

# A REFLECTION ON THE CURRENT STATE OF NUCLEAR NON-PROLIFERATION AND SAFEGUARDS

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## I. INTRODUCTION

Given the consequences of the use of nuclear weapons, nuclear non-proliferation is one of the greatest security challenges facing the international community today. There are currently nine states in possession of nuclear weapons or nuclear explosive devices around the world—five of which are recognised as ‘nuclear weapon states’ by the 1968 Non-Proliferation Treaty (NPT)—and several others that might fall into the category of having a ‘latent’ weapons capability or ‘hedge’ option.

Remarkably, however, the world of several dozen nuclear-armed states that US President John F. Kennedy and others predicted in the early 1960s has not materialized. Although other factors—such as United States’ security guarantees to other states, and the technical challenges associated with manufacturing nuclear weapons—have played their own parts in slowing proliferation, the role of the NPT, in terms of both its normative force and the verification procedures it establishes, has been critical.

For some time, however, the treaty has been under severe strain—not least due to the perennial tension between its nuclear weapon and non-nuclear weapon states parties over the process of disarmament. Under the NPT, the latter (i.e. all except the five pre-NPT weapon states of China, France, Russia, the United Kingdom and the USA) undertake not to build or otherwise acquire nuclear weapons, while the former agree to pursue negotiations on nuclear disarmament. Such is the grand ‘bargain’ around which the treaty revolves. Warhead numbers have fallen significantly since their cold war peak in the mid-1980s, and look set to continue to drop, but many non-nuclear weapon states argue that this is not going far or fast enough. The nuclear weapon states, they say, are not living up to their side of the deal—and that has potentially significant impacts for non-proliferation efforts.

## SUMMARY

Although its demise is often foretold, the nuclear non-proliferation regime remains an essential part of the overall international security architecture. It is important that it remains so given the projected rise in the number of countries investing in nuclear power programmes. With this possible increase of states with nuclear power, and the associated extra facilities that would need to be safeguarded, the need for a robust and efficient International Atomic Energy Agency (IAEA) safeguards system is becoming an increasing imperative.

This paper first looks at the main prohibitions of the 1968 Non-Proliferation Treaty, then examines the history and operation of the IAEA safeguards system. It concludes with some suggestions for improvements. It makes the case for increasing the IAEA safeguards budget, highlights the importance of legislative and technical assistance, and stresses the need for the continued optimization of the safeguards system.

## ABOUT THE AUTHOR

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There are also a number of specific proliferation crises that are now familiar causes of concern, in the Democratic People's Republic of Korea (DPRK, or North Korea) and Iran especially. North Korea withdrew from the NPT in 2003 and subsequently tested two nuclear explosive devices (in 2006 and 2009). The recent death of the North Korean leader Kim Jong-il—who oscillated between policies of hostility and engagement with the West during his time in power—makes the present juncture a very uncertain one for North Korea. Tension in the region is currently high, as regional states monitor the transition of power to the untested 28-year-old Kim Jong-un closely.

Iran, for its part, represents an insider challenge to the treaty: a non-nuclear weapon state NPT member that many Western powers suggest is pursuing a clandestine nuclear weapon development programme. The International Atomic Energy Agency (IAEA) has for many years repeatedly asked Iran to clarify inconsistencies regarding its nuclear activities. The IAEA's most recent safeguards report on Iran, released on 18 November 2011, was the most critical of Iran to date. In the report, the Agency noted its 'serious concerns regarding possible military dimensions to Iran's nuclear programme', concerns based on 'extensive information' that, it said, it found 'to be, overall, credible'.<sup>1</sup>

Some would, and do, argue that the NPT bargain is unsustainable over the long term, and that the cracks in the non-proliferation regime are beginning to widen. But notwithstanding the above-mentioned crises, the NPT has shown itself to be a remarkably robust pact over the years. Today, the NPT has near universal membership and the norm against the possession of nuclear weapons is exceptionally strong. Why that is, and how that norm has been maintained, is explored in the next section of this paper.

## II. NON-PROLIFERATION

The NPT is the cornerstone of the nuclear non-proliferation regime. Without it, governments would be without limits in considering their nuclear choices. The treaty has its flaws, some of which are discussed below, but it nevertheless remains a central barrier to nuclear weapon acquisition. Why this is the case is

<sup>1</sup> IAEA, Board of Governors, 'Implementation of the NPT Safeguards Agreement and relevant provisions of Security Council resolutions in the Islamic Republic of Iran', GOV/2011/65, 8 Nov. 2011

open to debate. It is not the central aim of this paper to introduce arguments for or against the effectiveness of the treaty. Nevertheless, it may be useful to begin this paper by summing up the main arguments.

