NUCLEAR NON-PROLIFERATION: RESPONDING TO A CHANGING LANDSCAPE

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INTERNATIONAL ATOMIC ENERGY AGENCY

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I am privileged to be here today on behalf of Dr. ElBaradei and the International Atomic Energy Agency. Dr. ElBaradei sends his regrets that he was unable to attend, due to another earlier commitment. He sends his best wishes for a successful conference.

It is no secret that the nuclear non-proliferation regime today faces a broad array of challenges. Some refer to the system as being 'in crisis'; that may be too strong a statement, but the regime is certainly being tested. A number of vulnerabilities in the system have been exposed in recent years, and changes are clearly needed if we are to avoid the further proliferation of nuclear weapons.

Why are these changes needed?

The answer is quite simple. The world is undergoing rapid changes on many fronts — socially, politically and technologically. The Treaty on the Non-Proliferation of Nuclear Weapons (NPT) was ratified more than 30 years ago. It should not surprise us that the solutions of 1970 are not a perfect fit to the challenges of 2006 and beyond. The problem is that we have not in all cases made the necessary adjustments to match these new challenges.

In particular, since the end of the Cold War, we have seen three developments related to nuclear proliferation: (1) the increased dissemination of nuclear technology and nuclear 'know-how'; (2) a renewed drive on the part of a few States and extremist groups to acquire nuclear weapons; and (3) the emergence of clandestine nuclear procurement networks.

In addition to these trends, the renewed interest in nuclear power on the part of many countries — and the expectation for an expansion in new nuclear construction — makes it even more important that we have strong mechanisms in place to minimize the risks of proliferation. The international community will demand no less.

Today I would like to discuss a number of suggestions on how the regime might be strengthened to meet these new challenges.

1. Better Control of Access to Nuclear Fuel Cycle Technology

The first question is how to better control access to, and ensure the appropriate use of, sensitive nuclear technology.

This has become more far difficult in recent years, in part because of changes that relate to globalization. Far more countries have sophisticated engineering and industrial capacity, which is necessary for development, and should be welcomed. However, at the same time, nuclear technology has diversified, making it harder to track illegal or clandestine procurement and sales. Electronic communication has made it easier to transmit component designs and other information. And many types of sensitive equipment are classified as 'dual use' — meaning that it could have both nuclear and non-nuclear applications — which makes it harder to maintain export restrictions.

As we all agree, under the NPT regime, there is nothing illegal about any State having enrichment or reprocessing technology. A relatively small number of countries have mastered part or all of the nuclear fuel cycle, enabling them to enrich uranium, produce fuel for power and research reactors, and reprocess spent fuel for re-use and waste disposal.

But as more countries gain this expertise, concerns have arisen regarding the margin of security resulting from this situation. The acquisition of high enriched uranium or separated plutonium is generally considered to be one of the most difficult steps towards making a nuclear weapon. By having access to nuclear material, or the capability to produce such material, a country has passed this step. Therefore, if a country with a full nuclear fuel cycle to produce enriched uranium or plutonium were to decide to break away from its non-proliferation commitments, a nuclear weapon capability could be within reach in a relatively short time.

For this reason, the IAEA and others have been exploring options for how the most sensitive aspects of the nuclear fuel cycle — uranium enrichment and plutonium separation — might be better implemented. The overall concept would be to move towards multinational arrangements for these types of operations. This would not happen all at once; as currently envisioned, it would progress as a series of measures:

1. First, a mechanism would be developed to provide an 'assurance of supply'; that is, a guarantee that reactor technology and nuclear fuel would be available for all bona fide users for peaceful civilian applications;

2. The second step would be to call for a temporary moratorium (for example, for 5 or 10 years) on new uranium enrichment and plutonium reprocessing facilities — at the very least for countries that do not currently have such technologies;

3. Third, we would work on establishing a framework for multinational management and control of the 'back end' of the fuel cycle (i.e. spent fuel reprocessing and waste disposal); and

4. Fourth, a similar framework would be created for managing and controlling the 'front end' of the fuel cycle (i.e. enrichment and fuel production).

The first step — assurance of supply — has already gained considerable attention. The importance of this measure is that, by providing reliable access to reactors and fuel at competitive market prices, the justification is removed for new countries to develop their own fuel cycle capabilities. But this means that the mechanism to assure supply must be reliable and credible.

A number of governments, industry groups and other organizations have been offering ideas and initiatives on how to facilitate progress with the assurance of supply. This coming September, at the IAEA General Conference in Vienna, we will hold a 'Special Event' focused on developing a roadmap for moving forward in this area.

2. Ensuring the Protection of Nuclear Material

Another area of vital importance concerns the protection of nuclear material. Many international and regional initiatives are underway to help countries in this effort. Some of the most ambitious projects have been undertaken in Russia and the Newly Independent States. According to recent reports, these projects have made a great deal of progress in the past four years, but much also remains to be completed.

