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CREATION OF THE MODEL ADDITIONAL PROTOCOL

Frank Houck¹, Michael D. Rosenthal², and Norman A. Wulf³

ABSTRACT: In 1991, the international nuclear nonproliferation community was dismayed to discover that the implementation of safeguards by the International Atomic Energy Agency (IAEA) under its NPT INFCIRC/153 safeguards agreement with Iraq had failed to detect Iraq's nuclear weapon program. It was now clear that ensuring that states were fulfilling their obligations under the NPT would require not just detecting diversion but also the ability to detect undeclared materials and activities. To achieve this, the IAEA initiated what would turn out to be a five-year effort to reappraise the NPT safeguards system. The effort engaged the IAEA and its Member States and led to agreement in 1997 on a new safeguards agreement, the *Model Protocol Additional to the Agreement(s) between States and the International Atomic Energy Agency for the Application of Safeguards*. The Model Protocol makes explicit that one IAEA goal is to provide assurance of the absence of undeclared nuclear material and activities. The Model Protocol requires an expanded declaration that identifies a State's nuclear potential, empowers the IAEA to raise questions about the correctness and completeness of the State's declaration, and, if needed, allows IAEA access to locations. The information required and the locations available for access are much broader than those provided for under INFCIRC/153. The negotiation was completed in quite a short time because it started with a relatively complete draft of an agreement prepared by the IAEA Secretariat. This paper describes how the Model Protocol was constructed and reviews key decisions that were made both during the five-year period and in the actual negotiation.

1. BACKGROUND

The safeguards of the International Atomic Energy Agency (IAEA) under the comprehensive model NPT safeguards agreement, INFCIRC/153, have proven to be effective in deterring diversions of nuclear material from declared stocks. However, events in the early 1990s, especially in Iraq, demonstrated that the structure of the agreement and its implementation did not provide the IAEA with all of the tools necessary to build confidence that safeguards were being applied to all nuclear material in a State. In fact, a nuclear weapon program was discovered in Iraq in 1991 that had not been detected by the IAEA despite the implementation there of an INFCIRC/153 safeguards agreement and despite the fact that some undeclared activities were occurring near where IAEA inspectors routinely visited.

As a consequence, the IAEA initiated an intensive review of the NPT safeguards system in 1991. Then Director General Blix emphasized that to improve the IAEA's capabilities to detect undeclared activities the IAEA would need enhanced access to information and to locations. It would need much more information about a State's nuclear fuel cycle and its plans, and it could not rely exclusively on information provided by inspected states. Blix suggested that Member States share intelligence; provide information about exports; and that the Agency gather publicly available information.^{i ii}

Over the next five years, the IAEA Secretariat and its Member States reviewed the legal and technical basis for safeguards. The effort also engaged the Director General's Standing Advisory Group on Safeguards Implementation (SAGSI) and the Board of Governors (the Board). In 1996, the Secretariat sent to the Board a draft of a protocol additional to comprehensive safeguards agreements that reflected the results of these efforts. At this point, the Board

established a committee, called Committee 24, to complete the task of drafting an additional protocol starting with the IAEA's draft. Committee 24 met from July 1996 until April 1997. The next month, the Board adopted the Committee's proposed text, the final version of which is published as INFCIRC/540 (Corrected), *The Model Protocol Additional to the Agreement(s) between State(s) and the International Atomic Energy Agency for the Application of Safeguards*.

The creation of the Model Protocol can be divided into two stages. The first begins with the discovery of Iraq's clandestine nuclear weapon program in 1991 and ends with the creation of Committee 24 in 1996. The second is the negotiation of the Model Protocol.

