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## **A Changing Nuclear Landscape: Preparing for Future Verification Challenges**

Key Note Address

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The International Atomic Energy Agency (IAEA) has been working for more than five decades to help humankind enjoy the benefits of nuclear energy, while at the same time minimizing the associated risks by applying safeguards to States' civilian nuclear programmes. Throughout its existence the Agency has had to adapt to a changing world and respond to the growing needs of its Member States.

The conclusion of the Treaty on the Non-Proliferation of Nuclear Weapons – the NPT – in 1968 established the IAEA as the world's global nuclear verification Agency: a major international responsibility that was added to by a number of subsequent regional nuclear-weapon-free zone treaties.

As you are all aware, the weaknesses of the safeguards system being routinely applied by the IAEA was glaringly exposed in the early 1990s with the discovery of Iraq's clandestine nuclear weapons programme. This led to important strengthening measures, including the adoption of the Model Additional Protocol, which equips the Agency with important supplementary tools that provide broader access to information and locations.

More recently, a number of other safeguards challenges have led to increasing expectations of the safeguards system. These include undeclared nuclear material activities by Iran and Libya's admission that it had engaged in nuclear weapons related research and attempted to acquire related technology. The latter case highlighted the emergence of a new non-State threat – that is, covert nuclear technology supply networks – the most notable example of which was that operated by A.Q. Khan.

These developments serve to illustrate the ever-evolving nature of the IAEA's operating environment, and help to underscore the importance of the Agency better preparing itself for the future and of improving both the effectiveness and the efficiency of the safeguards system. That is why, over the past two years, the Department of Safeguards has engaged in a major strategic planning process, the outcome of which is reflected in the Department's Long-Term Strategic Plan, covering the period 2012-2023.

In this process, we identified a number of important challenges for our future work.

First, in order to help restore international confidence in the nuclear non-proliferation regime, the Agency needs to resolve the current outstanding safeguards implementation issues in Iran and Syria. Also, pending resolution of the situation in the Korean peninsula, we must prepare to resume the Agency's activities in the DPRK. More generally, given the prospects for the wider use of sensitive fuel cycle technologies, the international community will increasingly rely on the Agency to effectively deter proliferation through *early* detection and warning of potential misuse of peaceful nuclear programmes.

In this respect, globalisation is expected to continue to increase nuclear proliferation risks. For instance, the erosion of national borders and an expansion of global trade are facilitating the covert operation of nuclear technology supply networks. In addition, increasing interconnectedness, through the internet and other electronic media, is making access to proliferation-sensitive information easier.

Looking further into the future, we see interest in nuclear power increasing around the world. The IAEA expects global nuclear electrical generating capacity to grow from anywhere between some 40 and 120 per cent by 2030. And we expect between 10 and 25 new countries to bring their first nuclear power plants on line within the same period. Inevitably, this will bring many additional nuclear facilities and activities, as well as more nuclear material, under IAEA safeguards. Notably, our safeguards activities are already increasing rapidly in India. The wider use of nuclear energy also means that there will be growing international nuclear cooperation between States – with an expansion of trade in nuclear and related equipment, items and materials. Therefore, our safeguards workload, both in the field and at Headquarters, is likely to grow significantly in the coming years.

The IAEA will also face qualitative challenges. As the nuclear industry continues to evolve technologically, so the Agency will need to be ready to safeguard new types of nuclear reactors and more advanced or larger scale nuclear fuel cycle facilities. At the same time, technological progress offers us important opportunities to improve verification methods and to work more efficiently and effectively.

Besides carrying out its traditional safeguards activities, given the new momentum behind disarmament, the Agency may well be requested to take on additional nuclear verification roles in the future. Indeed, we have already been requested to assist in the independent verification of the implementation of the US-Russian agreement on the disposition of plutonium no longer required for defence purposes (Plutonium Disposition Management Agreement).

There will also be organizational challenges. For example, while demands on the Agency look set to grow, its financial resources may not increase commensurately. Moreover, on the recruitment front, we will need to be able to compete with industry and national nuclear administrations over a small and potentially shrinking pool of qualified nuclear professionals.

