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Statements of the Director General

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The lecture was [webcast](#) including a Q&A session.

Reflections On Nuclear Challenges Today by IAEA Director General Dr. Mohamed ElBaradei

I am honoured to deliver the Alistair Buchan memorial lecture today. Professor Buchan's contributions to the debate on nuclear non-proliferation and disarmament, and his efforts — as a journalist, educator, government leader and (not least) the first director of the International Institute of Strategic Studies — to engage the public and civil society in this debate, greatly contributed to our understanding of these issues, and highlighted the need for a continuing public dialogue on questions that touch on our very survival.

In today's world, there is a prevailing sense of insecurity.

In late 2003, Gallup International conducted a poll of 43 000 individuals in 51 countries, to ask how they felt about the state of international security. Almost twice as many respondents rated global security as "poor" as those who answered "good". And almost half said they believed their children — the next generation — would live in an even more insecure world.

Why do we feel so insecure? What kind of security threats do we face?

Clearly, our security threats cover a broad spectrum, and vary in nature and magnitude. They range from poverty, infectious disease and environmental degradation to organized crime, terrorism, armed conflict and weapons of mass destruction.

These issues may appear unrelated. But when we take a closer look, we find them clearly connected. The huge and widening gap in living conditions, with 40 percent of the world's population surviving on less than \$2 per day, inevitably results in diminished opportunities and a sense of despair. These conditions — compounded in many cases by human rights abuses, the absence of good governance, and a sense of injustice and humiliation — provide the ideal environment for civil wars, organized crime, and all forms of extremism. And often, in regions plagued by longstanding conflict, countries hoping to achieve security and project power end up following in the footsteps of those who have resorted to nuclear weapons in search of security.

Non-Proliferation And Disarmament: A Changing Landscape

With this "setting" as a backdrop, we can understand more clearly the changes in the nuclear non-proliferation and disarmament scene.

There are three main features to this changing scene: the proliferation of nuclear weapons and sensitive nuclear technology; the emergence of clandestine procurement networks in nuclear materials and equipment; and the sluggishness in nuclear disarmament. In response to this changing landscape, I would like to suggest a few practical steps that can help us address these emerging challenges.

Step One: Better Control of Access to Nuclear Fuel Cycle Technology

The control of access to sensitive nuclear technology has grown increasingly problematic in recent years.

And the nuclear marketplace has grown more complex. Far more countries have sophisticated engineering and industrial capacity. Nuclear technology has diversified, making it harder to track procurement and sales. Electronic communication has made it easier to transmit component designs and other information. Much of the sensitive equipment is "dual use" — which makes it harder to justify export restrictions.

The present situation, as a result, is markedly different from that of the 1970s, when the *Treaty on the Non-Proliferation of Nuclear Weapons (NPT)* came into being. Under the current regime, there is nothing illegal about any State having enrichment or reprocessing technology, or even possessing stocks of weapon-grade nuclear material.

More countries have sought to master the nuclear fuel cycle, both for economic reasons and, in some cases, as a good insurance policy for a rainy day. Whatever the reason, this know-how essentially transforms them into what might be called a "virtual" or "latent" nuclear-weapon State. Experience has shown that a "choke point" for nuclear weapons development is the acquisition of weapon-useable nuclear material. If a country with a full nuclear fuel cycle decides to break away from its non-proliferation commitments, a nuclear weapon could be only months away.

In such cases, we are only as secure as the outbreak of the next major crisis. In today's environment, this margin of security is simply untenable.

The good news is that there may be a solution on the horizon.

Last year I asked a group of experts to explore options for better control over these aspects of the fuel cycle. Their work and the ideas of others have helped to shape my thinking on how such controls might be put in place.

As I see it, this could occur through a series of measures:

1. Provide assurance of supply of reactor technology and nuclear fuel;
2. Accept a time-limited moratorium (of perhaps 5–10 years) on new uranium enrichment and plutonium separation facilities — at the very least for countries that do not currently have such technologies;
3. Establish a framework for multilateral management and control of the "back end" of the fuel cycle (i.e. spent fuel reprocessing and waste disposal); and
4. Create a similar framework for multilateral management and control of the "front end" of the fuel cycle (i.e. enrichment and fuel production).

Much attention is already being given to the first measure — the assurance of supply. The importance of this measure is that, by providing reliable access to reactors and fuel at competitive market prices, we remove the incentive or justification for countries to develop indigenous fuel cycle capabilities. In so doing, we could go a long way towards addressing current concerns about the dissemination of such capabilities.

The key feature of such an arrangement is not simply availability, but reliability. For this assurance of supply mechanism to be credible, it must be based on apolitical, objective non-proliferation criteria. Under the IAEA Statute, the Agency could act as the facilitator and guarantor of this assurance of supply mechanism, to be used as a supplier of last resort.

