The IAEA Additional Protocol: Improving the International Safeguards Regime

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Every state that is a party to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) is obligated to conclude a safeguards (verification) agreement with the International Atomic Energy Agency (IAEA). Following the Gulf War, and largely because of the previously undetected facilities and activities that were discovered in Iraq, the traditional form for this agreement was deemed inadequate. The IAEA then proceeded to draft a more comprehensive agreement form, the so-called Additional Protocol. Among other measures, the Additional Protocol requires the states to provide many new details in their declarations to the IAEA, enhances the access rights of the inspectors, and allows additional permissible technologies for the implementation of verification.

Yet while the Additional Protocol is a significant improvement over the original verification system, substantial loopholes still remain both in its provisions and in its implementation. Furthermore, ratification itself of the Additional Protocol is not mandatory, not even for states concluding new safeguards agreements with the IAEA. Many significant states, particularly those with potential capabilities to develop nuclear weapons, have not ratified the Protocol.

The following article describes the development of the Protocol and discusses the potential of its provisions for uncovering activities and materials that are illicit under the NPT.

Background

The NPT, which entered into force in 1970, includes the critical requirement of verification of compliance with its obligations by all non-nuclear weapons member states. The NPT assigned this task to the IAEA, which established and has since operated its verification mechanism, also called safeguards, in all states that concluded the obligatory agreements with the IAEA.

The original verification system is governed by IAEA document INFCIRC/153 (officially entitled *The Structure and Content of Agreements Between the Agency and States Required in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons*). This system is also known as "full scope" or "comprehensive" safeguards. As stated in Article III of the NPT, the IAEA verification system was established "for the exclusive purpose of verification of the fulfillment of [the State's] obligations assumed under this Treaty with a view to preventing diversion of nuclear energy from peaceful uses to nuclear weapons or other nuclear explosive devices."

In practice, the interpretation of this purpose was rather limited. Essentially, it translated into verifying declarations made by states of their facilities and nuclear materials, with a detailed accounting of these materials. What the verification system did not do is adopt a wider perspective and survey a state's territory in its entirety or examine the sites where the facilities were located. Moreover, no activities designed to search for undeclared facilities, sites, and materials were permitted. As an example of this shortcoming, during their visits to the Tuwaitha site in Iraq, the inspectors could see but could not question the purpose of undeclared facilities, where illicit activities were in fact taking place before the Gulf War.

The sole exception to this restriction was a "special inspection," which had to be approved by the IAEA Board of Governors (BOG) and agreed to by the state in question.

Only one such case is on record, that of the request for a special inspection in North Korea; it was approved by the Board in 1993 but never conducted, since no agreement on the conduct of the special inspection could be reached with North Korea.

The failure of the IAEA to discover Iraq's extensive nuclear weapons development program prior to the Gulf War, and the disclosure of North Korea's failure to comply with its NPT obligations, prompted the Agency to work towards improving the existing verification system. The product of this work, also known as "Program 93+2" (since it was initiated in 1993 and took 2 years until its completion), both identified possible improvements under the existing arrangements, and produced the so-called "Additional Protocol" (formally designated: *INFCIRC/540: Model Protocol Additional to the Agreement(s) Between State(s) and the International Atomic Energy Agency for the Application of Safeguards*). The aim of the Additional Protocol was to enhance the existing verification system beyond its original scope.

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The Provisions of the Additional Protocol

Program 93+2 consisted of two parts, the second of which produced the text for the Additional Protocol.

The first part of the program was devoted to identifying verification measures that could have been implemented under the existing system, but were not. This part, which received the approval of the BOG in 1995, highlighted the following important "measures categories":

- Measures involving broader access to information. This would make the nuclear programs of states more transparent, thereby enhancing the level of assurance as to the peaceful nature of the programs. The measures would include: an expanded declaration; environmental sampling at areas selected from the locations to which the Agency has access; and improved information analysis.

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- Measures related to physical access: no-notice inspections. These are, however, of very limited scope.
- Measures for optimizing the use of the present system. These include: the utilization of advances in safeguards technology; increased cooperation with states and their State System of Accounting and Control (SSAC); and a more time efficient use of the safeguards implementation parameters, whereby existing authorizations for inspections are used more efficiently.

Although these measures are already allowed under the provisions of the previous comprehensive safeguards, their implementation demands a revision of the "subsidiary arrangements" between the state and the IAEA, under which all safeguards activities are executed.