While our operating environment is constantly changing, our overarching departmental strategic objectives must stand the test of time. The first one goes to the core of the Agency's nuclear safeguards mission, namely, to *deter the proliferation of nuclear weapons, by detecting early the misuse of nuclear material or technology, and by providing credible assurances that States are honouring their safeguards obligations*. This objective conveys the higher purpose of helping to deter the proliferation of nuclear weapons – that is to say – we do not do safeguards for the sake of safeguards. We deter proliferation in two ways: first, by providing credible assurances that States are honouring their safeguards commitments – thereby building confidence in compliance: this is an important confidence building measure, particularly in the regional context. Second, by detecting early the misuse of nuclear material or technology, we provide early warning to the international community, so that it can put in motion other mechanisms to address the problem.

Our next objective is an organisational one – that is – to *continually improve and optimize departmental operations and capabilities to effectively carry out the IAEA's verification mission*. Responding to Member States' expectations for effectiveness and efficiency, this objective demonstrates our commitment to continual improvement and the pursuit of excellence as an organization.

As a final objective the Agency will actively *contribute to nuclear arms control and disarmament, by responding to requests for verification and other technical assistance associated with related agreements and arrangements*. Although the Agency's role in this area has been more limited, it could take on greater significance in the future, given the new momentum behind nuclear disarmament, as alluded to previously.

Let me now elaborate on the strategies we intend to pursue in the years ahead, in support of our strategic objectives. They address various elements that define or have an impact on the Agency's work, including the conceptual framework; legal authority; technical capabilities (expertise, equipment and infrastructure); human and financial resources; as well as the Agency's stakeholders – all of which are necessary for effective and efficient verification.

In terms of the conceptual framework for safeguards, our aim is to draw soundly-based safeguards conclusions, so States can have high confidence in the IAEA's assurances, and to increase the probability of detecting early the misuse of nuclear material and technology. To this end, we will further develop the State-level concept for the planning, implementation and evaluation of safeguards activities. This concept is applicable to all States with a safeguards agreement in force and is based on a comprehensive evaluation of all safeguards-relevant information on, and a tailor-made safeguards approach for, an individual State.

In essence, the Agency is moving away from safeguards implementation that is prescriptive, driven by pre-determined criteria and focused at the facility level – to one that is customized, driven by outcomes and focused at the State level. By taking into account a broader range of State-specific factors, safeguards activities in the field and at Headquarters will become increasingly information driven, focused and efficient.

The Agency's implementation of safeguards for any given State, therefore, needs to be flexible, and driven by all the safeguards-relevant information available to us about that particular State: information that we derive from obligatory State declarations and other reports, from the Agency's own verification activities, and from all relevant sources. It is upon an evaluation of all this information that we plan and implement our verification activities and ultimately draw our safeguards conclusions for each State.

Let me be clear - we are not proposing to develop a different safeguards system, but consider these improvements as the next logical step in safeguards implementation. We will not discriminate against certain States or categories of States but will continue to apply safeguards in a fair and non-discriminatory manner. All States will remain subject to the same rules and overall objectives as before.

This new approach has implications for how the Agency operates internally. We will need to revise some of our business processes, better define responsibilities, and make changes to the organization itself. We will also need to enhance the skill sets of our workforce and to foster the required organizational culture. Some initiatives in this regard are already underway.

There are other areas in our Plan, however, where we are reliant on States. The Agency's legal authority provides the basis for all we do, so we are more likely to be successful if our

legal authority is universal, fully utilized and responsive to evolving proliferation challenges. To this end, the Agency will continue to promote the conclusion of comprehensive safeguards agreements and additional protocols and the rescission or modification of small quantity protocols. The wider application of additional protocols is of particular importance, especially in States with significant nuclear activities. And when the legal authority is in place, we need to make sure that we are making full use of it. It will also be important that we provide guidance and training to States – particularly those States introducing nuclear power – on the implementation of the safeguards obligations they take on. Looking further into the future, we must keep the legal authority under continual review, to ensure that it stays responsive to emerging proliferation challenges.

