec) and the International Nuclear Safety Advisory Group (INSAG) are also seeking to collaborate on joint projects.³⁵

However, the Agency's approach to the safety and security nexus is not always consistent. The meeting of the Regulatory Network (RegNet) Steering Committee on Regulatory Capacity Building and Knowledge Management, held in December 2018, heard Juan Carlos Lentijo, Deputy Director General for Nuclear Safety and Security, rightly assert that "Qualified staff are the backbone of countries' ability to uphold national responsibility for nuclear safety and security."³⁶ Yet the Agency concluded that the meeting's results would contribute to development of its Strategic Approach to Education in Training in Nuclear Safety, with no mention of security. The Agency's annual Nuclear Security Reports, meanwhile, appear to be compilations of work descriptions from each section of the Nuclear Security Division, without considering what other Agency activities might contribute to nuclear security. Obvious examples are the repatriation of HEU and the IAEA's Incident and Emergency Response system. The Regulators Network (RegNet) itself appears to comprise nuclear safety regulators only. There is no comparable body for nuclear security regulators. Consideration should be given to setting up a forum for nuclear security regulators, as well as initiating contacts between such a forum and RegNet.

There needs to be a continuing effort to ensure that safety and security are considered holistically whenever possible. One challenge is that while safety and security fall under different divisions at the IAEA, Member States have a variety of domestic arrangements. Some combine safety and security (and sometimes even safeguards) in the same office, while others strictly separate safety and security, often applying much stricter confidentiality and even secrecy arrangements to the latter. Some, like Australia, Canada, and Germany, have federal structures that complicate domestic jurisdiction over nuclear safety and security. While the IAEA is unable to change Member States' domestic arrangements, it must ensure that its own organizational arrangements are sufficiently flexible and its staff sufficiently aware to cope with the diversity of its Member States.

XII. MANAGEMENT AND BUDGET

As in other areas of the Agency's work, the Division of Nuclear Security is opaque about its management and financial challenges.³⁷ Details must be ferreted out from other Agency documents. Greater transparency would help make the case for greater political and financial support for the program. As the Agency itself says, "Dialogue with Member States

³⁵ Nuclear Security Report 2017, GOV/2017/31-GC(61)/14, 25 July 2017, p. 7.

³⁶ "IAEA says national strategies needed for regulatory competence", World Nuclear News, 3 January 2019, <http://www.world-nuclear-news.org/Articles/National-strategies-needed-for-regulatory-competen>.

³⁷ Although there is a heading called "Programme management and resources" in the IAEA's annual Nuclear Security Report, the section consists of just two short paragraphs dealing with expenditures and contributions to the Nuclear Security Fund (NSF).

and other relevant organizations needs to be maintained to increase awareness of the Agency's central role in facilitating the strengthening of global nuclear security."³⁸

Management

While there is no public evidence that the Division of Nuclear Security is managed less effectively and efficiently than the rest of the Agency, Canada has suggested a review by the IAEA's Office of Internal Oversight Services (OIOS) of the technical assistance provided to states in the nuclear security field. Technical cooperation projects are always difficult to manage, as donor governments have repeatedly discovered. An international organization like the IAEA has its own unique challenges in ensuring project relevance, compatibility with national development goals, and sustainability. The proposed review has been postponed for unknown reasons but should be revived. In 2016, in response to internal audit criticism of project management, the Secretariat did develop procedures for implementing complex projects.³⁹ Staff received training in the new procedures and pilot projects were identified to validate them. No further information has been included in the annual nuclear security reports about how such reforms fared.

A management challenge shared by all parts of the IAEA Secretariat is the focus on quantitative rather than qualitative metrics of success, as the former is easier and involves less judgement. This inhibits proper risk assessment and reviews of project performance. Recipient and donor states need to know not just how many IPPAS missions have been conducted, how many radiation monitors have been installed at border crossings, or how many states have a recommended Design Basis Threat in place, but what the impact has been on nuclear security.