Scholars have attempted to define why sovereign states adhere to treaties since ancient times. A large majority of them focus on the age-old principle that agreements must be kept.<sup>2</sup> In international law, this principle is written into the 1969 Vienna Convention on the Law of Treaties as 'every treaty in force is binding upon the parties to it and must be performed by them in good faith'.<sup>3</sup> Unless the treaty itself condones non-performance or withdrawal, the only way a state can evade its obligations is by arguing that treaty implementation would violate a peremptory norm of international law or that there has been an unforeseen and fundamental change of circumstances that makes implementation impossible.<sup>4</sup>

Some would argue that the NPT puts in place a normative barrier, a psychological threshold of sorts, to acquisition of nuclear weapons. Those who subscribe to this view often rely on the inherent value of international law. More than three decades ago, Louis Henkin observed that 'almost all nations observe almost all principles of international law and almost all of their obligations almost all of the time'.<sup>5</sup> The same could be said of adherence to the NPT. Since its entry into force, almost all of its participants have observed almost all of their rules almost all of the time. States join the NPT, these people would argue, as subscription to the norm is important in order to be in good standing in the international community.<sup>6</sup> Hence, since states joined the treaty in good faith, they continue to implement it in good faith. This is undeniably a logical conclusion as it would be far-fetched in most cases to join a treaty with the intention of breaking it.

In a remarkable piece of analysis, Harald Müller and Andreas Schmidt—two noted German academics—argue that the international non-proliferation norm itself is the strongest barrier to proliferation. Using quantitative analysis, they find that the majority of

<sup>2</sup> In Latin, the principle is known as *pacta sunt servanda*. It is a basic principle in all known civil legal orders.

<sup>3</sup> Vienna Convention on the Law of Treaties, done in Vienna 23 May 1969, entered into force 27 Jan. 1980, *United Nations Treaty Series*, vol. 1155, p. 331.

<sup>4</sup> Vienna Convention on the Law of Treaties (note 3), Article 62.

<sup>5</sup> Henkin, L., *How Nations Behave: Law and Foreign Policy*, 2nd edn (Columbia University Press: New York, 1979).

<sup>6</sup> See Rublee, M., *Nonproliferation Norms: Why States Choose Nuclear Restraint* (Georgia University Press: Athens, 2009).

nuclear weapon acquisition efforts started before conclusion of the NPT. After the entry into force of the treaty, many of these efforts stopped. In addition, only a handful of new efforts emerged, the vast majority of which were conducted in states not yet signed up to the norm. The authors argue, in particular, that the NPT had an important impact on the behaviour of states that gained independence after 1960.<sup>7</sup>

However, circumstances may change. It would be somewhat naive to assume that states' normative reasons for joining a treaty would be carved in stone. Rather, the support for a treaty ebbs and flows over time. The NPT is not exempt from this. While the reasons for joining the NPT might have been clear for a government 30 years ago, the same rationale may seem less convincing to today's decision makers. Their political calculus may have been altered by new threat perceptions, such as a declining relationship with a powerful state, or perhaps even by regional strife and conflict.

It is here that the treaty's control system starts to become significant. Some would argue that it is the control system that puts a practical hurdle in the way of weapon acquisition. They would say that the risk of early detection of a weaponization effort looms large in the security calculus of any state considering the nuclear option. While this may be true, it does not help to explain why states join the treaty in the first place. After all, the state places itself under international control voluntarily.

It remains clear, however, that once a state places itself under international supervision it tends to take it quite seriously. Israel, for instance, went to great length in concealing its activities from US inspectors. Sweden, in developing its nuclear weapon plans, found it problematic that the heavy water in one of their reactors was under US supervision. Iraq, for its part, put an elaborate deception scheme in place during the 1980s. North Korea, of course, tried to produce a perfect baseline declaration for the IAEA when it was reluctantly dragged into the NPT safeguards system in the early 1990s.<sup>8</sup> It would seem reasonable to conclude that the IAEA safeguards system is having a significant deterrent effect, on the basis that states have put

considerable effort into trying to conceal proliferative activities from inspectors.

Others, mostly realists, argue that it is a combination of security arrangements given by the recognized nuclear weapon states, combined with the overhanging threat of use of force that gives the non-proliferation regime some stability. They would say that the non-proliferation regime would not have been successful in Europe, for instance, had the USA, and to some degree the Soviet Union, failed to put their client states under their respective nuclear umbrellas.

In reality, it is probably a combination of all these factors that have contributed to the success of the NPT. That the treaty has been successful ought to be beyond discussion. There have been only a few known instances of non-compliance. In four cases, weapons have been acquired by states standing outside the regime. There have been three cases of development of weapons capabilities from within the regime (one of which was successful), and there are two present cases of suspected non-compliance. That, on balance, is a good track record for a security-oriented treaty.

### **The main objectives of the treaty**

The NPT's essential non-proliferation obligations are contained in its first three articles. In the first article, it requires those states that possess nuclear weapons not to transfer control of these to any other government. The same states also pledge not to assist, encourage or induce any non-nuclear weapon state to manufacture or otherwise acquire nuclear weapons.<sup>9</sup> In other words, the first (and arguably most central) obligation under the treaty places an obligation on the nuclear weapon states not to proliferate weapons-usable information or material, or the devices themselves, to non-nuclear weapon states.