Nuclear non-proliferation is a collective global effort, which is more likely to succeed when all members of the international community work together. Likewise, the IAEA is more likely to be successful when it works in partnership with States. Hence, we will reach out to States to increase the sharing of safeguards-relevant information on a voluntary basis, to strengthen the IAEA's capabilities to detect undeclared activities in particular.

We also rely on States' support in other areas, particularly in the day-to-day implementation of safeguards. The growing safeguards workload and static Agency regular budget require greater efficiency in safeguards implementation. Therefore, we will work to ensure that States have competent State safeguards authorities and support States in making their State systems of accounting for and control of nuclear material (SSACs) more effective. Where possible, we will gain efficiencies by making greater use of effective SSACs and their regional equivalents.

Technology is a major enabler for the Agency's verification work. In order to stay abreast of scientific and technological developments, and to make use of promising innovations with significant safeguards application or other benefit, we plan to strengthen our technology foresight. For one, advance planning coupled with smart technology can enable efficiencies in safeguards implementation. The Agency will develop dedicated safeguards approaches, techniques and equipment for new types of facilities well in advance, so that safeguards can be built into their original design. In light of the projected nuclear expansion, it is especially important that facility providers and operators design and operate 'safeguards friendly' nuclear installations.

In this respect, the Agency has gained significant 'safeguards-by-design' experience during its long involvement with the design, development and application of safeguards at the Rokkasho Reprocessing Plant here in Japan. The lessons learned are now being applied to the design and construction of the Japan mixed-oxide fuel fabrication plant at Rokkasho. Both cases are good examples of fruitful cooperation between the IAEA and Member States.

The Agency will continue to rely on its presence in the field, utilizing technology to generate efficiencies. Increased use of remote technologies, secure communication technologies, and user-friendly, multifunctional field equipment will help to make optimum use of our inspectors' presence in the field.

Technology can also keep us a step ahead of those who want to defeat the safeguards system. The Agency will increasingly invest in capabilities to detect undeclared activities. We will utilize effective new/novel technologies for the detection of undeclared nuclear material and activities. We will maintain vital safeguards infrastructure, improving the capabilities of the Safeguards Analytical Laboratories in Seibersdorf, Austria so that the Agency has timely,

reliable analytical results from nuclear material and environmental samples. We also want to develop an independent capability to carry out nuclear forensics.

Other infrastructure priorities concern the processing, analysis and evaluation of safeguards-relevant information – this is ever more important as we move to a safeguards system which is fully information driven. To store and effectively use safeguards knowledge, we are putting in place a modern and secure safeguards information architecture that will form the foundation for a state of the art system of integrated analysis to be implemented in the next few years.

Member States are important partners in strengthening the Agency's technical capabilities. The Agency will employ a mission driven R&D plan and seek effective partnerships with Member State Support Programmes to ensure their support is focused and meets our priority needs.

However, technology is no substitute for human insight. Staff and knowledge are the Agency's most strategic organizational assets. Our strategies aim to recruit, develop, and retain a safeguards workforce capable of meeting both current and future needs. To be able to compete with others, we must increase the competitiveness of the Agency as an employer, better market our strengths to prospective employees and improve our recruitment processes. Training will play a key role in ensuring our workforce is equipped with the requisite expertise and skills. Importantly, we will also seek to effectively manage our intellectual capital, ensuring that knowledge is captured, shared, used and preserved so that our corporate memory is secured.

And finally, another important element is communication – the safeguards system needs to be transparent and understandable –internally to those who are implementing it, as well as externally to Member States and the general public. Therefore, we will seek to improve the openness and quality of the IAEA's reporting and other communications on safeguards and verification matters and build States' knowledge of the processes for drawing safeguards conclusions, to enhance their understanding of, and confidence in, the IAEA's assurances. We will also inform States and other stakeholders of the challenges to the safeguards system. These are all important strategies for building support for the IAEA's verification mission.

In conclusion: maintaining an effective and efficient safeguards system is a continuous journey. A resilient safeguards system that provides credible assurances to the international community is the ultimate stamp of confidence that enables the promotion of the peaceful use of nuclear energy. As you have heard, we have much work ahead of us. But, with your support, I am confident that the IAEA can continue to play a vital role within the nuclear non-proliferation regime in the years to come.

Thank you for your attention.