The importance of protecting such material has been elevated by the stated ambition of extremist groups to pursue nuclear and radiological terrorism. The frequency with which the IAEA's Illicit Trafficking Database receives reports involving nuclear or radiological material makes clear that vulnerabilities remain. Fortunately, only a relatively

small number of these cases so far have involved high enriched uranium or plutonium. But this should not be a source of comfort. If an extremist group were to acquire nuclear or radiological material, we must assume they would not hesitate to use it.

Several agreements have been reached on how to enhance nuclear security. The UN Security Council adopted resolution 1540 in 2004. The *International Convention on the Suppression of Acts of Nuclear Terrorism* was adopted by the UN General Assembly last year. Both resolution 1540 and the *Convention* call on countries to criminalize the illicit possession and use of radioactive material, and aim to enhance efforts to detect and combat illicit trafficking. And the parties to the *Convention on the Physical Protection of Nuclear Material* — for which the IAEA serves as facilitator and repository Agency — also agreed last year on major changes to better protect nuclear facilities and material. The IAEA has been supporting a number of initiatives — such as the regional seminar held in Quito, Ecuador last month — to encourage countries to implement these measures as fully and as early as possible.

Many countries have also been taking steps to convert their research reactors from high enriched to low enriched uranium fuel, and to return the high enriched uranium to the country of origin. But of the research reactors currently in operation, nearly 100 still use HEU enriched to 90% or higher — the level of enrichment needed for use in nuclear weapons. Next month in Oslo, a conference will be held to discuss strategies for minimizing the use of HEU in the civilian nuclear sector.

So while it is clear that these and other steps are helping to reduce the risks posed by existing nuclear material, it is also clear that much work remains to be done.

3. Supporting Effective Nuclear Verification

A third area of importance is to provide the necessary level of support that will optimize the effectiveness of nuclear verification.

One key to the effectiveness of verification is the extent of access that Agency inspectors are given to information and locations. This access is governed by the legal agreements concluded between individual countries and the IAEA. In today's security environment, inspections that only verify what a country has declared under a comprehensive safeguards agreement are not likely to be considered effective enough, in terms of the degree of assurance they provide.

On the other hand, the expanded access provided by the 'additional protocol' to safeguards agreements has, in recent years, clearly proven its worth. The additional protocol enables Agency verification efforts to focus not only on what has been declared, but also on possible undeclared activities. The Model Additional Protocol was agreed upon in 1997, as a development that grew out of the case of Iraq's nuclear weapons programme in the early 1990s.

As a side note, I should point out here, while discussing the scope of IAEA verification, that both safeguards agreements and additional protocols are focused principally on nuclear material. Therefore, the Agency's legal authority to investigate possible parallel weaponization activity is limited, unless there is some nexus linking the activity to nuclear material.

The chief problem with the additional protocol is that it has not been universally applied. Today only about 70 countries have additional protocols in force. This limited number, nine years after the adoption of the Model Additional Protocol, falls well short of the Agency's goal. The Agency's verification efforts will not be regarded as 'fully effective' as long as its inspection rights remain uneven from country to country. For the nuclear non-proliferation regime to be regarded as credible, it seems clear that the additional protocol must become the universal standard for how nuclear non-proliferation commitments are verified.

To that end, the IAEA welcomes all the efforts made by the Government of Japan to promote wider adherence around the world to the additional protocol.

It is also important to consider that the central reason for verification is to build confidence. In recent years, we have seen that there are cases where proliferation concerns have created a confidence deficit, where even the access rights of the additional protocol may not be sufficient. In such cases, additional 'transparency measures' may be called for.

Our verification work in Iran is a case in point. Over the past three years, Agency inspectors have made extensive efforts to compile a detailed picture of most aspects of Iran's past and current nuclear programme. But since parts of the programme were concealed for nearly 20 years, this naturally has been a complex and labor-intensive effort, and a number of open questions regrettably remain unresolved. Therefore, the Agency's Board of Governors has asked Iran to provide additional transparency measures — beyond even what would normally be expected under the additional protocol — to help to resolve

these remaining questions, and thereby to provide the needed assurance about the peaceful nature of Iran's nuclear programme.

The points I have outlined so far might sound somewhat negative. But at the same time I would note that, in the past few years, the Agency has been able to make progress on the implementation of integrated safeguards. This includes reaching the conclusion —for States that have both a comprehensive safeguards agreement and an additional protocol in force — that there are no undeclared nuclear materials and nuclear activities in these States. In 2005, this conclusion has been reached for 24 States. And so far, integrated safeguards is being fully implemented in nine States, including Japan. This is a positive development, and should be welcomed. It is particularly significant in the case of Japan, which has the largest and most complete nuclear fuel cycle of any of the States in question. By reaching this conclusion in a given State, the Agency is able to use its resources more efficiently.