It is well known that the second article of the NPT places a similar obligation on all other parties to the treaty. They are not to be given control over nuclear weaponry, and they pledge not to manufacture or otherwise acquire these weapons. In addition, they

<sup>7</sup> Müller, H. and Schmidt, A., 'The little known story of de-proliferation: why states give up nuclear weapon activities', eds W. Potter and G. Mukhatzhanova, *Forecasting Nuclear Proliferation in the 21st Century. The Role of Theory*, vol. 1 (Stanford University Press: Stanford, 2010), pp. 124–58.

<sup>8</sup> Personal communication with senior IAEA inspector, Sep. 2009.

<sup>9</sup> Josef Goldblat, however, notes that 'in the process of ratification of the NPT by the US Congress, the US Government made a declaration of interpretation, according to which the Treaty would cease to be valid in time of war. In other words, from the start of hostilities, transfer of nuclear weapons or of control over them, as well as their acquisition by non-nuclear weapon states by other means, would cease to be prohibited'. Goldblat, J., *Arms Control: The New Guide to Negotiations and Agreements*, 2 edn (Sage: Wiltshire, 2003), p. 102. This declaration has not been without controversy.

are obliged not to seek or receive any assistance in the manufacture of nuclear weapons or nuclear explosive devices.

### **A regime not without its flaws**

While the NPT is seemingly loophole-free, it actually contains a number of weaknesses. Two are worthy of being mentioned in more detail. First, the treaty fails to define what a nuclear weapon actually is. On the one hand, the fact that the main object of prohibition is undefined may sometimes cause problems for compliance determination (and one of those problems, relating to the meaning of the word ‘manufacture’ is discussed below). On the other hand, it can be successfully argued that a detailed definition here could have resulted in failure to agree on a treaty in the first place.

While not necessarily a weakness, the definition of a nuclear weapon state has also caused confusion. In 1974 India crossed the nuclear threshold and tested a nuclear explosive device. It claimed that the explosion was conducted in furtherance of peaceful objectives. Many other countries disagreed with that characterization, however. It is widely assumed that neighbouring Pakistan’s quest for nuclear weapons was invigorated and given overriding priority after India’s nuclear capacity had been demonstrated. In light of Article IX.3 of the NPT, which defines a nuclear weapon state as one which had manufactured and exploded a nuclear explosive device before 1 January 1967, India was never recognized as a nuclear weapon state under the NPT, giving rise to the phenomenon of states that possess nuclear weapons not being legally recognized as nuclear weapon states. Today, there are nearly as many de facto nuclear weapon states as there are legally recognized ones. How to deal with these states within the broader non-proliferation regime remains a largely open question.

Neither was it, to quote Jozef Goldblat, ‘clear what is meant by the NPT ban on the “manufacture” of nuclear weapons’. Goldblat continues

the unchallenged US interpretation, given in the course of the negotiation of the Treaty, was that facts indicating that the purpose of a particular activity is to acquire a nuclear explosive device would tend to indicate non-compliance. (Thus, the construction of an experimental prototype nuclear explosive device would be covered by the

term ‘manufacture’ as would be the production of components which would only have relevance to a nuclear explosive device.).<sup>10</sup>

This formulation is sometimes known as the Foster criterion, after William Foster, director of the US Arms Control and Disarmament Agency. The delineations here are not entirely clear. Some argue that all activities are lawful until such time as a country has actually assembled a nuclear device. For instance, Dan Joyner, a professor of law from Alabama University, has argued that ‘the plain meaning of the term “manufacture” in Article II thus refers to the physical construction of a nuclear explosive device, or perhaps at its broadest reading, to the physical construction of the component parts of a nuclear explosive device.’<sup>11</sup> This interpretation means that activities such as conducting research and development into weapons would generally be considered lawful.

As the use of a term should have consistent meaning throughout the treaty, it also means that nuclear weapon states, in theory, would be allowed to assist other states in weapon-related research, as long as they do not participate in the final assembly of the device. State practice along those lines would seriously undermine the objectives of the treaty as stated in the preamble, namely that ‘the proliferation of nuclear weapons would seriously enhance the danger of nuclear war’.<sup>12</sup> Hence, this interpretation is, to paraphrase the Vienna Convention on the Law of Treaties, manifestly absurd.

In his testimony to US Congress, Foster also noted that:

It may be useful to point out, for illustrative purposes, several activities which the United States would not consider per se to be violations of the prohibitions in Article II. Neither uranium enrichment nor the stockpiling of fissionable material in connection with a peaceful nuclear program would violate Article II so long as these activities were safeguarded under Article III. Also clearly permitted would be the

<sup>10</sup> Goldblat (note 9), p. 102.

<sup>11</sup> Joyner, D., ‘Iran’s nuclear program and the legal mandate of the IAEA’, JURIST Forum, 9 Nov. 2011, <<http://jurist.org/forum/2011/11/dan-joyner-iaea-report.php>>.

<sup>12</sup> Treaty on the Non-Proliferation of Nuclear Weapons (Non-Proliferation Treaty, NPT), opened for signature 1 July 1968, entered into force 5 Mar. 1970, INFCIRC/140, preambular para. 2.



development, under safeguards, of plutonium fueled power reactors, including research on the properties of metallic plutonium, nor would Article II interfere with the development or use of fast breeder reactors under safeguards.<sup>13</sup>

A more functionally consistent interpretation of the treaty is simply that any fuel cycle activity intended to support the acquisition of a nuclear device would be a matter of non-compliance with the NPT. This interpretation is fully consistent with Foster's Congressional testimony, an interpretation that has not been challenged by any other party to the treaty. Any other interpretation puts the functionality, indeed the very utility, of the treaty at risk.

