

## **Ensuring Effective Safeguards Coverage of States with Small Quantities Protocols**

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The majority of non-nuclear-weapon states (NNWS) party to the NPT do not have significant inventories of nuclear material and have no nuclear material in a “facility” as defined in the model comprehensive safeguards agreement. In order to simplify the application of safeguards for such states, in 1974 the IAEA introduced the Small Quantities Protocol (SQP). The SQP holds in abeyance certain reporting requirements and safeguards inspections, on the understanding that the SQP will lapse if the state undertakes significant nuclear activities.

As part of the program to strengthen the IAEA’s safeguards system, limits on the IAEA’s access to an SQP state were identified as a possible safeguards vulnerability – the IAEA could not readily confirm whether the state’s SQP status remained current. As a consequence, in 2006 the IAEA Board of Governors introduced a revised SQP.

This paper discusses a number of safeguards issues related to SQPs:

- whether the revised SQP provides an effective basis for applying safeguards. In this regard the IAEA Board has reiterated its call for all states, including those with SQPs, to conclude an Additional Protocol (AP);
- many SQP states are small with limited governmental resources and no capacity to develop the types of reporting that are required under the revised SQP and the AP. Can reporting requirements be simplified with the aim of ensuring that the IAEA’s safeguards goals are met without placing an excessive burden on the limited resources of small states?
- in addition to analysing state reporting, what other measures might be employed by the IAEA to ensure effective safeguards coverage of SQP states?

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### INTRODUCTION

The Treaty on the Non-Proliferation of Nuclear Weapons (NPT) is the pre-eminent international arms control agreement. As of May 2007 there were 190 State Parties to the NPT. There are only three states that have never been party to the NPT, (India, Israel and Pakistan), while the Democratic People’s Republic of Korea (DPRK) claimed to have withdrawn from the NPT in 2003.

Under Article III of the NPT all non-nuclear-weapon-states (NNWS) are obliged to enter into a safeguards agreement with the IAEA “...for the exclusive purpose of verification of the fulfilment of its 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 April 1971, the IAEA Board of Governors (BOG) approved a model safeguards agreement – this model is used by the IAEA as the basis for negotiating comprehensive safeguards agreements (CSAs) between the Agency and non-nuclear-weapon-states (NNWS) party to the NPT. The model CSA is contained in IAEA Information Circular 153 corrected (usually referred to as INFCIRC/153).

There are 72 states that are considered by the IAEA to have significant nuclear activities. This group consists of the five recognised NPT nuclear-weapon states (NWS), the three non-NPT States and 64

NNWS. The five NWS each have a special form of safeguards agreement which is referred to as a Voluntary Offer Agreement (VOA). The three non-NPT states have old safeguards agreements based on a model safeguards agreement that was agreed in the early 1960s (INFCIRC/66 Rev.2) which provides for facility-specific safeguards. The 64 NNWS have CSAs based on INFCIRC/153 covering all nuclear material in peaceful uses in each state.

While it may seem surprising, the majority of NNWS party to the NPT do not have significant inventories of nuclear material. As noted above, there are only 72 states that are listed by the IAEA as having significant nuclear activities and this number includes the three non-NPT states, meaning that only 69 NPT states have significant nuclear activities. This leaves 121 State Parties to the NPT which are believed to have no, or no significant, nuclear activities.

### SMALL QUANTITIES

In 1974 the IAEA BOG agreed to a BOG information document entitled “The Standard Text of Safeguards Agreements in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons” – GOV/INF/276. This listed the changes that could be made to the standard text of INFCIRC/153 type safeguards agreements. One substantive variation allowed by GOV/INF/276 related to states that had notified the Agency that they did not have significant nuclear activities. This variation took the form of a protocol, generally referred to as a “small quantities protocol” (SQP) which could be incorporated into CSAs. An SQP, as long as it remains operative, has the effect of holding in abeyance the implementation of most of the safeguards measures provided for in Part II of INFCIRC/153 and also shields the states concerned from having to allow safeguards inspections by the IAEA.

