Future Challenges for Nuclear Non-Proliferation Instruments

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(https://www.iaea.org/sites/default/files/styles/hd_1920x1080/public/default_images/statement-default.jpg?itok=E1vf14LB)

2003 has been a historical year for the IAEA and the nuclear non-proliferation regime. It began with the expulsion of the Agency's inspectors from the DPRK followed by the notification on January 10 of DPRK's withdrawal from the Treaty on the Non-Proliferation of Nuclear Weapons (NPT).

In February 2003 Agency inspectors, lead by the Director General, visited for the first time a centrifuge enrichment pilot plant at Natanz in Iran which was almost ready to begin operation. In the ten months that followed, the IAEA progressively

discovered the extent of the Iranian nuclear programme which had been concealed for almost two decades.

And finally, on the 19th of December 2003, Libya announced its decision "to eliminate... materials, equipment and programmes which lead to the production of internationally proscribed weapons", reaffirming that it was bound by the NPT and that it was "ready to receive the visit of inspection teams to verify its compliance with those commitments".

In what follows some of the lessons learned from these major events will be analyzed and some corrective actions that need to be taken in order to strengthen the non-proliferation regime will be identified.

Although the events associated with Iraq have had a profound impact on the world in the past year, this paper does not intend to focus on verification in Iraq, where most Agency activities were conducted under the relevant United Nations Security Council (UNSC) resolutions rather than under its comprehensive safeguards agreement (CSA).

The Lessons Learned

DPRK

Although the DPRK became a party to the NPT in late 1985, the DPRK did not conclude a comprehensive safeguards agreement (CSA)[3] (/NewsCenter/Statements/DDGs/2004/goldschmidt17032004.html#ftn3) with the Agency until 1992.

Early in the implementation of comprehensive safeguards in the DPRK, in the course of verifying the correctness and completeness of the DPRK's declarations concerning nuclear material and facilities, inconsistencies were discovered by the IAEA. The DPRK rejected the Agency's requests for access to sites and information which could have resolved these inconsistencies, and on 12 March 1993 announced its intention to withdraw from the NPT. On 11 June 1993, one day before its withdrawal was to take effect, the United States and the DPRK issued a Joint Statement on achieving peace and security on a nuclear-free Korean

peninsula, and the DPRK "suspended the effectuation" of its withdrawal from the NPT. Under the resulting "Agreed Framework" the DRPK agreed, in exchange for monthly deliveries of heavy fuel oil and the supply by an international consortium[4] (/NewsCenter/Statements/DDGs/2004/goldschmidt17032004.html#ftn4) of two 1000 MWe light water reactors for generating electricity, to "freeze" its graphite-moderated reactors and related facilities (consisting of one 5 MWe reactor and two larger reactors under construction, a reprocessing plant and a fuel fabrication plant). It also agreed to remain a party to the NPT and to come into compliance with its comprehensive safeguards agreement before key components of the light water reactors were delivered. The IAEA was requested by the United Nations Security Council to verify the DPRK's compliance with this freeze.

In the meantime, Agency safeguards activities were restricted to only those relevant to monitoring the freeze. The Agency was unable to conduct activities associated with determining the correctness and completeness of the DPRK's initial report.

In October 2002, following bilateral talks, the US announced that the DPRK had acknowledged that it had a "programme to enrich uranium for nuclear weapons". The US subsequently cut off its supply of fuel oil to the DPRK. In late 2002, Agency inspectors monitoring the freeze were expelled. On 10 January 2003, the DPRK announced that it lifted the moratorium on its 1993 notification to withdraw from the NPT, considering therefore that its withdrawal from the NPT would take effect one day later, and asserted its right to pursue a nuclear weapons programme for security reasons. On 12 February 2003, the IAEA Board of Governors reported the DPRK's non-compliance to the UN Security Council.

It should be stressed that this is the *very first time* that a country has "de facto" withdrawn from the NPT.

The international community is thus confronted with the case of a State that over the last 12 years has been reported by the IAEA to be in non-compliance with its Safeguards Agreement, has announced its withdrawal from the NPT and has admitted, or at least threatened, to be pursuing a nuclear weapons programme. It

is now more than one year since the DPRK declared its withdrawal from the NPT and many months since it indicated that it had reprocessed the spent fuel from its 5 MWe graphite reactor and separated the weapons grade Pu that it contained. Yet there has been neither a UNSC Resolution nor even a UNSC Presidential Statement condemning the DPRK.

