

# Verification of nuclear non-proliferation: Securing the future

*International efforts to make the nuclear non-proliferation regime more effective show signs of bearing fruit*

by Dr Hans Blix

**M**omentous changes over the past several years are first beginning to colour the course of international relations. Frequently presented in images and symbols — the fall of the Berlin Wall, nuclear inspection teams at desert sites in Iraq, national flags raised in capitals of a newly formed commonwealth — the events have ushered in unprecedented opportunities, and critical new challenges, for the international community. What implications do they hold for world peace and security, particularly within the context of nuclear developments?

What we have seen so far is generally hopeful. In my view, it augurs well for securing even greater adherence to the nuclear non-proliferation regime that States collectively have built over the past 30 years to stop the spread of nuclear weapons. Underpinned by an intricate web of legal instruments, the regime includes the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), IAEA safeguards agreements, regional nuclear-weapon free zone treaties, nuclear disarmament measures, and nuclear export restrictions. To varying degrees, we have witnessed positive developments in each of these areas in recent years.

The generally optimistic outlook, however, must be tempered because of some major impediments.

Among them are deeply rooted regional tensions in the Middle East and parts of Asia, and ethnic division in regions of Europe. Secondly, there is the case of Iraq, whose extensive clandestine nuclear programme raised serious questions about how close other countries might come to acquiring the materials and technology to develop a nuclear weapon. Thirdly, the break-up of the Soviet Union has added some troubling dimensions to non-proliferation and verification issues.

There are signs that these, and other, difficult challenges are leading to greater vigilance and resolve within the international community. In my view, the post-Cold War's more temperate global climate is favouring the cultivation of some new approaches that alongside traditional ones will serve to make the nuclear non-proliferation regime more effective.

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## Nuclear non-proliferation

Over the past 30 years, efforts toward preventing the proliferation of nuclear weapons to further countries have been rather successful, a fact frequently overlooked. The number of States having overt nuclear-weapons programmes has stayed at five. A few others are thought to have the capability of assembling nuclear weapons in a short time, if they do not already have them.

Historically less successful have been attempts to halt vertical proliferation — to reduce the number of nuclear weapons among the five declared nuclear-weapon States. Of late, the situation is changing. The United States and Russian Federation are moving to make very substantial cuts to their tremendous nuclear stockpiles, which no longer are menacingly targeted at each other. One can even hope that the prevailing climate will lead all nuclear-weapon States to more deeply question the need for costly nuclear tests they have conducted at the rate of one every nine days since 1945.

Why have most States decided against developing nuclear weapons? The answers vary, and are tied to a number of disincentives and national political considerations.

One practical disincentive is technological. Despite the very special case of Iraq, most developing countries still are not at a technological level where they could develop a nuclear weapon. The lesson of Iraq, however, is that

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more and more of them could attain that level soon. Moreover, the risk exists, e.g. in the wake of the Soviet Union's dissolution, that a country might succeed in buying a nuclear weapon or weapons-grade material clandestinely.

Another disincentive is grounded in political and security considerations: A good number of States have found that they really would have no use for nuclear weapons, or even that it would be more dangerous to have them than to lack them. When countries like Sweden, Finland, Austria, and Switzerland adhered to the NPT, they may have come to just this conclusion.

In many cases, the lack of incentive for States to acquire nuclear weapons has been linked to the nuclear umbrella held for them by allies, for example in NATO or the Warsaw Pact. These States were able to adhere, as non-nuclear-weapon States, to the NPT. When the NPT was concluded some 25 years ago, such adherence was felt to be particularly important as regards the two World War II enemy powers.

Another disincentive to proliferation is related to the rules of nuclear trade. Again, the case of Iraq has proved instructive, and catalytic. Iraq's success in building a secret foreign procurement network that skirted nuclear trade restrictions prompted States to take a closer look at rules governing the export of sensitive nuclear technology, material, and equipment. Existing restrictions set by supplier countries impeded Iraq's efforts, but did not thwart them.

In light of the revelations, the UN Security Council, in a recent summit statement, has explicitly endorsed the importance of export controls, and major nuclear suppliers have adopted a number of initiatives.

One area that suppliers have examined concerns "dual-use" nuclear-related technologies, which can be items ranging from chemicals to industrial machine tools having both civilian and military applications. At a meeting in Warsaw in early April 1992, the 27 countries adhering to the existing Nuclear Suppliers Guidelines adopted a comprehensive arrangement that they believe will fill a significant gap in controlling the export of these items. They further reached agreement on a common policy of requiring the application of comprehensive IAEA safeguards to all current and future nuclear activities as a necessary condition for all significant new nuclear exports to non-nuclear-weapon States.

The question of export restrictions as such has not been pursued in the IAEA. But it has examined the other side of the coin, namely assurances of supply for peaceful purposes and their linkage to acceptance of effective safeguards. Given the now more apparent relevance of such linkage, it is conceivable that multilateral

discussions could bear some fruit in reaching a genuine understanding on this difficult question.