I am encouraged by the range of supportive reactions to this initiative. In Moscow in July, a conference discussed, among other multilateral approaches, the feasibility of fuel leasing. The uranium industry and the World Nuclear Association have set up a working group to explore strategies for fuel assurances. The US announced last month that it would make available enough fuel for ten reactor cores, to be used under an assurance of supply scheme. Russia has also recently indicated that it intends to make fuel available to the IAEA, to be used as part of an Agency fuel bank. And the Nuclear Threat Initiative is ready to contribute generously towards the same goal.

Given the rising expectation for the expanded use of nuclear energy in many countries, these multilateral approaches could offer clear advantages in terms of safety, security, economics *and* non-proliferation.

Step Two: Supporting Effective Nuclear Verification

A second step is to provide nuclear verification with the support it needs to be effective.

The biggest key to effectiveness is the *extent* of access inspectors are given to information and locations. This access is governed by legal agreements. In today's security environment, inspections that only verify what a country has *declared* are not likely to be considered "effective", in terms of the assurance they provide.

On the other hand, the *expanded access* provided by the "additional protocol" to safeguards agreements, which most importantly enables the Agency to verify possible undeclared activities, has proven its worth. This protocol was agreed upon in 1997, based on the Agency's painful wake-up call in the case of Iraq's nuclear weapons programme in the early 1990s. I should point out here, in passing, that both safeguards agreements and additional protocols are focused on nuclear material — and therefore, the Agency's legal authority to investigate possible parallel weaponization activity is limited, absent some nexus linking the activity to nuclear material.

Today only 70 countries have additional protocols in force. This limited number, eight years after the adoption of the protocol, falls well short of our goal of universal application. The Agency's verification efforts will not be regarded as fully "effective" as long as its inspection rights remain uneven. The additional protocol must become the universal standard for verifying nuclear non-proliferation commitments.

The central purpose of verification is to build confidence. We have recently come to realize that, in cases where proliferation concerns have created a confidence deficit, even the access rights of the additional protocol may not be sufficient. In such cases, additional "transparency measures" may be required.

A case in point is the IAEA's verification work in Iran. Over the past three years, we have compiled a detailed picture of most aspects of Iran's past and current nuclear programme. But given that the programme was concealed for nearly 20 years, and that a number of open questions remain, we have asked that Iran provide additional transparency measures — beyond the confines of the protocol — to enable the Agency to resolve these questions, and to provide the required assurance about the peaceful nature of Iran's nuclear programme.

Another key to making verification effective is sufficient resources. IAEA verification today operates on an annual budget of about \$120 million — a budget comparable to that of the Chelsea football club. With these resources, we oversee approximately 900 nuclear facilities in 71 countries. When you consider our growing responsibilities — as well as the need to "stay ahead of the game" — this clearly is a "shoestring" budget.

With additional funding, we could support R&D on new technology for detecting clandestine nuclear facilities and activity. We could expand our laboratory analysis capabilities. We could more readily purchase satellite imagery. And we could supply our inspectors with better tools for on-site analysis and communication.

Whether the issue is access, information, or resources, for the IAEA to be fully effective, the governments we serve must provide a level of support equal to the challenges we face. We are only as effective as we are allowed to be.

Step Three: Strengthening the Credibility of Enforcement Mechanisms

A third step would be to strengthen the mechanisms that deal with non-compliance. The potential for being reported to the UN Security Council has clearly acted as an incentive for compliance in some situations. However, this may not always be the case. We should recall that the actual reporting of North Korea to the Council, first in 1992 and again in 2003, led to little to no action.

To be effective, the Security Council must be ready at all times to engage promptly to address situations that are "likely to endanger the maintenance of international peace and security". This will provide the Council with the opportunity and the time to make full use of its extensive authority, as a first choice, to settle disputes by peaceful means.

In that context, I believe the Council should be quick to respond to any case of withdrawal from the NPT. The most likely motivation for such a

withdrawal is to pursue the development of nuclear weapons — a course of action that obviously could have serious implications for international peace and security. For a case in which a country has withdrawn from the NPT, the minimum required action by the Council should be a prompt review of the consequences of that withdrawal, and a serious effort to establish a framework for the settlement of the underlying disputes.

Step Four: Protecting Nuclear Material

A fourth step is to accelerate our efforts to protect existing 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; however, as I understand it, a good part of this work is still to be completed.

The importance of this work has been accentuated by the ambition of extremist groups to pursue nuclear and radiological terrorism. In the past 10 years, the IAEA's Illicit Trafficking Database has recorded over 650 cases that involve efforts to smuggle such material. Fortunately, only a relatively small number of these cases 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, they would not think twice about using it.

Several agreements have been reached on how to enhance nuclear security. The UN Security Council adopted resolution 1540 last year. The *International Convention on the Suppression of Acts of Nuclear Terrorism* was adopted a few months ago. 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 recently, parties to the *Convention on the Physical Protection of Nuclear Material* agreed on major changes to better protect nuclear facilities and material.

It is imperative that countries implement these measures as fully and as early as possible. We are in a race against time.

Many countries are also 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.

These and other steps are helping to reduce the risks posed by existing nuclear material. But much remains to be done. Of the research reactors currently in operation, 99 still use HEU enriched to 90% or higher — the kind of material that could be used directly for nuclear weapons.