Another key to making verification effective is sufficient resources. IAEA verification today operates on an annual budget of about $120 million — a budget that would be comparable to that of a professional baseball team or the police force of a large city, or half the price of a single fighter jet. With these resources, we oversee approximately 900 nuclear facilities in 71 countries. On the one hand, I am very proud of the professionalism and efficiency measures that have made this achievement possible. On the other hand, when I look at our growing responsibilities — as well as the need to 'stay ahead of the game' — we are clearly operating on a 'bare minimum' level of funding.

4. People and Technology: Planning for Increased Effectiveness

This brings me to the next topic — and perhaps the most important: as we look to the future, what can be done to assure ourselves and our Member States that the IAEA, as the international nuclear verification organization, will be 'staying ahead of the game'? With the global reach of our responsibilities, and the continuous need to sift through vast amounts of information, how can we be sure that we are looking in all the right places? And how do we prioritize, using our limited resources to the best advantage?

Successful nuclear verification involves an interface between technologies, the professionals who use those technologies, and the institutions they represent. So far I have spoken mostly about ensuring the effectiveness of institutions and institutional measures. I would like to use my remaining time to discuss workforce challenges and a number of aspects of verification-related technology.

During the last few years, we have been working on succession planning for the IAEA safeguards workforce. The average age of the Agency safeguards inspectorate has been rising for more than a decade. The overall safeguards workforce has increased in number, but the largest percentage of that increase has been individuals between 55 and 62.

At the same time, we are finding recruitment more difficult. The pool of well-qualified candidates is getting smaller, and the Agency must compete with national governments and industry to hire fresh professionals with the proper expertise. Our salaries and compensation are not always competitive, and our inspector positions often come with long hours and adverse travel schedules. On the other hand, the work is clearly rewarding, challenging and of the greatest importance.

These workforce challenges come at a time when the level of external scrutiny on the quality of our verification efforts has of course increased. In addition, the fact that we seek to draw broader conclusions under the additional protocol — regarding the absence of undeclared nuclear activity in a country — means that the inspectorate may need to be familiar with a broader array of safeguards-related systems, components and monitoring equipment. The amount of information available through open sources — collected through the Internet and other media — has increased significantly. The evaluation of a country's overall nuclear programme, therefore, has become a more thorough and complex exercise.

All these aspects combine to form a greater challenge for the IAEA's safeguards and verification professionals. We must continue to enhance the specialized IAEA safeguards inspector training to ensure the proper skills. And we must ensure sound recruitment strategies in all geographic regions, to take full advantage of those academic institutions and organizations that are producing candidates with the needed technical background.

On the technology front, staying ahead of the game is equally challenging, if not more. In many fields of modern technology, the focus on innovation means that each new gadget or invention rapidly becomes obsolete. For the IAEA, this means the frequent consideration of new technologies that can be put to use — within our budgetary constraints — to optimize our verification efforts.

Advanced technology has played a critical role in recent years in exposing clandestine nuclear programs. The use of satellite imagery, for example, has been important in detecting changes in nuclear and other facilities. Advanced 3-D visualization tools have improved our ability to interpret those changes. Modern nuclear forensic techniques — applied both in the Agency's own laboratories in Seibersdorf, Austria, and by other analysts in the IAEA network of analytical laboratories (NWAL) — has significantly increased the sophistication with which swipe samples and other environmental samples are analyzed. These analyses have been a key aspect of our capability for tracing and uncovering previously unreported nuclear activity — such as, for example, in determining the nature and origin of contamination found on equipment.

As we look to the future, the IAEA verification programme will continue to be in the market for innovative technologies that can be used to detect undeclared nuclear material, facilities and activities. I understand that, in the session tomorrow, this topic will be discussed in more detail.

Innovative technologies could also prove useful in other ways. Technology could enable more sophisticated tracking of nuclear material. It could improve our ability to conduct data analysis in the field. Advanced communication technology could enhance our capability for real-time consultation with experts in other locations, as well as our capacity for remote surveillance and monitoring of sensitive nuclear facilities and operations.

Finally, as we look toward the potential expansion in new nuclear power plant construction, it is important that new reactor and fuel cycle technology employ innovative safeguards approaches. In other words, advanced nuclear energy designs should be developed with features that enhance proliferation resistance, by designing from the outset with effective safeguards in mind. An example might be the design of modular reactor cores that would need to be refueled far less frequently.

Conclusion

By entrusting to an impartial, independent IAEA inspectorate the task of verifying the peaceful use of nuclear energy, the international community has taken an important step towards improving the transparency of nuclear activities, and thereby indicated its strong support for international peace and security. This is a responsibility that we at the

Agency take very seriously. Every measure should be taken to ensure the effectiveness of our efforts. By adhering to their safeguards commitments, by taking prompt and responsible actions to correct problems, and by providing the IAEA with the resources necessary to do the job, States demonstrate the political will to ensure the effectiveness of the global nuclear non-proliferation regime.

Thank you.