The importance of effective safeguards, from this perspective, cannot be understated. It was also highlighted during the negotiations of the treaty. For instance, the Foster criterion continues to note that 'again, while the placing of a particular activity under safeguards would not, in and of itself, settle the question of whether that activity was in compliance with the treaty, it would of course be helpful in allaying any suspicion of non-compliance.'<sup>14</sup> There are obvious difficulties in verifying the nature of certain types of activities, and in particular those that relate directly to the weaponization of a device. These difficulties are compounded by a perceived lack of mandate for international organizations to verify weaponization. Goldblat, again, notes in his book *Arms Control*, that 'the NPT does not provide for means to verify whether parties are engaged in developing prototype nuclear devices or weapon components'.<sup>15</sup> This is discussed at some length in section III below.

States parties to the NPT have affirmed the centrality of their non-proliferation obligations under the treaty. In 2010, for example, states parties reaffirmed 'that every effort should be made to implement the Treaty in all its aspects and to prevent the proliferation of nuclear weapons and other nuclear explosive devices, without hampering the peaceful uses of nuclear energy by States parties to the Treaty.'<sup>16</sup> The latter observation is very important, naturally. Some parties

to the treaty fear that an overly loose interpretation may lead to infringements on their ability to develop nuclear energy. The same cluster of states usually also views strategic trade controls, such as nuclear export controls, with some suspicion.

However, in response to such concerns it is fair to say that a deregulation of the trade in nuclear materials, facilities or otherwise sensitive equipment would harm the market rather than facilitate its growth. Nuclear suppliers, predominantly in the West, would currently be cautious about supplying a state if the end-use of their supplies were in question. States parties also highlighted this in 2010, when they recognized 'that breaches of the Treaty's obligations undermine nuclear disarmament, non-proliferation and peaceful uses of nuclear energy.'<sup>17</sup>

It is undeniably the case that many non-nuclear weapon states, which have to deal with inspections and export control regulations, feel that they are carrying the overwhelming weight of the treaty. In addition, it is their commitment to the central tenet of the agreement that is the pact's main benefit. As noted above, it may well be that most states tend to support the objectives of the NPT simply because it is normatively the right thing to do. Unrestrained nuclear weapon proliferation, many countries may argue, is not in their best interest. Therefore, several non-nuclear weapon states, both in the developing world and in the West, repeatedly make the case that nuclear weapon states also need to make considerable progress on their disarmament obligations. Unless one subscribes to the idea that some nuclear weapon states are more responsible than others (and some do), the possession of nuclear weapons by any state is detrimental to one's national interest, in particular national security.<sup>18</sup>

### **Momentum of and support for the treaty**

It is often asserted that the non-proliferation regime is under strain, and the sometimes acrimonious NPT review process has perhaps contributed to this perception, because countries have started to feel that the main objectives of the treaty are being undermined.

Although key participants, such as China, France and South Africa, that were outside the NPT for many years have subsequently acceded to it, some important

<sup>13</sup> Foster criteria, quoted by Acton, J., 'What does Article IV mean?', *Arms Control Wonk*, 22 Aug. 2008, <<http://guests.armscontrolwonk.com/archive/2007/what-does-article-iv-mean>>.

<sup>14</sup> Acton (note 13).

<sup>15</sup> Goldblat (note 9), p. 102

<sup>16</sup> 2010 NPT Review Conference, NPT/CONF.2010/50 (Vol. I), p. 2, para. 1.

<sup>17</sup> 2010 NPT Review Conference (note 16), p. 3, para. 8.

<sup>18</sup> Efforts to accelerate worldwide nuclear disarmament are covered in Müller, H., 'The NPT review process and strengthening the treaty: disarmament', *Non-Proliferation Papers* no. 10, Feb. 2012.

countries are unconstrained by the treaty. Pakistan, India and, it should be added, Israel, never signed up to the treaty in the first place. Their security calculus seems to have been that nuclear weapon possession, not abrogation, would better serve their national interest. There are no indications that this calculus has changed, despite the disarmament rhetoric that sporadically emerges from these non-parties. And, recently, while not being parties to the treaty itself, they have all started to sign up to the basic obligations that underpin the pact. Both India and Pakistan, for instance, have enacted wide-ranging export control legislation. And Israel remains supportive, in rhetoric, of the non-proliferation objectives of the treaty, though it has kept silent on the disarmament debate.

As for North Korea, it should be recalled that the country was exceptionally reluctant to join the non-proliferation regime in the first place. Having joined in 1985, it had not been a member for long when concerns started to arise about its activities, and its failure to conclude a comprehensive safeguards agreement within the requisite 18-month period.<sup>19</sup> It issued its first notice of withdrawal in 1993, and finally withdrew completely a decade later. North Korea also withdrew its membership in the IAEA in 1994 after 20 years of participation. North Korea's withdrawal from the NPT sent unfortunate messages to the rest of the treaty membership. Arguing that the country's withdrawal severely undermined the non-proliferation regime is, however, taking it too far.