This raises fundamental questions: what circumstances have made this possible and what measures should be taken in order to avert a similar situation in the future?

One could argue that this (hopefully temporary) deadlock is largely due to the fact that there is no internationally endorsed response that would be implemented automatically when a country is either found in non-compliance with its safeguards agreement or withdraws from the NPT. Therefore, the consequences of these actions for such States depend to a large extent on the way any of the five permanent members of the UN Security Council decides (or not) to use its veto right.

Iran

The findings made by the IAEA in Iran in 2003 have raised additional concerns. The IAEA Director General's Report to the Board of Governors dated 10 November 2003[5] (/NewsCenter/Statements/DDGs/2004/goldschmidt17032004.html#ftn5) states that "Iran has acknowledged that it has been developing, for 18 years, a uranium centrifuge enrichment programme" and that Iran has admitted "that it failed to report a large number of conversion, fabrication and irradiation activities involving nuclear material, including the separation of a small amount of plutonium".

The Report further states that "in the past, Iran has concealed many aspects of its nuclear activities, with resultant breaches of its obligation to comply with the provision of the Safeguards Agreement".

Even though Iran had informed the Agency in October 2003 that it had now adopted a policy of full disclosure and transparency; even though Iran has signed on 18 December 2003 a protocol additional[6]

(/NewsCenter/Statements/DDGs/2004/goldschmidt17032004.html#ftn6) (AP) to its CSA and decided to act in accordance with the protocol pending its entry into force; and even though Iran has decided voluntarily to suspend all enrichment related and reprocessing activities, a number of Member States of the IAEA are not convinced that Iran's long-concealed nuclear programme was, and maybe still is, not aimed at developing a nuclear weapon capability.

The international community has become increasingly concerned that a country operating for instance a centrifuge enrichment plant to produce low enriched uranium (LEU[7] (/NewsCenter/Statements/DDGs/2004/goldschmidt17032004.html#ftn7)) for peaceful purposes could construct a replicate of such a facility in a concealed location or, if it decided to withdraw from the NPT, reconfigure very rapidly any such facility in order to produce the high enriched uranium (HEU) required to produce nuclear weapons.

President Bush, in his speech of 11 February 2004 to the National Defense University[8] (/NewsCenter/Statements/DDGs/2004/goldschmidt17032004.html#ftn8), underlined that the NPT has a loophole in the sense that it allows States "to produce nuclear material that can be used to build bombs under the cover of civilian programmes".

Is it possible to address these concerns while respecting Article IV of the NPT which, inter alia, states that "all the Parties to the Treaty undertake to facilitate, and have the right to participate in, the fullest possible exchange of equipment, material and scientific and technological information for the peaceful uses of nuclear energy"? This paper will explore some possible responses.

Libya

Libya became a party to the NPT in May 1975 and its comprehensive safeguards agreement entered into force in July 1980. Prior to 20 December 2003, Libya's declared nuclear programme consisted essentially of a 10 MW(th) research reactor in operation since 1980, and a critical assembly.

Unexpectedly, on 19 December 2003, Libya announced its decision inter alia "to eliminate... materials, equipment and programmes which lead to the production of internationally proscribed weapons," and a few days later informed the Agency that Libya had been secretly engaged for two decades in the development of a uranium enrichment capability. This included importing nuclear material as well as conversion and centrifuge equipment, and the construction of a now dismantled pilot scale uranium enrichment centrifuge facility. Libya also informed the Agency that it had obtained documents related to nuclear weapons design and fabrication.

The Agency's verification activities that have taken place since last December with Libya's cooperation have confirmed the limitations in the Agency's ability to discover, in such a country, undeclared nuclear material, small scale facilities and related activities, especially in the absence of an additional protocol in force. It also revealed that Libya had relied heavily and successfully on an extensive illicit trade network in nuclear-related technology, equipment and material, including nuclear weapons design. These findings have highlighted the need for all States to improve their control of the export and transit of sensitive nuclear technology, materials, information and expertise that could support the development of weapons of mass destruction.