Part 2 of the 93+2 plan offered proposals for a strengthened and more cost effective safeguards system, which would need additional "complementary authority" for implementation. The measures proposed in Part 2 include:

- Expanded declarations
- Increased physical access
- Improved auxiliary arrangements

The existing lapse whereby a state was required only to name "facilities" is corrected by requiring the presentation of complete and detailed descriptions of the facilities, as well as information about buildings and activities at the site where these facilities are located. Moreover, all current and projected nuclear R&D activities owned, funded, or authorized by the state that are related to nuclear fuel-cycle activities (with special emphasis on irradiated fuel reprocessing or uranium enrichment) and their status also

require declaring. The expanded declaration must include information on uranium mining, which was not included in the former arrangements. The declaration also extends to information on the production, import, and export of specific equipment and non-nuclear materials.

The increased physical access is designed to authenticate the declarations. This requires access, including no-notice access, to any place on a site where facilities are located, scheduled access to additional locations listed in the expanded declarations, and access to other locations not included in the declarations, but for the purpose of taking environmental samples only. It should be noted that the requirement for multiple-entry, long-term visas is incorporated under Part 1 provisions. These are essential for no-notice inspections.

The improved auxiliary arrangements contain many specifications that facilitate the work of the inspectors. These include the use of simplified procedures for designating inspectors and the use of independent, direct communication systems between the field and the IAEA headquarters.

The recommendations of the 93+2 program were incorporated as INFCIRC/540 and approved by the BOG in 1997. For the IAEA, the Additional Protocol thus goes a long way towards verifying the correctness of a state's declarations. Verifying their comprehensiveness is another matter.

The Strumbling Block: The Attempt to Verify an Absence

A fundamental obligation of the NPT is that "each non-nuclear-weapon State Party to the Treaty undertakes not to . . . manufacture or otherwise acquire nuclear weapons or other nuclear explosive devices." Certification of compliance with their NPT obligations is of extreme importance to those states that are viewed as having nuclear weapons ambitions, or those who need this recognition for various political and commercial reasons.

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The IAEA slipped twice in recent history, by giving or implying a "clean bill of health" to Iraq (immediately prior to the Gulf War) and to Iran. Hence the importance of the Additional Protocol, which takes a large step towards the ultimate goal of certifying that a state is not guilty of non-compliance with its obligations. Moreover, although the immediate purpose of the Additional Protocol is "to strengthen the effectiveness and improve the efficiency of the safeguards system," the real goal of the Additional Protocol provisions is to enable the IAEA "to draw conclusions about the absence of undeclared *nuclear material* or nuclear activities."

The Additional Protocol notwithstanding, the problem is yet far from resolved. Philosopher Karl Popper stated: "Theories are not verifiable but they can be corroborated." However, one corroborates by determining an existence, not an absence. How can one assure that a state is not doing something it ought not to do? Herein lies a principal – if not the main – challenge facing the safeguards system.

The procedure of verifying an absence of nuclear materials and activities at any given location consists of two phases: gaining access to the specific location, and searching this location for illicit (undeclared) materials and activities.

As regards access to declared places, the Additional Protocol provides that the IAEA shall have access to "any location [on a site or other declared location] on a selective basis in order to assure the absence of undeclared *nuclear material* and activities." However, the license is qualified by the assumption that "the Agency shall not mechanistically or systematically seek to verify the information referred to in [the declarations]." In everyday language, this means that the Agency has to behave "properly," i.e., not investigate every bit and piece of information it gathers and not turn the place upside

down in trying to verify information.

What about undeclared sites and locations? The first challenge is where to look. The IAEA is not permitted simply to go to places and conduct inspections, even if it determines that these places are capable of holding a nuclear facility. This would be an unacceptable nuisance to the inspected state. In order to increase the likelihood of identifying states and sites that could be harboring undeclared nuclear materials and activities sites, the IAEA instituted an improved information gathering and analysis system, designed to evaluate open source information and information provided by member states. In addition, it can operate location-specific and wide-area environmental sampling systems.

The technique of environmental sampling is employed to detect materials emitted into the environment from nuclear processes. It is used, according to the Additional Protocol, "for the purpose of assisting the Agency to draw conclusions about the absence of undeclared *nuclear material* or nuclear activities." Environmental sampling can be done, according to the Additional Protocol, both at specific locations and as wide-area sampling (although the employment of the latter method has yet to be approved by the BOG).

It should be stressed, however, that while location-specific environmental sampling is an excellent means of detection, it is not an incontrovertible proof of guilt, since the findings could have a perfectly innocent explanation. On the other hand, the absence of a positive finding is not a proof of innocence. Indeed, a "false-negative" finding, that is, not finding something that is actually present, is the bane of the attempt to prove an absence – the so-called "negative verification."