2. 1991-1996 – SETTING THE STAGE

Special Inspections and the Reporting of Design Information: Beginning in 1991, the IAEA quickly focused on two measures already within the legal authority of INFCIRC/153 – special inspections and reporting of design information – and completed these discussions in early 1992. On special inspections, the Board urged the IAEA to exercise all of the Agency rights and obligations fully; “reaffirmed the Agency's right to undertake special inspections, when necessary and appropriate,” and reaffirmed the Agency's legal rights to “obtain and have access to additional information and locations in accordance with the Agency's Statute and all comprehensive safeguards agreements.” However, the Board action omitted any explicit reference to using information collected by national means as the basis for special inspections even though this was part of the Director General's report. Several States noted this omission with concern afterwards. The Board also stated its anticipation “that these special inspections should only occur on rare occasions,” an anticipation that has been met but that some consider to be inconsistent with full exercise of the IAEA's rights.

On reporting of design information, the Board changed dramatically the interpretation of INFCIRC/153 that was being used at the time. Rather than a fixed time – measured in months – before nuclear material was introduced, the Board decided that states should now have to report information as soon as a decision to construct a facility was made. Further information would then be required in stages. The Board called on States with NPT safeguards agreements to modify the relevant subsidiary arrangements to reflect this decision, a process that was completed when Iran agreed to do so in 2003.

Reporting of Exports and Imports: Concurrently, the Director General submitted reports to the Board describing other safeguards strengthening measures. In one, the IAEA proposed to establish a reporting system going beyond INFCIRC/153. The initial proposalⁱⁱⁱ called for reporting of the import and export of all nuclear material,^{iv} reporting about the production and location of ore concentrates; and the extension of the IAEA's verification activities to such materials. With respect to sensitive equipment and non-nuclear material, it sought information about its export, import, and production, and it proposed a system of checks and verification.

Concerns were expressed by some Members of the Board about the burden on industry, costs, and the safeguards value of such reporting. Little of the original proposal survived the Board's scrutiny, and in 1993 the Board adopted a “universal” reporting scheme that represented a significant revision of the original proposal. Absent was any reference to production of nuclear material; verification or checks of exports of non-nuclear material and equipment; and any reference to their import. The surviving elements were import and export of nuclear material and exports of specified non-nuclear material and equipment.^v For the latter, it was agreed to use the

list in INFCIRC/254/ Rev.1/Part 1, which was the then current Nuclear Suppliers Group trigger list (although the Group was not referred to by name). No dual-use item was included in the reporting scheme.

SAGSI: In September 1992, the Director General called on SAGSI to re-examine how safeguards were being implemented. SAGSI's 1993 report on new measures and technologies for strengthening safeguards proved to be influential. For example, it recommended that the IAEA take advantage of the collection and evaluation of all sources of information and that it use environmental sampling. Both are in use today, and the Model Protocol includes the authority to conduct environmental sampling during complementary access. It provides for wide-area environmental sampling, but only after approval by the Board, which has not occurred.

Referring to the CWC, which had then recently been adopted, SAGSI recommended that the Agency draw on it to develop model arrangements for the investigation of suspicious sites, a proposal that has not been adopted. SAGSI also suggested a trade-off between an enhanced capability to detect undeclared activities and a reduction in routine inspection activities, a trade-off that has been implemented.

Programme 93+2: Using the SAGSI report as a springboard, the IAEA decided in late 1993 to establish a two-year programme to further assess the legal, financial, and political impacts of SAGSI's recommendations. This program, which became known as "Programme 93+2," was organized into two parts: measures within existing authority and measures that would need complementary authority. Its goal was to define measures that would enhance the Agency's ability to verify completeness of States' reporting and maintain the effectiveness of the comprehensive safeguards system in a cost-efficient manner. Member States were also concerned about the impact on industry.

In 1995, the Director General's progress report to the Board on strengthening safeguards focused on an Expanded Declaration; environmental monitoring; improved analysis of information, and increased physical access. The Expanded Declaration included a variety of historical information, for example, on decommissioned facilities, and a broad array of information, including on national nuclear fuel cycles, sites of facilities and activities in their vicinity, and some R&D and manufacturing activities. Much of what was proposed in this text is reflected in the Model Protocol.