The Need for Corrective Actions

The Need to Improve Export Controls

An increasing number of exporting States are considering strengthening their export controls to better ensure that they do not contribute, either directly or indirectly, to the development of non-peaceful nuclear activities in other States. Some such exporting States have expressed their intention to require, as a necessary pre-requisite for export of sensitive nuclear fuel cycle related know-how, design, equipment and technology (particularly in the areas of uranium enrichment and plutonium separation), that the recipient State has an additional protocol in force, or even that the Agency has drawn and can maintain the conclusion of the absence of undeclared nuclear material and activities in that State.

Where needed, States should strengthen the implementation of their export controls and encourage and assist other States in doing the same. Special attention should be given to export controls with respect to custom-free zones or installations situated in locations considered as extraterritorial where undeclared nuclear material and single or dual use equipment can be stored (and possibly even manufactured or assembled) without having to be declared either at the time of their import or export. These transit havens have been used extensively by intermediaries and front companies active in illicit nuclear trade networks. These undeclared "transits" are even easier to conceal in countries that either have no comprehensive safeguards agreement in force or have a small quantities protocol[9] (/NewsCenter/Statements/DDGs/2004/goldschmidt17032004.html#ftn9) which holds in abeyance most of the provisions of their safeguards agreement.

Reporting on International Transfers of Specified Non-nuclear Material and Equipment

Information on exports of specified equipment and non-nuclear material is essential for the Agency to evaluate the nuclear-related capabilities of the importing States. In the absence of reports of this information by **all** exporting States, the Agency must rely upon the importing States to report the transfers and is limited to seeking indications of unreported imports from open or third party sources of information only.

Many of the documents and single or dual use equipment used for the undeclared programmes of Iran and Libya originated from States that were not required to report the exports to the Agency. It is therefore essential for exporting States to broaden their reporting to the Agency, in particular by concluding an additional protocol.

The Agency is actively investigating the recently revealed worldwide supply routes and sources of sensitive nuclear technologies and equipment. It is of vital importance that States cooperate with the Agency to fully investigate, uncover and ultimately dismantle the existing networks. States should also undertake to

provide to the Agency further information, for example on denials of exports of sensitive technology and on any known unsuccessful attempts to procure single or possibly dual use equipment.

It has recently been suggested that States should consider criminalizing, in their national laws, the illegal export or brokering of sensitive or dual use nuclear technology and equipment[10] (/NewsCenter/Statements/DDGs/2004/goldschmidt17032004.html#ftn10).

It is also important to have the means of preventing the transfer of sensitive technology while it is taking place. The Proliferation Security Initiative, launched by the United States in May 2003, calls for a variety of measures to interdict the transfer or transport of weapons of mass destruction, their delivery systems, and related materials. It is encouraging that a growing number of countries have indicated their support for this initiative and their intention to apply its principles.

The Need To Improve The Agency's Ability to Discover Undeclared Activities at Undeclared Locations

As indicated above, recent events have clearly demonstrated that one of the greatest challenges to the Agency is to be able to detect indications of undeclared nuclear activities at undeclared, and possibly deliberately concealed, locations. Under comprehensive safeguards agreements alone States are required to provide information and access primarily with respect to nuclear material and facilities placed under safeguards, i.e., declared by States. As Agency access is confined to specific locations in these declared facilities, the Agency's ability to detect indications of undeclared activities, should they exist, is limited. In such cases, the Secretariat can only seek indications of undeclared nuclear material or activities from open or third party sources of information. Under an additional protocol States are required to provide the Secretariat with far greater information and access, which increases the Agency's capability to detect undeclared activities.

The Need for Universalization of the Additional Protocol

Therefore, as an important measure to stem the risk of proliferation, having an additional protocol in force should become the norm for all States, including

those without comprehensive safeguards agreements. As of the end of February 2004, out of 71 States with significant nuclear activities, 47 States did not yet have additional protocols in force[11] (/NewsCenter/Statements/DDGs/2004/goldschmidt17032004.html#ftn11) and 19 of those had **not** even signed it.