It would be a more serious matter if Iran were to withdraw from the treaty. It is highly unlikely that an Iranian withdrawal would trigger a collapse of the treaty, but the influence and relevance of the NPT in that part of the world would undeniably be undermined. This is an obvious cause for concern. How the NPT membership decides to deal with Iran will be important. On the one hand, it will remain important to try to persuade Iran to give up those parts of the nuclear fuel cycle deemed especially sensitive—uranium enrichment and the construction of natural-uranium fuelled reactors in particular. If those capabilities are retained, it is fundamental that Iran accept those verification instruments deemed critical by its treaty fellows. On the other hand, it will be equally important for states to garner international

support for a credible enforcement action should Iran decide to withdraw from the treaty. The use of force should rightly be reserved as an action of last resort, but it cannot be summarily dismissed. A unilateral use of force—by a fellow member of the treaty or, especially, by a state standing on the outside—would be highly damaging to the credibility of the entire United Nations system. It will therefore remain exceptionally important to continue to harmonize views within the UN Security Council on matters of last resort.

### III. SAFEGUARDS

As noted above, the safeguards system set up under the NPT is an important barrier to nuclear proliferation. Parties to the treaty need assurance that their fellow treaty members are adhering to their word. They also, in many cases, want to assure their neighbours and allies that they are complying with their obligations. For the most part, participation in an international monitoring regime is therefore a collaborative undertaking. Most states have little or no incentive to cheat or to take advantage of the regime. Some treaty members may, however, feel that the NPT does not provide them with the security assurances they desire. Circumstances may have changed. Their relations with their neighbours may have soured or become hostile. In such circumstances, a state may feel that nuclear weapon possession is in its national security interests. When those reasons are overwhelming, the country may opt to withdraw from the treaty completely. The calculus in those cases is clear. The government would need to weigh the consequences of withdrawal—be they diplomatic, economic or even military—against the benefit of achieving nuclear weapon capability. If the consequences of withdrawal are too steep, a country may opt to engage in clandestine nuclear weapon development while at the same time remaining under the treaty, subject to its verification regime.

The latter scenario entails a calculated risk. IAEA inspectors will continue to visit the country while it engages in its clandestine nuclear weapon effort. If the country's non-compliant behaviour is exposed, it may have risked it all for no gain. As argued above, the proliferation of nuclear weapons is a serious international matter, and suspicions of a country developing weapons of mass destruction have led to war in the past. In other words, both engaging in an evasion strategy and outright withdrawing from the treaty are high-risk strategies. Therefore,

<sup>19</sup> North Korea's comprehensive safeguards agreement (INFCIRC/403) entered into force on 10 Apr. 1992, more than 6 years after its accession to the NPT on 12 Dec. 1985.

an effective verification system increases the cost of non-compliance, and acts as a deterrent to weapons acquisition.<sup>20</sup>

Of course, states parties need to have sufficient warning that one of their number is intending to break its obligations in time for a suitable response. Formulating a response at the international level is a time-consuming undertaking, which means that the system would need to be quite sensitive. It is important, however, to note that any verification regime is just that: a *verification* regime. By itself, it cannot lock-in or prevent nuclear proliferation. Indeed, that response needs to be formulated elsewhere. What verification can do, however, is raise the alarm should something untoward occur. Hence, the IAEA safeguards system acts like a burglar alarm. It will tell you if a window is broken or a door pushed ajar, but it will not in and of itself stop the thief from completing his act. This can only be achieved by convincing the thief to leave (engaging in diplomacy) or by calling the police to take them away (exercising the use of force).

### General verification considerations

There have been few attempts to systemize the art of verification in the academic literature. In general, the process is very heavily information-centric. A verification regime is only as viable as the information it is able to uncover. Guido Den Dekker argues in his book *The Law of Arms Control: International Supervision and Enforcement* that:

A system of international supervision can be more or less comprehensive. At least, international supervision requires, first, information that is (made) available to the supervising body about the behaviour of the subject that is being supervised; second, interpretation by the supervisor of the rule that is applicable to the behaviour of the subject being supervised; third, appreciation by the supervisor

of the conformity to the rule of the behaviour of the subject that is supervised.<sup>21</sup>

In most cases, the most valuable information is that voluntarily supplied by the monitored state itself. Under the IAEA safeguards system, a state supplies a wide array of information, mostly related to the location and intended use of nuclear material in its possession or under its control. Many aspects of the verification regime are covered below.

Den Dekker's description of the process is very useful, as it can be used as a framework for assessing the stringency of a verification regime. If the regime is unable to collect or collate information, it will be meaningless. Without reliable information on which to base a compliance judgement, decision makers will be forced to resort to speculation and semi-informed guesses. This is hardly an optimal outcome.