There are seven states<sup>1</sup> which originally concluded SQPs but which now have significant nuclear activities and so their SQPs are no longer operative. These seven states are subject to the full range of IAEA safeguards activities and reporting obligations under their CSA. Of this group, six states have small research reactors, while the seventh, Lithuania, has a large nuclear power plant complex built before the dissolution of the Soviet Union.

As of May 2007 there were 82 NNWS with operative SQPs.

### STRENGTHENING SAFEGUARDS

The major rationale for introducing SQPs was to reduce the load of safeguards implementation in states with only limited holdings of nuclear material and no nuclear facilities, saving IAEA resources for states with a higher priority for safeguards inspection and also reducing the safeguards burden for these states.

The discovery of Iraq’s clandestine nuclear weapons program after the first Gulf War was a key turning point for the safeguards system. Traditional safeguards measures were a very effective means of addressing declared inventories but they did not directly address the question of whether these declarations were complete, i.e. whether there were undeclared materials or activities in the state. It was assumed that development of fuel cycle capabilities independent of declared facilities would be beyond the resources of most states, and in any event would be readily detectable, and therefore if proliferation did occur it was likely to involve diversion of nuclear material from declared facilities.

In the period leading up to the 1995 NPT Review and Extension Conference a major program was undertaken by the IAEA and the various Member State safeguards support programs to address the weaknesses in the safeguards system highlighted by, inter alia, the situation in Iraq. The IAEA

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1. Ghana, Jamaica, Lithuania, Malaysia, Morocco, Nigeria and the Syrian Arab Republic

identified a comprehensive set of strengthening and efficiency measures divided into two parts: Part 1, consisting of measures which could, in the Secretariat's view, be implemented under existing legal authority, and which were initiated following notification to the Board in June of 1995; and Part 2, consisting of measures which were believed to require complementary legal authority (which takes the form of an additional protocol to the state's CSA – based on the model additional protocol, INFCIRC/540).

The new measures in the additional protocol are of three general types: information related, access related, and those related to administrative arrangements. The first category includes requirements for the state to provide declarations about all aspects of its nuclear fuel cycle and nuclear fuel cycle research and development, as well as any other location where nuclear material intended for non-nuclear use is present, about buildings on the state's nuclear sites, and about the manufacture and export of sensitive nuclear-related technologies. The access provisions provide expanded Agency access to locations declared by the state, and access for environmental sampling at locations not declared by the state. The administrative arrangements include simplified inspector designation, multiple entry long-term visas, and Agency access to modern means of communication (e.g. satellite communications systems).

#### HOW IS THIS RELEVANT TO SQP STATES?

The natural question to ask at this point is how is this relevant to SQP states? As they have no significant nuclear materials and no facilities, why would the IAEA be interested in them?

The answer is simple - expectations about the IAEA and safeguards have changed. Before the advent of the additional protocol IAEA safeguards resources were focussed on the verification of declared inventories at declared facilities. SQP states with neither facilities nor nuclear materials were simply not a matter of concern. Under the strengthened safeguards system the IAEA is expected to be able to draw broader conclusions as to the absence of undeclared nuclear materials, facilities and activities in states.

It is no longer sufficient for the IAEA to simply accept that an SQP state has no safeguards relevant materials, equipment or technology on the basis that it said that was the case some time in the past (in many cases in the 1970s). The IAEA has to draw on the resources that it has available to determine whether that is still the case – to determine that the state's declaration as to its eligibility for an SQP is:

1. current (while it may have been true in 1972, is it still true);
2. accurate (that the state's nuclear material holdings are within the SQP limits and that the state has no nuclear facility);
3. complete (no undeclared safeguards relevant facilities, materials, equipment or technology).

In order to draw the conclusions that states' declarations are complete and accurate for the states with CSAs, the Agency needs, *inter alia*, the authority:

- (a) to require regular reports on nuclear material holdings;
- (b) to require the early submission of facility design information;
- (c) to determine the status of any nuclear facilities; and
- (d) to be able to perform verification activities in the field.

