Chapter 11

The IAEA for Building Future Safeguards Capabilities

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Mission—The IAEA’s verification mission for non-nuclear weapons states is derived from the Nuclear Non-Proliferation Treaty. That mission is a simple one: to verify—through the application of safeguards—that nuclear material within the territory, jurisdiction, or control of a non-Nuclear Weapons State is not diverted to nuclear weapons or other nuclear explosive devices. Our role is clearly defined in our statute and in legally binding safeguards agreements with States. We operate within boundaries largely determined by our Board of Governors - to provide a unique service to the international community.

Deterring the proliferation of nuclear weapons depends very much on the robustness of the verification regime. Essentially, there are three elements to a robust verification regime. First, for Member States to provide the IAEA with accurate and consistent declarations of their nuclear material and facilities. Second, having effective safeguards measures available. And third, having the will to apply them without fear or favour.

Verifying the non-diversion of nuclear material at declared nuclear facilities is an important element of that regime, but is not sufficient. Any determined proliferator is unlikely to conduct nefarious activities where inspectors regularly inspect. That is why we also need to provide credible assurance of the absence of undeclared nuclear material and activities. While the Agency has the “right and obligation” under Article 2 of the CSA to ensure that safeguards will be applied... on all source of special fissionable material in all peaceful activities”—that is “Completeness”: the Additional Protocol provides complementary legal authority that strengthens the Agency’s ability to detect undeclared nuclear material and activities. It is only for States with both a CSA and AP in force that the Agency is able to conclude that all nuclear material remains in peaceful activities in the State. And that is why the

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additional protocol is vital in strengthening the verification regime, by providing us with additional information and broader access to sites and locations.

The work of our inspectors—backed by analysts and technical support staff in Vienna—continues every day across the world. Sustaining that global operation requires resources, commitment and capability. Here, I want to stress that it is our legal obligation to implement safeguards—it is not a matter of choice. Our legal obligations determine our workload, and our workload continues to increase while our budget broadly remains the same.

Challenges—While the core safeguards mission does not change, the world in which we operate does. When coupled with increasing demand on safeguards services, this means we need to adapt in order to sustain the credibility of the safeguards system.

Alongside the steadily rising number of nuclear facilities and locations outside facilities that are under safeguards—currently over 1300—in recent years we have also seen a significant growth in the number of Additional Protocols in force—around 40 in the past decade—to now stand at 134. As you are aware, the additional protocol gives the Agency broader access to information about all parts of a State’s nuclear fuel cycle, including research and development activities, as well as the manufacturing and export of sensitive nuclear-related equipment and material.

The volume and diversity of safeguards-relevant information is growing rapidly. More Additional protocols in force means more Additional Protocol declarations to be checked. Open source information grows exponentially, thereby increasing the demands on analysts to keep pace and to identify the most relevant information.

The Agency now conducts more complicated verification activities than ever in the past, to keep pace with the nuclear fuel cycle developments of States under safeguards. For example, today there are a lot more spent fuel transfers to medium and long-term storage and more decommissioning of facilities than previously.

Globalization, new technology and modern communications have all made it possible to access technologies, materials and expertise that were previously not widely available. Technology that could be used for the development of nuclear weapons is no longer out of reach for a growing number of States.

And advancements in information technology have heightened cyber security threats to the protection of sensitive information that has been provided to the IAEA—in confidence—by Member States.

Meeting the challenges—So, how is the IAEA and more particularly the Department of Safeguards responding to the challenge of adapting to change in the context of rising demand and a tightly constrained budget? Let me set out some of the ways in which we are seeking to do so.

Let me start with State-level safeguards.

State-level safeguards approaches (SLAs) are a very important tool to improve the effectiveness of safeguards. They also enable the Agency to better cope with a fast changing environment because, unlike the Safeguards Criteria, they can respond to changes in State-specific factors, such as changes to a State’s nuclear fuel cycle. In other words, the frequency and intensity of safeguards measures can be adjusted in line with changes to those factors. SLAs, developed based on detailed procedures

and defined steps, also allow for a more consistent definition and prioritization of technical objectives.