Draft Model Protocol: By mid-1996, the programme had reached the point where the IAEA could send a draft Model Protocol (GOV/2863) to the Board of Governors. In response, the Board decided to establish an open-ended committee to complete the negotiation of a Model Protocol using the IAEA draft as the basis for its discussions. By mid-1996, much of what would become the content of the Model Additional Protocol was essentially agreed because while, in principle, all issues remained on the table, in practice, outcomes respected earlier decisions. Of significance in this regard were earlier decisions to:

- a) Use the 1993 NSG trigger list for reporting of exports; omit dual-use items; and omit any verification or checks (except cross-checks) of exports and imports;
- b) Specify the equipment and non-nuclear material whose manufacture, assembly, or maintenance was to be reported;
- c) Draw on the CWC for provisions on managed access; a simplified procedure for designation of inspectors; and the right of the IAEA to its own communications systems;

- d) Permit environmental sampling;
- e) Permit access to the sites of facilities; and
- f) Omit reporting of historical information.

3. 1996-1997: COMMITTEE 24 – NEGOTIATION OF THE MODEL PROTOCOL

All member states of the IAEA were eligible to participate in Committee 24. However, only about 80 states participated on a regular basis. The negotiating dynamic soon evolved into discussions between roughly four groups: (1) States with significant nuclear power programs and INFCIRC/153 agreements. These states often took positions intended to reduce costs and impact on industry. Examples are Germany, Japan, Belgium, Spain and Italy, who operated as a group under German leadership, and Argentina, Brazil, Canada, and the ROK, who operated largely on their own; (2) States lacking significant nuclear programs whose concerns were often to reduce both overall cost and the impact on programs of more interest to them such as technical cooperation; (3) NPT nuclear weapon states not required to have INFCIRC/153 agreements. Of the five, France, the UK, and the US were among the most active, often being supported by Australia; and (4) States with INFCIRC/66 agreements, Cuba, India, Israel, and Pakistan, whose participation was directed primarily at ensuring that the outcome would have no impact on them.

The negotiations were largely, but by no means exclusively, confined to groups 1 and 3. The Committee commenced its work by working its way through the IAEA draft. The first meeting was largely devoted to familiarizing everyone with the draft. Based on preliminary comments, the Secretariat undertook a second draft. This pattern prevailed throughout the negotiation. The IAEA would introduce each provision in turn, discussing what the provision was designed to accomplish and why it was drafted the way it was drafted. The floor would then be open for comments or questions by individual delegations.

The approach contained in the drafts before the Committee included two basic components—an expanded declaration and access to locations – that had evolved during the period from 1991-1996. The expanded declaration was designed to give the IAEA a basis for understanding the overall capability of a country to have a clandestine nuclear program and for identifying an inconsistency or lack of completeness that might indicate such a program. This had led to inclusion of such things as uranium mining, manufacture of specialized nuclear equipment, certain nuclear research and development, and certain non-nuclear material. The second basic component was the right of the Agency to have complementary access to locations should it have concerns about the correctness or completeness of a declaration or to identify inconsistencies in it. Complementary access turned out to be broader at locations where the Agency already had access, generally where nuclear material was present, and more limited elsewhere. For obtaining both additional information and access, the Committee had to consider new issues relating to States' legal and constitutional requirements, the need to protect sensitive information, and universality.

In general, the comments received in the early meetings demonstrated that for the most part the problems addressed were practical, not matters of principle. With respect to the declaration, for example, some research and development activities would be well known to the state or the information was easily obtainable while others were not. Greater access could be provided at heavily regulated nuclear facilities already under safeguards, but it could be more difficult to provide the Agency with access to a non-nuclear facility. Many thought that more notice was

required and greater protection of proprietary interests were needed at these non-nuclear facilities.

One basic issue was not just access but the purpose of access. For example, many states did not believe that the Agency should verify items in the expanded declaration to which complementary access was provided with the same stringency that was applied to verification of nuclear material. While everyone generally agreed with the difference, there was no easy agreement on precisely how practical differences should be accommodated.