However, as noted above, an SQP holds the IAEA's authority to take these steps in abeyance. As a result, the IAEA safeguards conclusions for an SQP state, in the absence of an additional protocol, are

made primarily on the basis of the analysis of information from sources other than the state itself and the IAEA does not have any chance to perform on-site verification as appropriate.

This is clearly inconsistent with the strengthening of safeguards, where an essential element is to enhance the Agency's capabilities to verify states' declarations. Notwithstanding the original SQP's formal suspension of most safeguards procedures, in the opinion of the authors the Agency retains the right to confirm the validity of any claim to "small quantity", which would lapse if prescribed limits on nuclear material are exceeded. Further, if information analysis should indicate to the Agency that quantities may have been exceeded in a particular state, or the state has acquired a facility, the Agency must have the right to seek clarification including, if necessary, the right to conduct a special inspection, albeit not routinely.

Of course the vast majority of NNWS Parties to the NPT will have no intention of avoiding or evading their safeguards obligations - this is especially true for the SQP states which often have small economies, limited scales of development and higher priority claims on their limited available resources. But it is also true that most states would prefer not to have the IAEA drawing its safeguards information from third-parties with no opportunity to provide balance or correct any potential inaccuracies in the information. An appropriate balance has to be struck between the reasonable concerns of SQP states to avoid undue and unnecessary effort, on the one hand, and the interests of the international community in ensuring that the IAEA is able to provide an effective safeguards system with soundly based safeguards conclusions, on the other.

#### THE ROLE OF THE ADDITIONAL PROTOCOL

While the Agency's authority to verify both the correctness and completeness of a state's declarations under a CSA derives from the agreement itself, the tools available to the IAEA to do so under a CSA are limited, especially for SQP states. The AP provides a comprehensive toolkit of additional measures which address some of the noted limitations on CSAs by providing for broader access to information and locations. The AP significantly increases the Agency's ability to verify both the correctness and completeness of a state's declarations under a CSA. The AP is necessary in order for the IAEA to draw its broader safeguards conclusions.

The entry into force of an AP for an SQP state is an important means of addressing some of the difficulties that the IAEA faces in attempting to draw safeguards conclusions for that state. However, APs do not address the IAEA's need to receive facility design information at an early stage from an SQP state that has, or is planning to acquire, a facility. Nor does it address the need for a state to provide the Agency with an initial report on its holdings of nuclear materials. Importantly, APs do not provide for the right of the Agency to verify, if needed, that a state qualifies, or continues to qualify, for an SQP.

So for the IAEA to be able to draw its broader safeguards conclusions for SQP States, the AP can be described as being necessary but not sufficient.

#### REVISING THE SQP

The IAEA Secretariat raised the issue of the adequacy of safeguards conclusions for SQP states in the 2003 Safeguards Implementation Report (SIR) and then again in the February 2005 BOG meeting. The IAEA emphasised that it was not at that time aware of any credible information to suggest there were activities in an SQP state that would be of proliferation concern but that it considered it necessary, as part of the efforts to strengthen the safeguards system, to ensure that it had the right to apply appropriate verification measures in all states.

In May 2005 the IAEA proposed a revised form of SQP that could be used to replace the 1974 version of the text from GOV/INF/276. This revised SQP text is contained in GOV/INF/276.mod 1. The revised SQP provides for states to make annual declarations of their holdings of nuclear materials, in effect requiring them to actively declare that they still qualify for their SQP. The revised text also makes it clear that the SQP ceases to apply as soon as the state makes the decision to build a nuclear facility (well before it receives any nuclear material).

#### REPORTING TO THE IAEA

For states with a revised SQP but without an AP there will be a requirement to report annually on holdings of nuclear materials to the IAEA. In the case of many of the SQP states these reports will be relatively simple. They do not have nuclear material and they have no intention of acquiring nuclear material for nuclear use. Following an initial declaration, it may be sufficient for the report to take the form of a letter that simply says there has been no change in the state's nuclear material holding or nuclear activity in the previous year.