As part of the Secretariat's ongoing dialogue with States on this matter, in July last year, the DG issued his report on 'Implementation of State-level safeguards approaches for States under integrated safeguards—experience gained and lessons learned'.

Moving forward, our immediate efforts are concentrating on ensuring that our SLA processes are indeed consistent and applied uniformly across all operations divisions. The Department is developing additional guidance and tools to support the work, and reviewing and updating the SLAs that have been developed so far. We are using a robust internal review process for this, ensuring safeguards approaches are objective and non-discriminatory. The current focus is on updating and refining the SLAs for States under integrated safeguards, so that our experience with these States can be improved over time.

The number of States with a comprehensive safeguards agreement for which an SLA has been developed has now reached 130. These 130 States hold 97% of all nuclear material (by significant quantity) under Agency safeguards in States with a comprehensive safeguards agreement. So you can see that we have made significant progress on this front and we will continue to develop and implement SLAs for all States, in accordance with the processes set out in the Supplementary Document presented to the IAEA Board of Governors in 2014.

The Safeguards Department's main product to the Board of Governors is our conclusions, which are contained in the annual Safeguards Implementation Report. These conclusions are the product of an internal process called State evaluation. State evaluation is the ongoing evaluation of all relevant information available to the Agency about a State and is aimed at assessing the consistency of that information in the context of a State's safeguards obligations. To be effective, we need the State evaluation process to be rigorous, with thorough analysis underpinning soundly-based and well documented results. One of the ways in which I have strengthened State evaluation is through the use of Peer Review Teams. These are proving extremely useful in making sure that State Evaluation Groups consistently use the best approaches and tools in preparing SERs and in drawing up Annual Implementations Plans.

All of this work in relation to SLAs has now been pulled together under a major Departmental project to ensure that SLAs all meet a high standard of quality and are implemented to the same standard.

The modernization of safeguards IT under the MOSAIC project has ensured that the Department's IT system supports all safeguards implementation processes well into the future. Through MOSAIC, new and improved IT applications are allowing for better planning, conducting, reporting, and quality assessment of safeguards activities. The Department has undertaken this upgrade using in-house expertise, but has relied heavily on extra-budgetary support from Member States. The entire upgrade was completed in May 2018—on schedule and within budget.

Another crucial benefit of the MOSAIC project was the increased ability to defend against cyber security threats that it delivered. Indeed, in recent times, the Department of Safeguards has taken a number of important steps to improve the cyber security

of information in its possession. These steps include moving safeguards confidential system and files into a secure environment, raising staff awareness about cyber threats, and ensuring that we comply with international best practices in this area.

Environmental sampling and nuclear material analysis are crucial to effective verification. As capabilities in this area advance, the IAEA's analytical laboratories in Seibersdorf and the 22 other laboratories that comprise the Agency's Network of Analytical Laboratories will remain tightly coordinated. The Agency is examining ways of improving the timeliness of its analysis. The IAEA will also improve its quality control programme for the Network of Labs, in particular in the area of particle analysis.

The Agency is constantly working to ensure that it deploys equipment for measurement and containment techniques that inspectors find easy to use. Such equipment needs to be sufficiently rugged to be shipped around the world and flexible enough to be used in a number of different environments.

The Agency has expanded and enhanced its use of unattended monitoring systems and improved its corresponding capability to receive remote data transmission at Headquarters in Vienna. The use of remote data transmission enables greater verification efficiency by relieving inspectors of the task of collecting and reviewing data at facilities. It also allows early detection of any deterioration in system performance.

The Agency also now constantly monitors commercial technologies to identify and potentially exploit innovations that could enhance its capabilities. In November 2018, at the IAEA's quadrennial Safeguards Symposium, for example, the Agency looked at the possibilities offered by robotics and how different gamma imaging cameras might be utilised. The Agency is keen to find promising technologies for further testing and, if such tests are positive, move expeditiously to deploy them in the field.