The information provided by an NPT non-nuclear weapon State (NNWS) pursuant to an additional protocol is extremely useful for assessing the State's nuclear programme. The information to be provided is also useful in allowing the Agency to get a better view of how the State's exports of specified equipment and non-nuclear material could unintentionally contribute to another State's covert nuclear programme. States with INFCIRC/66-type[12] (/NewsCenter/Statements/DDGs/2004/goldschmidt17032004.html#ftn12) agreements, despite the fact that they themselves may have nuclear weapons, should be called upon by the international community to conclude and implement additional protocols, particularly for the purpose of providing the Agency information of their export of non-nuclear material and specified equipment, as listed in Annex II of the Model Additional Protocol[13] (/NewsCenter/Statements/DDGs/2004/goldschmidt17032004.html#ftn13). This would demonstrate their commitments not to assist any other State with regard to nuclear related activities for non-peaceful purposes.

Although the Agency has an active outreach programme to encourage States to conclude safeguards agreements and additional protocols, stronger political influence by the international community could increase the likelihood that this will be achieved.

The Need For Greater Transparency

States with additional protocols in force are required to provide the Secretariat with far greater information and access, but even then the Secretariat's rights to information and access are limited and can be delayed to an extent sufficient to conceal nuclear material and activities before Agency verification can take place.

Therefore, even for States with comprehensive safeguards agreements and additional protocols in force, it is important that they fully cooperate, in a transparent manner, to facilitate the Agency's efforts to fulfil its mandate. Experience has shown that transparency of a State can save the Agency resources and bolster confidence in safeguards conclusions about the absence of undeclared nuclear material and activities in that State. Transparency to the Agency should be provided both with respect to the State's own nuclear programme and its commitment not to assist other States in nuclear proliferation.

One way to further support the verification activities of the Agency and to increase the efficiency, effectiveness and overall credibility of the NPT regime, would be for States with a CSA to consider the possibility of negotiating with the Agency, on a voluntary basis, appropriate instruments that would allow Agency inspectors and experts access rights to go anywhere, and interview anyone, at anytime. For States with a CSA and an AP in force, such voluntary confidence-building agreements would allow the Agency to draw more quickly the conclusion of the absence of nuclear material and activities that is necessary before implementing "integrated safeguards"[14] (/NewsCenter/Statements/DDGs/2004/goldschmidt17032004.html#ftn14) in the State and further reduce the verification burden for the State, the operators and the Agency because of the increased confidence in safeguards conclusions.

It would progressively set a precedent for what should, in the future, be expected from all non-nuclear-weapon States party to the NPT.

Response to Non-Compliance

Should there be prescribed consequences for a State found to be in non-compliance with its safeguards agreements? As a first step in addressing this issue without contradicting the spirit of Article IV of the NPT, the UNSC might consider, along the lines suggested recently by the UK Foreign Secretary Jack Straw[15] (/NewsCenter/Statements/DDGs/2004/goldschmidt17032004.html#ftn15), the merit of adopting a resolution stating the principle that a State found in non-compliance should no longer be entitled to construct or operate any sensitive nuclear fuel cycle installation such as uranium conversion, isotopic separation or

spent fuel reprocessing on its territory and any existing such facilities would have to be dismantled under IAEA supervision. However, such a State, once it is deemed to be again in full compliance with its NPT obligations (including an additional protocol), should continue to be entitled to the benefits of nuclear energy and therefore of operating nuclear power plants for heat and/or electricity production within its borders. The restriction on the State from developing its own independent nuclear fuel cycle would therefore have to be accompanied by guarantees of supply of fresh fuel assemblies at fair market price as long as the Agency is able to draw its annual conclusion of the absence of undeclared nuclear materials and activities in that State.

This fuel supply guarantee could be obtained from the Agency, backed by a group of supplier countries as foreseen in the IAEA Statute[16] (/NewsCenter/Statements/DDGs/2004/goldschmidt17032004.html#ftn16). Whether these fuel elements should be leased by the supplying State that would therefore retain ownership is a question to be considered. Under such a scenario, the exporting State would have the obligation, before delivering any fresh fuel, to require the return of spent fuel either to a NWS, or to an international or regional storage site under IAEA control. The extension of such an approach to other States could also be considered and encouraged on a voluntary basis.