There were also differing views among participants about the applicability of the Model Protocol. Was it to be universal or apply, for example, only to states with comprehensive safeguards agreements? What about states with INFCIRC/66 agreements? Or NWS? INFCIRC/66 states steadfastly opposed any coverage, while the NWS, in varying degrees signaled a willingness to accept measures on a voluntary basis. As with the negotiation of the NPT itself, some non-nuclear weapon states (NNWS) expressed concern that their elected officials might find it difficult to support adherence to the protocol if the NWS would appear to obtain a commercial advantage.

To mitigate these concerns, the U.S., for example, made statements in the Board that made clear that it would accept all the provisions of the Protocol, albeit with a national security exclusion, but there remained concerns about this commitment. It also made high-level assurances.

These actions, combined with a close working relationship that had been developed with the German delegation, allowed the two delegations to begin intensive efforts between sessions to address the myriad outstanding details. Once those discussions had concluded in late 1996, both Germany and the US worked with others in their respective camps to persuade them to accept the products of that work. With some exceptions, the success of that work was demonstrated at the next Committee meeting when most, but certainly not all, of the formulations were accepted by the Committee.

A key remaining hurdle was how to address the three categories of states within the IAEA safeguards systems: NPT NNWS, NWS, and the four states then not parties to the NPT (Cuba, India, Israel, and Pakistan). It was readily agreed that Protocols for NPT NNWS “shall contain all the measures” of the Model Protocol. Because they would have undeclared nuclear activities, the NWS suggested that the purpose of the Model Protocol and many of its provisions were inapplicable to them. It was finally agreed that Protocols with NPT NWS should contain the measures that each one “identified as capable of contributing to the non-proliferation and efficiency aims of the Protocol.” Protocols for other states were to contain measures they were prepared to accept in “pursuance of safeguards effectiveness and efficiency objectives.”

After Committee 24 concluded its work, the Model Protocol was submitted to the Board of Governors, and the text of the draft protocol on which the committee had agreed was approved by the Board of Governors in May 1997. The final version of the Model is published by the IAEA as INFCIRC/540 (Corrected), *Model Protocol Additional to the Agreement(s) between State(s) and the International Atomic Energy Agency for the Application of Safeguards*. It is fitting testimonial to the working procedures of the Committee that the Model Protocol was approved by the Board with no changes.

4. BASIC ISSUES IN THE MODEL PROTOCOL – HOW THEY WERE RESOLVED

4.1. Universality: As noted above, throughout the entire process, NNWS stressed the importance of universal application of the Model Protocol. This was important enough that the Committee would not have sent the final draft Model Protocol to the Board without an explicit accompanying statement that the NWS would be clear on their intentions to implement the Model Protocol before the Board took any action. In turn, the Board would probably not have approved the Model Protocol without the commitments made by the NWS to implement measures in the Model Protocol.

4.2. Purpose of the Additional Protocol: The IAEA's draft did not specify a basis for complementary access. Committee 24, though, addressed the basis for complementary access; its objective; and how to balance access vs. impact. As a result, the Model Protocol addresses access differently at different types of location. Access is permitted on a "selective basis" to places where nuclear material is located to "assure the absence of undeclared nuclear material and activities." Access to other locations is restricted to instances where there is a need to resolve a question or an inconsistency related to the correctness and completeness of the expanded declaration. The result is that the Agency has much broader access rights where there are declared nuclear activities -- activities that might mask undeclared nuclear activities.

The Model Protocol also limits the intensity and type of activities in other ways, for example, in Article 4, which states that, "The Agency shall not mechanistically or systematically seek to verify the information" in the expanded declaration. There was no explanation of the words "mechanistically" or "systematically," but the sentence does not seem to have restricted the Agency's use of complementary access.