At the diplomatic level, Member States increasingly want to better understand how safeguards are implemented and to receive new levels of communication and transparency from the Secretariat. We will maintain that active dialogue with our Member States through bilateral discussions, technical meetings and formal reports to the Board of Governors.

Iran—Turning now to the Joint Comprehensive Plan of Action—JCPOA or “Iran nuclear deal”—which has posed particular challenges for the IAEA: in terms both of overall effort and in particular technical aspects.

Clearly, it is a gain for verification. The combination of a Comprehensive Safeguards Agreement, Additional Protocol and further transparency measures itemised in the deal represents the most robust overall verification system applied in the world today. And Iran's nuclear-related commitments under the deal have resulted in a significant reduction in Iran's declared nuclear activities and major constraints on those activities that Iran is allowed to maintain.

While the IAEA played a key role before, during and after the negotiation of the JCPOA, it is not a party to the Agreement. Nor is it for the IAEA to determine whether Iran is in compliance. We simply report the facts to our Board of Governors and to the UN Security Council.

In order to verify and monitor Iran's implementation of its nuclear-related commitments under the JCPOA our inspectors are on the ground 24/7. They now spend around 3000 days in the field in Iran each year, twice as many as before the deal took effect. They have taken hundreds of environmental samples and placed around 2000 tamper-proof seals on nuclear material and equipment. The Agency has collected and analysed hundreds of thousands of images captured by our sophisticated surveillance cameras along with several million pieces of open-source information. Furthermore, all of our activities are supported by state-of-the-art technology, including systems that collect and process data. Added to which we have access to more locations under the Additional Protocol, which enables us to learn more about Iran's nuclear programme overall.

Many of the things the Agency was requested to do under the JCPOA (and the Joint Plan of Action before it)—required it to develop new, robust approaches and ways of working—even to develop new equipment—and to do so inside a very short timeframe. In such cases there were no “baseline” documents to consult, and no precedent to help us.

As all of us are keenly aware, the future of the Iran deal is uncertain. Iran has reduced a number of its commitments. Nevertheless, the Agency's verification and monitoring system in Iran remains intact and we will continue to report the reality on the ground for as long as we are required to do so.

DPRK—It is over a decade since IAEA inspectors were required to leave North Korea. Since then, the Agency has not been able to carry out any verification activities in the country. However, the Agency continues to monitor the DPRK's nuclear programme and evaluate all safeguards-relevant information available to it, including open source information and satellite imagery.

In the past 10 years, the DPRK's nuclear programme has significantly expanded. It has started uranium enrichment, built a light water reactor and restarted all the nuclear facilities in Yongbyon, including the 5 MW(e) reactor and reprocessing plant. However, without access, the Agency cannot confirm the nature and purpose of the activities I just described. Since 2009, the DPRK has announced that it has conducted five nuclear tests, in addition to the one announced in 2006.

In 2017, the Agency created an Executive Group and Agency Team dedicated specifically to the DPRK. This team has increased the monitoring of the DPRK's nuclear programme through more frequent collection of satellite imagery. It has also enhanced the Agency's readiness to promptly undertake any verification it may be requested to conduct in the DPRK if a political agreement is reached among countries concerned. Subject to the approval of our Board of Governors, we could respond within weeks to any request to send inspectors back to the DPRK.

Conclusion—By successfully addressing the challenges that I have identified today, we can ensure that the IAEA continues as a modern, highly productive and lean verification organization. Inside the Safeguards Department we will continue to improve our processes to ensure delivery of desired outcomes; maximising collaboration through teamwork within the Department; and ensuring an efficient distribution of resources. Such enhancements are vital if the Agency is to bridge the gap

between demand and resources, and demonstrate to Member States that it is using their resources wisely and effectively.

The challenges to the safeguards system are more profound and varied today than they have ever been. To succeed, the IAEA will need to be able to respond to the unexpected, while strengthening the credibility of the safeguards conclusions it draws. I am confident that working together with Member States and the wider safeguards community, we can meet those challenges and make the world a safer place for future generations.

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