The NPT offers incentives for adherence by promising easier transfer of peaceful nuclear technology to States willing to renounce nuclear weapons. For most developing countries, which have decided they have neither the need for, nor the means of, developing such weapons, the actual "cost" of adherence has been negligible. At the same time, it must be admitted that the "carrots" — in the form of nuclear technology transfer — have been moderately sized. For more technologically advanced countries, on the other hand, access to nuclear technology and fuel-cycle services such as enrichment has been of significant benefit.

### Regional approaches and initiatives

The desire to broaden, and in some cases customize, the non-proliferation regime is reflected in the interest countries are showing in regional approaches.

In Southeast Asia and Latin America, the Rarotonga and Tlatelolco Treaties establish nuclear-weapon-free zones incorporating requirements for parties to accept comprehensive IAEA safeguards. In southern Africa, active discussions on such a zone now have started, buoyed by the recent adherence to the NPT of Mozambique, South Africa, Tanzania, Zambia, and Zimbabwe.

A good example of mutual openness and confidence-building has been set by Argentina and Brazil. Their acceptance in late 1991 of comprehensive IAEA safeguards to supplement their own bilateral joint system of nuclear controls is likely to lead soon to their full adherence to the 25-year-old Tlatelolco Treaty. Additionally, Cuba has declared it is actively considering signing the Treaty. This would be another major step towards bringing it into effect.

A few countries, however, still refrain from entering into legally binding non-proliferation commitments, basically for reasons relating to their security considerations. In some of these cases, special tailor-made solutions may be needed. Peace talks now under way on the Middle East offer a forum for the discussion of a security and non-proliferation regime in that region. All the States in the region are on record as supporting a nuclear-weapon-free zone.

In the Middle East, such a zone probably will require verification measures going considerably beyond those now practiced under NPT-type safeguards. Just what kind of safeguards verification would be necessary in the Middle East is one question I am now exploring with

governments in the region. Certainly, some form of IAEA safeguards could be part of the verification measures.

During my talks with them in early 1992, political leaders in two of the region's NPT countries, Libya and Syria, expressed assurances of their governments' willingness to co-operate fully with the IAEA in implementing safeguards on nuclear activities in their countries. Libyan officials stated their readiness to invite the IAEA to send inspectors to any site it might wish to visit. Syria, which informed me during the talks of its readiness to sign an NPT-safeguards agreement with the IAEA, did so in February 1992.

In the Far East region, the willingness of the Republic of Korea and the Democratic People's Republic of Korea (DPRK) to negotiate a special arrangement calling for mutual nuclear inspections must be seen as a positive sign. The DPRK's ratification in April 1992 of the comprehensive safeguards agreement it signed with the IAEA is another welcome step.

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### Verifying nuclear non-proliferation

Measures to verify the commitments of States to nuclear non-proliferation historically have been products of their times, and the influence of recent global developments is no exception.

At the end of the 1960s, the IAEA's verification system was designed to fit the area where it was felt that reassurance was most needed — namely industrially advanced States which were or would be capable of making nuclear weapons. One effect of this, however, is that today the larger part of verification efforts is aimed at Western Europe, Canada, and Japan, where there is a large concentration of fissionable nuclear material. While verification here is certainly desired, the political stability of the countries there gives little ground for concern.

Today, other areas are prompting international interest in thorough verification. Consequently, the IAEA is trying to apply its limited resources accordingly, with the aim of strengthening the overall verification system. Some steps already have been taken, and other measures are being considered by the IAEA Board of Governors.

The Iraq case — the only known instance of a clandestine violation of comprehensive safeguards — naturally and necessarily has led to an extensive and searching debate because of its dimensions. Its most important reminder is that the verification system must be geared to detect *undeclared* nuclear material, and to do so not only in declared installations, but also in *undeclared* facilities. Iraq's multibillion dollar programme, of course, was not declared. In fact,

its scope does not appear to have been known even to foreign intelligence organizations.

While it is not certain that inspection systems can be devised to guarantee detection of nuclear programmes developed indigenously and secretly in closed societies such as Iraq's, it is clear that several measures can be taken to considerably reduce the risk that they will escape detection. When the State itself refrains from declaring and identifying its secret activity, the crucial point is to obtain credible information about it and where it is located. Inspectors cannot and will not be allowed to roam the territory of inspected States in a blind search for possible hidden nuclear material and facilities. Information must be obtained through other means.

Measures being taken at the IAEA include additional reporting to the IAEA by States on nuclear-relevant exports and other matters. The Board of Governors already has reaffirmed the IAEA's right to request inspections to identify undeclared nuclear material where there are reasons to believe that such material exists and explanations have not clarified the matter. Should information uncover a nuclear programme in a given State that should have been declared, but was not, the State may well refuse an inspection. Such a case would most likely pass through the IAEA Board of Governors and be transmitted to the United Nations Security Council for appropriate action.