On the other hand, if it is *too* able, it may collect information not entirely relevant to the purpose of the verification regime. This will have implications as well. In particular, it may collect national security-related information unrelated to the verification regime, which has the potential of putting the monitored state party at risk. For instance, an inspection under the Anti-Personnel Mine Ban Convention may take place in a storage site that also holds a large number of conventional munitions. By collecting information on these munitions (e.g. by looking at manifests or storage capacity displays), they may be able to deduct the total stockpile of the country in question. In a similar way, an IAEA inspection of a military site may come across information best kept to the country itself.

The main problem, however, often lies in the verified norm. Some are fundamentally unclear, and open to interpretation. All the information in the world cannot help a decision-maker to reach an informed decision on compliance if there is little to judge compliance against. To use the burglary example above: the monitoring system may be able to detect a thief breaking a window but this is of no use in circumstances where there is no clear rule against doing so (and the thief remains on the front porch, stopping short of actually breaking in).

The discussion section II above highlights that there is some confusion as to what the treaty actually prohibits. This is very unfortunate. In many ways, the case against Iran resembles the example above: it

<sup>20</sup> The deterrence function is explicitly mentioned in INFCIRC/153. Para. 28 explains that the objective of safeguards is the 'timely detection of diversion . . . and deterrence of such diversion by the risk of early detection'. IAEA, 'The structure and content of agreements between the Agency and states required in connection with the Treaty on the Non-Proliferation of Nuclear Weapons', INFCIRC/153 (Corrected), June 1972.

<sup>21</sup> Den Dekker, G., *The Law of Arms Control: International Supervision and Enforcement* (Martinus Nijhoff: Hague, 2001), p. 101.

could be said that Iran is standing on the porch, and it has clearly broken a window or two, but has it done anything wrong? In situations like this, it is hardly much use to blame the alarm for working as it should. The responsibility rightly belongs elsewhere, namely with those entities that are supposed to act on the trespasser.

### Safeguards before the NPT

The IAEA has two primary objectives: to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world; and to ensure that assistance provided by it, or at its request or under its supervision or control, is not used to further any military purpose. Some see the two objectives as contradictory, since the spread of peaceful nuclear energy often equates to the spread of knowledge about nuclear weapon-relevant technology. The NPT safeguards system is focused on nuclear material, and divides these materials into ‘special fissionable material’, which can be used in a programme to develop an atomic bomb with relative ease, and ‘source material’, which needs to be processed to be usable. Those materials are defined in Article XX of the IAEA Statute.

The IAEA Statute forms the basis of the safeguards system. Its drafters anticipated that Agency safeguards would be required as a consequence of bilateral or multilateral agreements. However, prior to the entry into force of the NPT, safeguards were applied almost exclusively as a condition insisted upon by nuclear suppliers. The IAEA was therefore authorized to establish and administer safeguards to ensure that supplied nuclear material, services, equipment, facilities and information specified under each agreement were not used in such a way as to further any military purpose. At the request of a state, safeguards could also be applied to any of that state’s activities in the field of atomic energy.

Emphasizing the IAEA’s supportive and non-intrusive nature, the Statute stipulates that the Agency’s activities shall be carried out with due observance of the sovereign rights of states.

Among other things, the Statute gives the Agency the right to examine specialized equipment and facilities, to require the maintenance and production of operating records, and to call for and receive progress reports. To facilitate verification, the Statute also gives the IAEA the right to send inspectors, whom it designates, after consultations with the state concerned. However,

inspectors must be escorted by representatives of the state if the state so requests. But as the Statute is not self-executing, the implementation of safeguards requires an agreement with the state concerned.

Despite the notable emphasis on safeguards by the negotiators of the IAEA Statute, there were no serious proposals for applying IAEA safeguards in the three nuclear weapon states that existed at the time or in Eastern Europe. The open question, and the most debated, was how to apply safeguards in Japan, Western Europe and certain developing countries, which at that time had embarked on massive nuclear power programmes. The Agency’s role in those early days seemed to be curtailed in its infancy, as Europe preferred to safeguard its nuclear industry regionally.

In 1959 the first objects were put under IAEA safeguards: a Japanese research reactor and its fuel. It quickly became clear that to apply safeguards on an ad hoc basis would be both time consuming and controversial, so the IAEA began to develop general guidelines for verification.<sup>22</sup>

In 1961, despite opposition from India and the Soviet Union, the IAEA approved a set of complex principles and procedures for verification of research reactors. These were followed by guidelines for Agency inspectors, which in practice restricted the degree of their access to routes and locations designated by the state.

It was clear that many governments resented the idea that foreign inspectors, perhaps from hostile states, would be allowed to inspect the elements of national technology which were deemed most sensitive in both economic and national security terms.

The situation changed somewhat in 1963 when the Soviet Union changed direction, announcing that it had always supported the concept of nuclear safeguards. A complete review of the safeguards system ensued and it was decided to extend it to cover large reactor facilities.<sup>23</sup>

<sup>22</sup> See e.g. IAEA, ‘The Agency’s safeguards system’, INFCIRC/66/Rev.2, 16 Sep. 1968.