4.3. Constitutional and Legal Limitations: Much of the information and access to be provided under the Model Protocol relate to places where there is relatively little regulation compared, for example, to the heavily regulated nuclear facilities covered by INFCIRC/153. Thus, its implementation raised legal issues such as privacy and search and seizure. In order to address constitutional issues, the Committee made several distinctions: (1) between governmental and private sector activities; and (2) between locations with nuclear material and elsewhere. For governmental activities, relevant information "shall" be reported, but for private activities, states are obligated to make "every reasonable effort." The "shall" means that there would be uniform reporting because states are required to adopt new laws to do so, instead of reporting only when consistent with a State's laws and constitution.

4.4. Environmental Sampling: For declared facilities, the IAEA had authority to use environmental sampling under INFCIRC/153. However, the Model Protocol raised new issues because of the proposed use of environmental sampling during complementary access. The two main issues for environmental sampling were its purpose and the conditions for using wide-area environmental sampling. For the former, some States proposed location-specific environmental sampling at any location without a stated purpose, with an alternative being only at locations declared not to have nuclear material and undeclared locations in the event of question or inconsistency arose. In the Model Protocol, location-specific environmental sampling is a permitted activity for all complementary access without an explicit rationale (although there must be a rationale for complementary access, itself).

In contrast, wide-area environmental sampling is incorporated into the Model Protocol at locations specified by the Agency, but it cannot be used until approval by the Board. This reflected its newness and uncertainty about its effectiveness and its costs

4.5. Agency Activities during Complementary Access and Notice of Complementary

Access: There was considerable debate about the criteria to be satisfied for the use of new technologies during complementary access, this being driven primarily by the expansion of the scope of Agency access foreseen under the Model Protocol. The IAEA draft had a straightforward solution by referencing INFCIRC/153, which specifies that the Agency may, “Use other objective methods which have been demonstrated to be technically feasible.” Other proposals were to require mutual agreement between the IAEA and the State or approval by the Board. “Mutual agreement” was opposed by many because of its potential to limit IAEA capabilities and at the same time result in non-uniform application. Some, including the U.S., opposed Board approval, because this had not been a typical procedure in the past. The outcome is that in almost all instances the use of new measures requires demonstration of technical feasibility, Board approval, and consultations between the Agency and the State.

Advance Notice of Complementary Access: The Secretariat’s first three drafts of the protocol provided for: no prior notice^{vi} to the State of complementary access if it were requested in the course of design information verification or inspections; and, for all other access, advance notice to the state at least 24 hours before the arrival of Agency inspectors at the location in question.

Other proposals called for a minimum of 24 hours notice in all instances and there was at least one proposal for 48 hours. The Committee strove to strike a balance between the practical difficulties that no-notice inspection or very short notice would pose for states vs. loss of confidence that the purpose of complementary access could be achieved if notice were too long. At the end of the day, the notice times in the Model Protocol satisfied the IAEA’s needs.

4.6. Managed Access: INFCIRC/153 permits a form of managed access, but a new provision was needed in the Model Protocol in view of the additional information and access that the Agency would be obtaining. The main issues addressed by the Committee were: when could managed access be used; and how to allow it and still permit the Agency to accomplish its objectives. On the first issue, the Committee received proposals based on: safety; proprietary or commercially sensitive information; physical protection; proliferation sensitive information; and “national security” reasons, “classified” information, and “confidential or restricted” information. It accepted all except the last group related to national security, which was considered to provide too much freedom to a State to designate anything as falling in one of these categories.

Regarding the qualifier on States’ use of managed access, the Committee chose a broad interpretation that managed access could not preclude the Agency “from conducting activities necessary to determine the absence of undeclared nuclear material and activities or otherwise resolve any inconsistency.” It rejected a more limiting qualifier that referred only to precluding the Agency from conducting activities necessary to resolve any inconsistency.

4.7. Protection of Safeguards Information: States were more concerned about the IAEA protecting information under the Model Protocol than under INFCIRC/153 because the amount and type of information provided under the Model Protocol would increase significantly. The CWC provided a model because it had an annex devoted to confidentiality, spelling out general principles and specific measures and procedures. The outcome was language in the Model

Protocol that calls for the Agency to have a stringent regime for the protection of confidentiality and that includes general principles and approval and periodic review by the Board.