Through their greater capacity for detection, safeguards provided with sharper teeth should have more credibility and a greater deterrent effect. Not only is this needed after the shock of Iraq, it is also needed in a world where we are seeking drastic disarmament and a more universal non-proliferation regime. A world seeking to free itself from nuclear weapons needs to guard itself well against surprises.

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### Verification and disarmament

Whereas the IAEA to date has not been entrusted with any role in the disarmament area, it could serve a valuable verification function under certain circumstances.

No nuclear weapons have been dismantled yet, and we do not know what plans nuclear-weapon States are contemplating for the verification of the more far-reaching measures to reduce nuclear arsenals as now expected. It may well depend upon the nature of the disarmament measures.

Verification of the actual *dismantling* of nuclear weapons will take place in the military-industrial sector, and can only be entrusted to personnel from nuclear-weapon States. However, if it were to be agreed that at some stage

recovered fissionable material should be transferred to the civilian sector, suitably designed IAEA safeguards could be used to verify the undisturbed storage of this material or its peaceful use in various types of reactors.

There will be growing stockpiles of plutonium from the reprocessing of reactor fuel and from disarmament. In this decade, stockpiles of fissile plutonium from reprocessing are estimated to approach 110 tonnes. Another estimated 200-210 tonnes of fissile plutonium, and between 900 and 1050 tonnes of highly enriched uranium, reportedly are in nuclear warheads that could be dismantled. This situation in my view calls for policies that will allow us to do away with the plutonium by using it in reactors for producing electricity. Given the resources, the IAEA would have the ability to verify such use and storage. Expanding nuclear disarmament might embrace a cutoff of production of high-enriched uranium and of plutonium for military use. Such bans, too, could be monitored and verified by the IAEA.

### Some special questions

Some special verification questions arise from the Soviet Union's breakup and the emergence of many independent States. The situation has not yet stabilized. The USSR was a nuclear-weapon State and party to the NPT. In this capacity, it could freely deploy nuclear weapons.

While it is clear that the Russian Federation will continue as a nuclear-weapon State party to the NPT, it does not yet seem absolutely clear what the status of other States of the former USSR will be. Some, like the Baltic States, may not have any nuclear weapons on their territories, and they seem to be ready to adhere to the NPT as non-nuclear-weapon States, and to submit any peaceful nuclear activities they may have to comprehensive IAEA safeguards.

Concerning former republics having tactical nuclear weapons, it has been reported that before this summer the weapons will be moved to the Russian Federation. This may enable several of these former republics to join the NPT as non-nuclear-weapon States.

A special question arises with respect to the Ukraine, Belarus, and Kazakhstan, which apart from the Russian Federation have strategic nuclear weapons on their territories. The actual removal of these weapons from these three States does not seem to be envisaged for the short term. However, as we know from cases of several European members of NATO or the former Warsaw Pact, the presence of nuclear weapons on a State's territory does not prevent it

from becoming a non-nuclear weapon State party to the NPT if the weapons are controlled by a nuclear-weapon State. Hence, the manner in which these weapons will be controlled in Ukraine, Belarus, and Kazakhstan appears to be decisive for their possible adherence to the NPT as non-nuclear weapon States.

Concerns also have arisen from media reports during the last year about the risk of nuclear bombs, sensitive nuclear equipment or technology, and nuclear scientists "trickling" from the now less severely controlled States of the former USSR. With respect to the scientists and engineers, the right approach must be the one currently being taken, namely to provide incentives for them to work in the peaceful nuclear sector or in nuclear disarmament-related work.

We must assume that the risks of clandestine transactions relating to hardware and technology increase in periods of disorganization. Fortunately, despite a flood of reported cases, no hard evidence seems to have been presented of actual occurrences.

### Securing the future

On various fronts, international efforts to fortify the nuclear non-proliferation regime are responding to challenging conditions. A combination of factors are at play, and solutions must address a range of interests. But the global climate is right for sowing seeds of constructive change.

Potential dividends are vast. A drastic lessening of political tensions and of military arsenals would free tremendous resources needed to solve other global problems — from malnutrition and disease to environmental pollution and energy shortages. A world in which half of its people live in poverty and a minority enjoys improving high standards of living can be neither secure nor stable.

Since the end of World War II, more than 150 wars have been fought, taking the lives of 20 million men, women, and children, mostly civilians. They were financed by worldwide military expenditures among industrialized and developing countries alike that have soared over the past 47 years to an estimated US \$900 billion a year.

These sad and startling numbers cannot be erased from our legacy. But the international climate should enable us radically to strengthen safety in the relations between States and reap the benefits from it. Effectively verified nuclear disarmament and non-proliferation are essential parts of that safety. The IAEA can play a significant role in the new international safety regime.