Similarly, in order to avert the reoccurrence of the situation mentioned in section 2.1, the UNSC may also wish to consider what **automatic** international response would apply in case a State withdraws from the NPT.

The Need to Improve Nuclear Security and Prevent Illicit Trafficking

It is also essential for States to have adequate protection and control of their nuclear and other radioactive materials to prevent nuclear material trafficking. Ensuring nuclear security requires a consolidated effort along three lines of defense: prevention, detection and response. States must have effective capabilities to prevent theft or other forms of loss of control of nuclear and other radioactive materials, have effective measures in place to detect in a timely manner such events should they occur, and be able to efficiently and swiftly respond to such events or threats thereof. The Agency has an extensive programme to assist States in enhancing their nuclear security systems. The

Agency also invests considerable effort in enhancing cooperation with other international organizations, e.g., Interpol, Europol, WCO, and UN specialized institutions, to improve coordination of nuclear security activities at the international and regional level and facilitate information exchange relevant to nuclear security.

It is important for States to improve their reporting to the Agency on information regarding illicit trafficking of nuclear-related material, equipment and technology by providing any information available on the origin of the material or equipment and its possible destination. The Agency should be allowed immediate access to seized nuclear material for sampling and the material should be placed under Agency safeguards in accordance with a State's safeguards agreement.

Conclusion

The events of 2003 have presented challenges that will persist for the years to come and that will need to be addressed by the various stakeholders in the non-proliferation regime, including individual States, the UN Security Council, the IAEA and other international organizations (e.g., WCO, Interpol and the Nuclear Suppliers Group), through a variety of mechanisms.

It is the IAEA Secretariat's duty, in fulfilling its mandate, to report to the Board of Governors on generic weakness in the non-proliferation regime as well as on the limitations or "problem areas" in safeguards implementation and failures of States to comply with their safeguards commitments. In response, the Board should approve further measures to strengthen, as needed, the Agency's safeguards system and ensure that the Secretariat has the necessary authority as well as human and financial resources to implement effective safeguards.

Considering the major developments that took place during the year 2003, it has become widely recognized that the nuclear non-proliferation regime needs to be further strengthened. This can be done through a number of limited, but not insignificant, improvements to the IAEA safeguards system that, with the support of Member States, could and should be implemented without delay. Some more far-reaching measures have also been suggested, including those by President

George W. Bush, UK Foreign Secretary Jack Straw and Director General Mohamed ElBaradei[17] (/NewsCenter/Statements/DDGs/2004/goldschmidt17032004.html#ftn17). These will likely require thorough multilateral consultations and may have to address such broad issues as national security concerns, assurance of nuclear fuel supply on a large scale and possibly incentives such as economic and trade benefits that are the prerogative of Member States.

Also, as Director General ElBaradei has noted on several occasions[18] (/NewsCenter/Statements/DDGs/2004/goldschmidt17032004.html#ftn18), "a fundamental part of the non-proliferation bargain is the commitment of the five nuclear weapon States recognized under the non-proliferation treaty... to move toward disarmament." The commitment of the United States and the Russian Federation to verifiably withdraw 34 tons of plutonium from their respective nuclear weapons programmes is seen as a positive step; however more needs to be done. Progress also needs to be made in resuming the long delayed negotiation of the Fissile Material Cut-off Treaty. This treaty would verifiably halt the production of high enriched uranium and plutonium for weapons by all States. Such moves are essential for nuclear weapon States to demonstrate non-proliferation leadership by example.

Without correcting rapidly the loopholes of the NPT regime that have been identified, the risk will increase that, in the end, more States will be in a position to rapidly produce weapons grade nuclear material and assemble nuclear weapons whenever they so decide. Without the full support of the international community, the risk will also increase that sub-national terrorist groups with large financial resources and access to willing atomic scientists would be in a position, through middlemen and an illicit trafficking network of sensitive technologies, to acquire the nuclear material and expertise necessary to manufacture a crude explosive nuclear device.

The Agency can play a crucial role in facilitating the cooperation between States and other international organizations in the investigation of supply routes and sources of sensitive nuclear technologies, equipment and material.

It is only through full cooperation of all interested parties that the challenges to the non-proliferation regime can adequately be addressed.

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