The manner in which to deal with plutonium stocks also remains an open question — whether to burn the plutonium in mixed oxide (MOX) fuel to generate electricity, or to mix it with high level radioactive waste for disposal in a vitrified form. One innovative but technologically feasible approach for the longer term may be the use of proliferation-resistant forms of plutonium fuel.

Step Five: Accelerating Disarmament Efforts

A fifth step is to accelerate disarmament efforts. This is the responsibility of the nuclear-weapon States. In my view, they should lead by example, and their efforts should by necessity extend to the countries that remain outside the non-proliferation and disarmament regime altogether.

Although the nuclear-weapon States just five years ago reiterated their "unequivocal commitment" to disarmament, progress in recent years has been very slow — with 27 000 warheads still in existence, and with more than 30 countries as members of alliances that still rely on nuclear deterrence. This naturally is creating an environment of cynicism among the non-nuclear-weapon States.

At the 2005 NPT Review Conference, the parties failed to reach any agreement on how to respond to some of the most serious and urgent security threats of our time. What is worse is that at the UN World Summit in September, the final declaration did not even mention nuclear disarmament or non-proliferation.

One may legitimately ask whether we are a world in denial.

The current challenges to international peace and security, including those related to nuclear non-proliferation and nuclear arms control, cannot be wished away, and will continue to stare us in the face.

I believe it is crucial that we start to move forward — not only on the non-proliferation front, but with equal force on the disarmament front. A good start would be if nuclear-weapon States were to take action towards reducing their strategic reliance on nuclear weapons. This could begin by moving away from the Cold War status of maintaining these weapons on ready-to-launch or "hair-trigger" alert. With the Cold War well behind us, it seems quite baffling to many that the leaders of the major nuclear-weapon States, in case of a possible launch of a nuclear attack, would have a mere 30 minutes to decide whether to launch a "retaliatory" attack, and with it to threaten the devastation of entire nations in a matter of minutes.

Another important area in which we can make progress is with respect to the *Comprehensive Nuclear-Test Ban Treaty (CTBT)*. Ten years after its conclusion, it is still not in force. I will continue to call on all States to ratify the CTBT as soon as possible. But in the interim, until it enters into force, could we not agree on an indefinite moratorium — or, at a minimum, a moratorium of ten years?

Another important effort is the work towards a treaty banning the production of fissile material for nuclear weapons — referred to as the Fissile Material (Cut-Off) Treaty. Progress on this Treaty has been at a standstill for over a decade, due to divergent views. I believe, it would be far more productive to begin negotiations, and to seek ways and means to overcome differences as part of the negotiation process. And again, as with the CTBT, could we not agree, in the interim, on a moratorium on the production of such material?

Step Six: Developing an Alternative Approach to Collective Security

These and other steps — including major reductions in nuclear arsenals — will help to build confidence in the sincerity of our commitment to move towards nuclear disarmament. But complete nuclear disarmament will not be achieved before we develop a reliable alternative that eliminates the need for nuclear deterrence.

To date, no one has seriously taken up the challenge of developing such an alternative. In the wake of the Cold War, many of us were hopeful for a new global security regime, a regime that would be inclusive, effective, and no longer dependent on nuclear weapons. But regrettably, we have made little or no progress.

I believe this is a challenge we must confront. Civil society — including think tanks such as the International Institute for Strategic Studies — can play a major role in developing the concepts, approaches and strategies that could support such a regime.

What would such an alternative security regime look like? I do not claim to have all the answers, but I would propose several elements that would make the use of force — including the use of nuclear weapons — less likely as a means of conflict resolution:

- First, sustainable development for all. This means not simply throwing money at a development need, but simultaneously working to create the infrastructure, institutions and good governance that would eradicate poverty, curb human rights abuses and redress the sense of injustice and humiliation. There have been examples of such initiatives in recent years, with positive results; however, the funding is still much below what is needed. And it is not that we do not have the resources. In contrast to the \$1 trillion spent worldwide on armaments last year, less than 10% — only about \$80 billion — was spent on official development assistance.
- Second, economic and sociopolitical deterrence. By this I mean building bridges of mutual economic, social and political dependency that make the use of force a least desirable option. For example, in the European Union, it is almost unthinkable that its members would resort to the use of force against each other — not because they always agree, but because they have removed the military dimension from the equation of how to resolve their differences.
- Third, preventive engagement. The international community must be able — through the United Nations as well as through regional organizations — to engage early, before conflicts escalate and fester, and before we are left only with the military option

Fortunately, globalization has given us many tools to achieve these goals. While globalization has increased and deepened many of the challenges we face, with it also come opportunities to address these challenges. This is equally true in the security area. While the threats have become more acute, the remedies have become more accessible. There is both an urgent need and an opportunity to move from a security system based on mutual assured destruction to one based on mutual assured security.

The irony is that we know the problems and we have the solutions. What is needed is a change of mindset and a new course of action, which is yet to come.

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