<sup>23</sup> Fischer, D., *History of the International Atomic Energy Agency* (IAEA: Vienna, 1997), p. 249. Fischer’s account of the Soviet Union’s reversal of position is, of course, much more lively, ‘In explaining his vote, Ambassador Vassily Emelyanov informed a startled audience that, as the Governors knew, the Soviet Union had always regarded the application of safeguards as the most important task of the Agency. This dramatic change may have taken the Board by surprise but it was very welcome to the IAEA Secretariat and to the governments that had supported IAEA safeguards from the start.’



A revised system followed in 1965, which included additional provisions for reprocessing plants and safeguarded nuclear material in conversion and fabrication plants. The improved safeguards system was completed in 1968. It incorporates two principal elements: first, the state is to declare its holdings to the IAEA; and second, the IAEA is to verify that the state's declarations are correct.

### Safeguards under the NPT

The entry into force of the NPT heralded a change in nuclear safeguards. The treaty states that:

Each non-nuclear-weapon State Party to the Treaty undertakes to accept safeguards, as set forth in an agreement to be negotiated and concluded with the International Atomic Energy Agency in accordance with the Statute of the International Atomic Energy Agency and the Agency's safeguards system.

With the entry into force of the NPT, each subscribing non-nuclear weapon state is obligated to bring into force a safeguards agreement with the IAEA no later than 18 months after the start of negotiations (which may not start later than the date when the state deposited its instrument of ratification or accession). The Agency again engaged in a review of its system, which resulted in agreement on a document, INFCIRC/153 (Corr.), which serves as a basis for what are commonly called comprehensive safeguards agreements or CSAs.<sup>24</sup>

The IAEA NPT safeguards system does not aim to verify compliance with articles I or II of the treaty. Rather, declarations and inspections are intended for verification of compliance with the technical objective established in the safeguards agreement itself.

The basic undertaking by the state is formulated in paragraph 1 of INFCIRC/153, where the state undertakes to

accept safeguards, in accordance with the terms of the Agreement, on *all* source or special fissionable material in all peaceful nuclear activities, within its territory, under its jurisdiction or carried out under its control anywhere, *for the exclusive purpose of verifying that such material is not diverted to nuclear weapons or other nuclear explosive devices.* (emphasis added).

However, the objective of safeguards is slightly different. In paragraph 28 of INFCIRC/153, the parties accept that the objective is

the timely detection of diversion of significant quantities of nuclear material from peaceful nuclear activities to the manufacture of nuclear weapons or of other nuclear explosive devices *or for purposes unknown*, and deterrence of such diversion by the risk of early detection. (emphasis added).

The first iteration of the comprehensive safeguards system relied heavily on material accountancy. INFCIRC/153 clearly highlights that that 'the use of material accountancy [is] a safeguards measure of fundamental importance, with containment and surveillance as important complementary measures.'<sup>25</sup> The safeguards system itself can be difficult to fully comprehend. It has evolved over time, incorporates several authorities, and is implemented by a secretariat. Essentially though, the organization works in ways very similar to that of a tax authority. In tax law, the individual often submits a declaration to the authority which first checks it for correctness and completeness and then decides on the final tax for the year. Under the safeguards system, the state submits reports, or declarations, on all nuclear material which is subject to safeguards. The Agency then checks whether the declarations are correct and complete. If the declarations do not check out, in any of those aspects, the organization reports this to its member states.

The system involves a number of different report types. The *initial report* is supposed to be sent to the Agency within 30 days of the end of the month in which the agreement enters into force. The IAEA assesses the report and may conduct *ad hoc inspections* to verify its correctness and completeness. The state is also

<sup>24</sup> IAEA, INFCIRC/153 (Corr.) (note 20). Note, however, that INFCIRC/153 is not technically speaking a model agreement: the model is published in IAEA, Board of Governors, 'The standard text of safeguards agreements in connection with the Treaty on the Non-Proliferation of Nuclear Weapons', GOV/INF/276, 22 Aug. 1974, annex A. INFCIRC/153 also uses a 'paragraph' system, whereas the safeguards agreements use 'articles'.

<sup>25</sup> IAEA, INFCIRC/153 (Corr.) (note 20), para. 29.

required to file *accounting reports*, and *semi-annual statements of book inventories*. These are then verified through routine inspections. The purpose of these inspections is to check that the location, identity, quantity and composition of safeguarded materials are consistent with the reports and the operating records of the facility or location in question. The frequency of inspections depends on the size of the facility and the type of material safeguarded. In general, the bigger the facility, and the more usable the material is for weapons purposes, the more often the IAEA will visit to check that the balances are as declared.

The special inspection tool itself has been around for a while. It features in item-specific safeguards agreements as well as in comprehensive safeguards agreements. Under a comprehensive safeguards agreement, an inspection is deemed to be special when it is either (a) additional to the routine inspection effort provided for in the agreement (i.e. greater frequency) or (b) involves access to information or locations in addition to the access for ad hoc and routine inspections.

There are two principal routes to getting a special inspection agreed. First, the state itself can submit a special report, which will then have to be verified by a special inspection. Second, the IAEA may consider that information made available to it by the state (including explanations from the state as well as information gathered through routine inspections) is not adequate for it to fulfil its responsibilities under its comprehensive safeguards agreement. In the latter case, the IAEA should, in other words, have some indication that not all relevant nuclear material, or relevant facilities, in the country has been declared.