After evaluating the sub-program on Management of Spent Fuel from Nuclear Power Reactors in the Department of Nuclear Energy (NE), the Agency's external auditors⁴⁰ noted in 2018 that the IAEA's planning process is "mostly on the programme and budget elements of the programme and does not include planning for a monitoring and performance assessment strategy."⁴¹ In fact, the Agency has no formal guidelines for monitoring and performance assessment. The auditors recommended an interconnected Risk Management process at Agency-wide and project level to allow sub-programme management (nuclear security is a sub-program) to improve operational risk identification, and risk mitigation planning "in a visible and trackable manner."⁴² The Agency agreed with the recommendation and undertook to implement it. One challenge to doing so is the reluctance of Member States to provide information to the Agency on the impact of its

³⁸ IAEA 2018-2019 Programme and Budget, GC(61)/4, p. 119.

³⁹ Nuclear Security Report 2016, GOV/2016/47-GC(60)/11, p. 19, https://www-legacy.iaea.org/About/Policy/GC/GC60/GC60Documents/English/gc60-11_en.pdf.

⁴⁰ The Audit Board of the Republic of Indonesia

⁴¹ The Agency's Accounts for 2017, August 2018, p. 160, https://www-legacy.iaea.org/About/Policy/GC/GC62/GC62Documents/English/gc62-5_en.pdf.

⁴² The Agency's Accounts for 2017, p. 160.

projects, perhaps due to embarrassment at the mixed results or, in the case of nuclear security, deeply ingrained national security concerns.⁴³ The Secretariat and supportive Member States need to continually make the case that transparency about nuclear security can be increased to enhance collaboration and cooperation without compromising national security.

Budget

The Agency's nuclear security work is constrained by its unusual financing arrangement and little has changed since 2016. Unlike other Agency programs, the regular budget allocation for nuclear security, Programme 3.5 (Nuclear Safety and Security are both housed under Programme 3), is largely devoted to the management of the Division of Nuclear Security, which administers the Agency's nuclear security activities. Around 80% of the substantive work in fulfilling the three parts of the Agency's nuclear security mandate is funded by the Nuclear Security Fund (NSF) comprising voluntary, extra-budgetary contributions from Member States. This is a legacy of a time when there was disagreement among Member States, since largely resolved, about whether nuclear security was a core function of the Agency.

In 2017, financial pledges to the NSF amounted to €44.1 million from 16 Member States and the European Commission.⁴⁴ Extra-budgetary spending that year for nuclear security, mostly from the NSF, was approximately €26.5 million, meaning that the NSF continues to grow rather than being depleted.⁴⁵ Member State contributions to the NSF have grown annually since 2016, indicating hearty support for the Agency's nuclear security mandate.

The difficulty is that not all Member States are sharing the burden, creating two classes: donors and recipients. It suggests that nuclear security is a concern only of developed countries. This is not healthy for the long-term "ownership" of the nuclear security challenge and the sustainability of efforts to deal with it. Financial constraints on major donors and donor fatigue can imperil the Agency's work at short notice. A further constraint is the tendency of donors to place conditions on their contributions, such as directing them to particular activities, projects, states, or regions. As the Agency puts it, "... resources from the Regular Budget are insufficient to meet all the requests for support, and implementation of the Programme will continue to be dependent on Nuclear Security Fund contributions and conditions attached to those contributions."⁴⁶ Such conditions complicate planning, management, personnel recruitment and retention, and long-term risk assessment. Staff funded by the NSF are limited to two-year contracts, resulting in an absence of long-term

⁴³ The Agency's Accounts for 2017, p. 161.

⁴⁴ IAEA Annual Report 2017, p. 85, <https://www.iaea.org/sites/default/files/publications/reports/2017/gc62-3.pdf>.

⁴⁵ IAEA Annual Report 2017, p. 115, <https://www.iaea.org/sites/default/files/publications/reports/2017/gc62-3.pdf>.

⁴⁶ IAEA 2018-2019 Programme and Budget, GC(61)/4, p. 119.

commitment, a rapid staff turnover, and loss of institutional memory and experience. Cost-free experts provided by Member States are there at the whim of the government concerned, again constraining long-term planning.