[For states with an original form SQP and an AP some odd reporting anomalies can arise in which the state is obliged to provide the IAEA with more information on uranium mining activities than for small holdings of more significant nuclear materials such as high enriched uranium (HEU).]

For states with a revised SQP and an AP there will be a range of additional items of information that will have to be supplied to the IAEA in accordance with the IAEA's document "Guidelines and format for preparation and submission of declarations pursuant to Article 2 of the Additional Protocol for States with a Small Quantities Protocol". It should be possible for the SQP state to make its annual declaration on holdings of nuclear material when it makes its protocol declaration. It would be beneficial to these states if standard simplified reporting requirements were developed for the different grouping of SQP states. This would ease concerns over the burden of reporting to the IAEA. For the very smallest of SQP states, these may need to be designed for non-technical officials with no nuclear knowledge.

It will be necessary for the IAEA to work with the states concerned and with supportive regional partners to seek to limit the reporting burden on SQP states with limited involvement in nuclear activities and a limited level of government involvement in international affairs. In addition, it is likely that many states will be unaware of the existence, exact location, quantity and/or type of all the nuclear material on their territory. The process of finding and cataloguing this material may well be more difficult and time consuming than that required for actual reporting to the IAEA. Assistance from the IAEA and others will be essential if this is to be done effectively and in a timely manner.

#### IAEA INSPECTIONS

The second important change in the revised SQP is the removal on restriction on IAEA inspections. Many SQP states have not had to put in place mechanisms to facilitate inspections, and will be unaware of their responsibilities. Such states will need detailed guidance on the how to handle inspections, including issues such as the legal authority to enter private property, identification of property owners, timely provision of access and provision of information and records.

#### WIDER IMPLICATIONS

The effects of modifying the SQP go beyond the enhanced operation of the safeguards system. The new measures require all states (large and small) to account for any nuclear materials and activities. The modified SQP requires states to improve national controls on such materials and activities and

thus has a role in preventing clandestine nuclear activities by non-state actors. This is in line with the objectives of United Nations Security Council Resolutions 1540 (2004) and 1673 (2006).

The conclusion of additional protocols - which require all states, including SQP states, to report on transfers of specified equipment and non-nuclear material - makes a real contribution to the broader non-proliferation aims of UNSC1540 and 1673 through limiting the avenues for illicit trafficking in technologies of concern.

#### IS THE REVISED SQP GOOD ENOUGH?

On balance it appears that the revised SQP has given the IAEA the authority that it needs to draw its safeguards conclusions. The state is required to submit facility design information as soon as it makes the decision to build a facility and the IAEA has the right to check on the status of facilities and perform on-site verification. For states adopting the revised SQP, the IAEA will no longer be wholly dependent upon third party information to draw its safeguards conclusions about an SQP state.

But there are SQP related problems that will continue for quite some time. The SQP is an integral part of the state's CSA. The CSA is a bilateral, treaty-level agreement between the state and the IAEA. The IAEA is not able to unilaterally change any part of the CSA - such as the SQP - any changes have to go through the legal and constitutional processes necessary for the amendment of the CSA. So the process of moving from old form SQPs to revised SQPs is likely to take a considerable period of time. As of May 2007 only around 10% of the SQP states have taken up the new form SQPs. The IAEA will be operating with both forms of SQP, probably for many decades.

In the authors' opinion it would have been preferable for the IAEA and the Member States to work together over a longer period of time to develop a better model for a revised SQP and to seek an amendment solution that did not involve each and every SQP state having to individually adopt the new measures. Unfortunately working through international organisations is a process that involves balancing of competing national positions and priorities. The IAEA and its Member States reached the judgment that the current revision was the best they could hope to achieve in the circumstances.