4.8. Manufacture and Exports and Imports of Specified Equipment and Non-Nuclear Material: The main issues on reporting the manufacture and export and import of specified equipment and non-nuclear material arose because they involved private sector activities not generally under governmental nuclear regulations. These included for example, production, assembly, or maintenance of certain equipment or non-nuclear material and which transfers to report and what would be reported (export license approval, actual export, actual import, or confirmation of receipt of an import upon Agency request).

The outcomes were similar to those made on the universal reporting scheme in 1993. For the reporting of transfers, the NSG trigger list would be used as had been done for the voluntary reporting scheme (slightly updated); and use of items from the NSG dual-use list was rejected.

By and large the Committee adopted the Secretariat's lists for reporting the manufacture of non-nuclear material and equipment, adding three items, proposed by the U.S., criticality safe tanks and vessels; irradiated fuel element chopping machines; and construction of hot cells. However, the Committee deleted the dual-use items – beryllium, boron-10, enriched lithium, and tritium.

Other changes were motivated by states' desires to reduce impact and costs and to protect commercial or proliferation sensitive information. Two examples are: reporting only a "description of the scale of operations" on manufacturing activities; no verification or checks on exports or imports, and reporting only information about each export and, upon specific request, confirmation from the importing state.

CONCLUSION: Where an additional protocol is in force, the ability of the IAEA to detect undeclared nuclear material or activities is strengthened. It is strongest at facilities and their sites, where the IAEA has access to all places on the site and to all the buildings there. The IAEA now receives a wealth of information about states' nuclear fuel cycles, and it can obtain access in a state whenever it has a question or detects an inconsistency in the information provided to the IAEA. Where it is able to implement an Additional Protocol, the IAEA is now able to make State level evaluations on a firmer basis, and it draws conclusions about the absence of undeclared nuclear material and activities.

A number of factors permitted Committee 24 to succeed:

- U.S. leadership and support from the highest level of the USG;
- Consistent engagement by the DG and strong technical support from the IAEA;
- Willingness on the part of NNWS with significant nuclear programs to accept substantial increases in the information and access to be provided to the IAEA;
- The commitments of the NPT nuclear-weapon states to accept Protocol measures;
- External factors such as: shared concerns about proliferation in Iraq and the DPRK; Iraq's inability to influence IAEA deliberations; and a positive nonproliferation trend.

Finding common ground was possible only by taking steps to reduce impact and to reduce costs. This is clearly seen, for example, in outcomes related to reporting of manufacturing activities or exports and imports.

No one expects that a country that is cheating will provide the IAEA with the proof of its misconduct. However, the Protocol provides new opportunities for the IAEA to ask questions.

The Board, in turn, has the right to draw conclusions from a State's inability or willingness to resolve the IAEA's questions. The success of the Protocol in truly strengthening safeguards will, therefore, as in all cases, continue to require a resolute IAEA and a Board willing to act.

ⁱ (GC(XXXV)/OR.333¶56-58: Blix also stated that the IAEA needed enhanced access to the UN Security Council, which he suggested would help to deter states from violating their safeguards agreements.

ⁱⁱ Testimony before U.S. Senate Foreign Relations Committee. 10/23/1991. See <http://www.fas.org/news/un/iraq/iaea/dgsp1991n06.html> (May 21, 2010).

ⁱⁱⁱ See GOV/2568 20 January 1992.

^{iv} Note that INFCIRC/153 agreements do not require reporting about nuclear material if it has not reached the starting point of safeguards and is exported or imported specifically for non-nuclear purposes; neither are reports required of States without safeguards agreements with the Agency or a unilateral undertaking to make such reports.

^v Some states agreed to report the information omitted from the universal reporting scheme on a voluntary basis.

^{vi} The IAEA clarified its initial proposal for no notice at sites to mean short notice.