The estimated increase in regular budget spending on nuclear security for 2018 was 6%,⁴⁷ an impressive figure in a continuing era of zero real budgetary growth at the Agency. This increase demonstrates a growing recognition of the need to regularize the budget of the Division of Nuclear Security, and may provide more stability for planning and implementing activities in the coming year. Since the Division of Nuclear Security is part of the Department of Nuclear Safety and Security, it also benefits from increased Departmental funding, as it shares some common services, including managerial oversight.⁴⁸ In addition, the Department's regular budget in 2018 included increased spending of benefit to both nuclear safety and nuclear security: the strengthening of radiation monitoring services and the capacity of national radiation safety and nuclear security regulators. Extra funding was also helpfully included for the regularization of positions in the Division of Nuclear Security to help address over-reliance on cost-free experts from Member States.⁴⁹ Finally, 12% of the Department's budget goes to Incident and Emergency Preparedness and Response, which is applicable both to nuclear accidents and nuclear security incidents.⁵⁰

XIII. PLANNING, PRIORITIES AND PROMOTION

IAEA Nuclear Security Plans

The Nuclear Security Plans (NSPs), the first of which was launched in 2001, are meant to guide the IAEA's nuclear security activities for the coming four years.⁵¹ A comparison of the plans since 2001 reveals increasing length, detail, specificity, and utility, suggesting growth in the scope and depth of the Division of Nuclear Security's responsibilities.

The current NSP, for 2018-2021,⁵² has several welcome innovations. First, the "performance indicators" of previous plans have been discarded in favour of "planned outputs" and a

⁴⁷ GC(61)/4, p. 23

⁴⁸ The Division of Nuclear Security has a 10% share of the regular budget allocation for the Department of Safety and Security, which funds both the Division of Nuclear Security and the Division of Nuclear Safety, in addition to the management and administrative costs that are included in the 11% of the Department's budget that goes to "overall management, coordination and common activities." In 2018, the regular budget for the Department of Nuclear Safety and Security was increased by 1.3% over 2017 to €35.6 million and in 2019 to €36.2 million. See The Agency's Budgetary Update for 2019, GC(62)/2, p. 3, https://www-legacy.iaea.org/About/Policy/GC/GC62/GC62Documents/English/gc62-2_en.pdf.

⁴⁹ IAEA Programme and Budget 2018, GC(61)/4, p. 2.

⁵⁰ GC(61)/4, p. 22.

⁵¹ The NSPs are adopted by the General Conference after preparation by the Secretariat, drawing on General Conference and Board of Governors resolutions, the assessed needs of the Division of Nuclear Security, consultations with member states, including via the Advisory Group on Nuclear Security (AdSec), and, more recently, the Ministerial declarations issued at the ICONS.

⁵² IAEA General Conference, Nuclear Security Plan 2018-2021: Report by the Director General, GC(61)/24, 14 September 2017.

more qualitative approach to measuring implementation of the NSP.⁵³ Second, the NSP seems more attuned to the expressed priorities of Member States, especially their increased interest in cyber security, insider threats, and security culture. Third, the NSP has begun to recognize the cross-cutting nature of many aspects of nuclear security, notably computer security.

A fourth significant change in the 2018-2021 NSP is its restructuring to replicate that of the Division of Nuclear Security and the nuclear security part of the Agency's biennial Programme and Budget known as Major Programme 3.5. The 2018 Nuclear Security Report, which records the Agency's nuclear security activities for the past year to the Board and General Conference, for the first time followed the same structure as well. The new consistency is welcome in linking all the activities proposed in the NSP to the necessary programming and budget to support them, whether this comes from the regular budget or voluntary contributions to the Nuclear Security Fund. Previous NSPs seemed unmoored from the availability of resources to implement them, ignoring the reality that it is the allocation of funding based on the annual budgetary discussions that determines Agency priorities, not the NSP. Consistency between the NSP and the regular budget is also vital for Member States and other stakeholders seeking to understand the Agency's nuclear security work. Smaller developing countries with few staff available to fathom the complexities of IAEA programs and documents especially welcome these changes.

While recognizing the difficulty of neatly categorizing the IAEA's sprawling nuclear security activities, it is in the Agency's interest that they be readily understood and communicated, especially because most activities are dependent on voluntary financial and in-kind contributions.