Wide-area environmental monitoring is an entirely different issue. It can be an efficient way of detecting large-scale activities, particularly in a small state that has no other declared activities that might mask the emissions from undeclared activities. However, setting up a wide-area monitoring system in a large state that has only a small-scale program would be very costly and inefficient, and have only a small probability of detecting well-hidden activities. If undeclared activities are detected, the next step is to pinpoint their original location, i.e., the source of the emissions detected by the monitoring system, which by itself is no small challenge.

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Once a location has been identified as a possible site for undeclared activities, the Agency confronts the hurdle of gaining access to this location. Beyond the existing provision of special inspections, the Additional Protocol can only encourage the goodwill of the states themselves: "Nothing in this Protocol shall preclude [the state] from offering the Agency access to locations in addition to those referred to" specifically in relevant articles of the Protocol.

When and if access to a specific location has been granted, the final task is to uncover the illicit activities and materials. Good concealment and other means of diversion on the part of the inspected state could hinder or prevent any discovery, to the chagrin of the inspectors and their organization.

Looking for a Solution

Reconciling the demand by the IAEA Member States to pronounce them clear of any violation of their NPT obligations with the objective difficulties of verifying an absence is a difficult task. The method the IAEA is contemplating is to employ a "concept of sufficiency," or in other words, to determine when "enough is enough." According to this method, the IAEA will announce the state's full compliance when Agency authorities think they have done enough to assure themselves that there is no reason to doubt that the inspected state's declarations are both truthful and complete. They will be assisted in this endeavor by acquiring supplementary information from open sources and from other states.

In resorting to this method, the Agency is charting a different path,

from the previous goal of comprehensive objective assessments to the more attainable goal of subjective evaluation, as the only means of achieving its end. There is no way that the success of this method can be evaluated a priori. On the one hand, it could work well, if the Agency successfully obtains and assesses all the additional information it wants. On the other hand, it could fail miserably if, in spite of all the verification efforts, a state would acquire a nuclear capability. This would be disastrous both for the IAEA and for the world. The case of Iraq clearly demonstrates the consequences of such failure.

The verification regime in Iraq, mandated by the Security Council, is much stronger than that of the Additional Protocol. Even so, there were numerous acts of concealment by the Iraqis, denials of access to locations and to records, and instances of obstructing the inspectors' work. Based on what it knew, the Agency was ready to declare its mission to "destroy, remove, or render harmless" Iraq's nuclear ambitions complete, just before the defection of Iraqi General Hussein Kammel in August 1995. The additional information that he and the Iraqis subsequently provided proved this readiness to be wrong. This could happen again in Iraq and in other states if judgment, in lieu of objective evaluation, is relied upon.

What, then, is the way out of this quandary? There should be no doubt that the Additional Protocol is a big improvement over the original "comprehensive" safeguards system. One should fully utilize its benefits, albeit without attributing to it authority it does not have. Both the IAEA and its Member States must realize that an objective clean bill of health can be given only in certain and limited cases, e.g., when a state is very small, has no scientific or technical infrastructure, and is economically unable to devote the necessary means to developing a nuclear capability. In all other cases, the IAEA, having done all it can under the provisions of the Additional Protocol, should clearly state the facts, adding that it discovered nothing that contradicts the state's declarations. This is the utmost that the Agency can or should purport to do.

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Nonetheless, one should not forget an additional benefit of the Additional Protocol, the effect of deterrence it exerts, precisely because of its much-expanded investigative capabilities. A state willing to conceal nuclear materials and activities is taking a considerable risk when permitting Additional Protocol verification on its territory. Accepting this regime is a commitment for the present as well as for the future. That could be the reason why not many "important" states (outside the European Union), that is, the states with a clear potential to develop a nuclear capability, have ratified the Additional Protocol. In the Middle East, as of October 2002, no state has ratified the Additional Protocol, with the exception of Jordan. Important states that are parties to the NPT, such as Egypt, Iran, Iraq, Libya, and Syria, have not done so, and there is no indication that they will. Moreover, Saudi Arabia has not even concluded a "full scope" safeguards agreement with the Agency, in contravention of its basic NPT obligations.

In conclusion, the Additional Protocol is a significant improvement over the original regime. It is not, however, an absolute measure, and one should refrain from ascribing to it powers it does not have. With a clear, informed understanding of the IAEA and its authority, one can reap far more benefits than by exaggerating its powers.