#### WHY IS THE PROCESS SO SLOW?

The states that qualify for an SQP are quite varied in size (geographically, economically and politically). It is instructive to look at the types of countries which have SQPs; it is a very mixed group. Some SQP states are like Singapore and New Zealand with comparatively small populations and land areas that are also comparatively rich with well-developed technical infra-structures and civil societies. Some SQP states are like Kenya and Madagascar which are large and populous with limited levels of civil, technical and economic development. Others are like Andorra and Kiribati with extremely small populations, limited governments and limited involvement in international affairs.

While the wealthy and economically developed SQP states are likely to move to adopt the new measures with reasonable alacrity, many of the smaller and less developed states can be difficult to engage on such issues.

#### STATES WITHOUT AGREEMENTS

Astute observers will note that five (the NWS) plus 64 (the NNWS with significant nuclear activities) plus 82 (the NNWS with SQPs) falls significantly short of the total of 190 States Parties to the NPT. This is because some 31 states have signed the NPT but have not yet completed their required safeguards agreement with the IAEA. Fortunately none of the "tardy" states are believed to have significant nuclear activities and accordingly all of them should qualify for an SQP to their safeguards

agreement, but: there are nine NNWS with which such agreements have been signed but are not yet in force; there are two NNWS for which such agreements have been approved by the BOG but have not yet been signed; and, most worrying of all, there are 20 NNWS that have not yet submitted comprehensive safeguards agreements to the BOG for its consideration.

The fact that 31 states have not yet completed their required CSA (with or without an SQP) is a matter of considerable concern to strong supporters of the NPT (such as Australia). Australia has worked cooperatively with IAEA and likeminded friends of the NPT such as Japan to seek to actively address this issue in our region. In 2006 Australia hosted a workshop entitled “Multilateral Verification of Nuclear Non-Proliferation Undertakings: Safeguards Agreements, Small Quantities Protocols and Additional Protocols” which was aimed at the small countries in our region many of which had not completed their required CSA. The workshop encouraged those states to bring into force CSAs, additional protocols and revised SQPs. It was clear from the workshop that many held the view that non-proliferation and nuclear safeguards were not high national priorities and that they wished to minimise the legislative, regulatory, reporting and inspection burden associated with their safeguards obligations.

## OTHER MEASURES

As part of the strengthened safeguards system, the IAEA has developed a capability to collect and analyse a wide range of information. Some of this information is reported or declared by the Member States themselves, but much is provided by third parties or gathered by the IAEA from open sources, such as the media, academic literature and internet search engines. The effort to rank, authenticate, collate and analyse is becoming an increasingly important part of the IAEA’s efforts to derive credible safeguards conclusions.

The existence of the IAEA’s information collection efforts give rise to the possibility that attempts to divert material or misuse nuclear facilities could be uncovered by the IAEA. The risk of detection is a significant element of deterrence. While such efforts to collect information can never be 100% perfect the effort must be credible and it must also be perceived as credible by the international community.

The IAEA has recently moved beyond the analysis of information related to specific states viewed in isolation to developing a holistic analysis of the networks of international trade in nuclear materials, equipment and technology. Network analysis will develop an additional dimension to the IAEA’s efforts to detect possible involvement by SQP states (willingly or unknowingly) in undeclared acquisition of nuclear material or use of undeclared nuclear facilities.

## CONCLUSIONS

The IAEA needs the full range of measures available under a CSA and an AP to draw the broader form of its conclusions as to both the completeness and correctness of a state’s declarations on its holdings of nuclear material and its nuclear activities. As the traditional SQP removes some of these important measures from the IAEA toolkit, it represents a potential weakness in the safeguards system that has to be addressed.

The revised form of the SQP is a necessary, albeit imperfect, attempt to address this potential weakness.

Many of the SQP states have underdeveloped economies and civil societies and will be difficult to engage on this issue. In view of the low priority given to safeguards by many SQP states, it will be challenging to simply make them aware of the importance of this issue. Australia will continue to work

with likeminded regional and international partners to ensure that all SQP states are aware of their obligations and their role in ensuring an effective and efficient safeguards system.