Internal planning

Unlike the Department of Safeguards, the Division of Nuclear Security does not have an internal strategic plan to establish its current priorities, determine methods of assessing risks to its activities, and lay the groundwork for considering emerging developments in nuclear security. The NSP, developed in consultation with Member States, does not establish priorities among the activities it outlines. The Programme and Budget documents, the Agency's Annual Reports, and the annual Nuclear Security Report do typically mention some priorities, but they are often different from each other, variously characterized, or inconsistent. The 2018 Nuclear Security Report appears to prioritize convening conferences, including, understandably, the 2021 CPPNM review conference. While conferences are excellent vehicles for nurturing an international nuclear security community, they should be a means to an end, not ends in themselves. There are other obvious priorities that could be established, such as encouraging every state to host an IPPAS and/or INSServ mission by

⁵³ Performance indicators for nuclear security remain in the biennial Programme and Budget, as they do for all other IAEA programs.

2021 or setting a goal of 20 such missions every biennium.⁵⁴ A Divisional strategic plan could be invaluable in determining real priorities, assessing risks to global nuclear security, and framing the Agency's approach to its role in dealing with such risks.

Assessment of the impact of the nuclear security program is also missing in Agency reports on its work. The application of results-based management throughout the IAEA has led to quantitative metrics of success at the expense of qualitative ones. Feedback from Member States on the impact of Technical Cooperation projects or other assistance in nuclear security is absent. Reports also fail to mention management, staffing and funding challenges, apart from the difficulties posed by voluntary contributions. For instance, they could identify whether the Secretariat is able to recruit enough technical experts or whether it is still too reliant on seconded experts from certain Member States.⁵⁵ More transparency about management and funding challenges could strengthen interactions with donors and ensure that both Member States and the IAEA can appropriately implement NSF spending.

The bureaucratic and budgetary complexity of the Agency's nuclear security work makes it difficult to neatly describe the Agency's overall contribution to nuclear security. This in turn poses challenges for promoting the program's value to Member States and other stakeholders. The Agency's longstanding "One House" campaign—to have the Agency's programs act in a coordinated and united fashion and promote internal transparency—continues to be bedevilled by a tendency towards "stove-piping." A renewed effort is necessary, led by the top leadership of the Agency, to cultivate a culture of openness and "need to share."

XIV. CONCLUSION AND RECOMMENDATIONS

The IAEA is demonstrably growing and strengthening its role in enhancing nuclear security. Since 2016, it has become more visible as the principal forum for international dialogue on nuclear security matters, expanded its educational and training role, and sought to meet increasing demand from states for its advice and services. It has adopted innovative approaches in several areas, including e-learning, university-level nuclear security education, and global networking. Importantly, it is contributing to the rapid expansion of a permanent, informed global nuclear security community.

Yet, it could achieve much more if its mandate was more unequivocal. The Board of Governors could take the initiative to update the IAEA's nuclear security mandate to something like "enhance global nuclear security in a comprehensive and sustainable fashion" and do everything that derives from that mandate. More cohesive and logical strategic planning could flow from such a development. Even without a clarified mandate, the Agency should adopt enhanced strategic planning, risk assessment, and prioritization to

⁵⁴ A model that could be emulated is the goal of the World Association of Nuclear Operators (WANO) to have each nuclear power plant in the world subjected to a nuclear safety peer review.

⁵⁵ The IAEA Secretariat no longer provides a separate report on staffing to the annual General Conference.

its nuclear security work, as well as encouraging feedback from recipients of its advice and technical assistance.

Increased transparency about and promotion of the Agency's nuclear security plans, activities, funding, and outcomes would encourage greater budgetary allocations and more voluntary funding. Resources should be allocated, including to the Division of Nuclear Security, for such transparency and promotional purposes. Likewise, providing a comprehensive report on the Agency's contribution to nuclear security, whether carried out by the Division of Nuclear Security or other divisions, should encourage a greater appreciation of the Agency's role among member states and other stakeholders. Altogether indispensable, the IAEA's role in nuclear security needs to be enhanced and much more widely promoted and appreciated.



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