Prior to 1991, special inspections were invoked on only three occasions, all three to declared locations. Subsequently, special inspections have so far been invoked in two other instances. The first, on the invitation by the Romanian Government, aimed to clear up misunderstandings surrounding the country's large nuclear fuel cycle and previously undeclared reprocessing-related activities. The second was invoked by the IAEA Secretariat against North Korea, after information had come to light that indicated that the country had not been entirely forthcoming in its initial declaration. Thus, the IAEA has some experience in invoking special inspections using both of the two principal routes. The problem with special inspections is that the state is unlikely to accede to such a request unless it has initiated the inspection itself through

the submission of a special report. There is only one case, of course, to base this conclusion on, and that is North Korea. It still makes sense to assume that this is the likely outcome. If the state is hiding something, it will have little incentive to invite inspectors to view the secrets it wishes to protect. It could attempt to control the special inspection, by having an elaborate deception strategy in place. If the IAEA, for instance, requests access to installations that are not relevant to its nuclear programme, the state could even afford this access. After the fact, it could broadcast to the world that it had done everything that the IAEA had asked for—and that the Agency had found nothing. But the risk is, of course, that the IAEA will know what it is looking for. And once the precedence of giving access has been set, it is very difficult to backtrack.

So, in most cases where an inspection is called against the will of the inspected state, it is likely to go straight to the Board of Governors for further action. Unless the state is under intense international pressure, a special inspection request is therefore likely to shut down the Agency's investigation before it has even started. This, naturally, does not progress the investigation at all. A special inspection should, from that perspective, only be called if there is a reasonable chance that the state will accommodate it.

From another perspective, however, it may be desirable to call the inspection anyway. If the Director General of the IAEA feels that there is little room for further progress in inspections, he may feel inclined to draw the line under the effort by invoking this inspection tool. This would, after all, signal that the Agency is close to drawing a conclusion that it can no longer certify that all nuclear material remains in peaceful use. The special inspection request represents 'the final offer' from the Agency, after which the issue can be raised with the UN Security Council. This threat could, possibly, act as an incentive for the stalling state to cooperate with inspectors.

### **Strengthened safeguards**

After the 1991 Gulf War, it was revealed that Iraq had developed a parallel nuclear programme over the previous decade. Since the safeguards system as it was implemented up to that time was based on state declarations and material accountancy in declared facilities, Iraq's comprehensive safeguards agreement had provided less than sufficient information to detect diversion. Beginning in the early 1990s, the Agency

started to review the safeguards system. The first question it sought to address was what additional measures could be taken under its existing authority.

In parallel to this review, the IAEA also embarked on an ambitious programme called 93+2. This aimed to establish what additional authority the Agency needed to fulfil its verification tasks. The result was the adoption in 1997 of the so-called Model Additional Protocol. This model serves as the basis for individual additional protocols to safeguards agreements. An additional protocol is not a stand-alone document.

The resulting improvements to the system have best been summarized by Jill Cooley the *Verification Yearbook 2003* as follows.<sup>26</sup>

*Additional measures under the comprehensive safeguards agreements*

- State provision of design information on new facilities or on changes in existing facilities handling safeguarded nuclear material as soon as the state authorities decide to construct, authorize construction of or modify a facility; and the IAEA's continuing right to verify the design information over the facility's life cycle, including decommissioning.
- Enhanced Agency evaluation of information from a state's declarations, Agency verification activities and a wide range of open and other sources (e.g. the scientific literature, news articles, satellite imagery, and third parties).
- State voluntary reporting on inventories, imports and exports of nuclear material and exports of specified equipment and non-nuclear material (components of this scheme are incorporated in the Model Additional Protocol).
- Agency use, to a greater extent than previously, of unannounced inspections within the routine inspection regime.
- Agency collection of environmental samples in facilities and at locations where, under safeguards agreements, IAEA inspectors have access during inspections and design information visits; and sample analysis at the IAEA Clean Laboratory and/or at qualified laboratories in member states.
- Provision of enhanced training for IAEA inspectors and safeguards staff and for member

state personnel responsible for safeguards implementation.

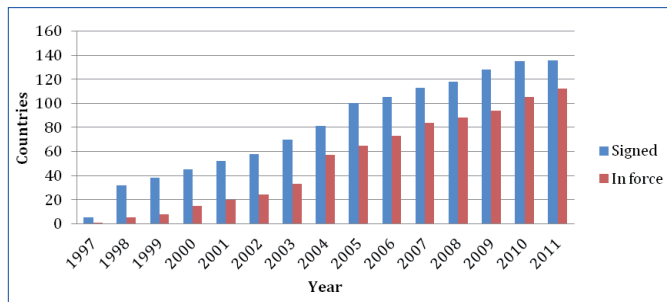
- Agency use of unattended and remote monitoring of movements of declared nuclear material in facilities and the transmission of authenticated and encrypted safeguards-relevant data to the Agency.
- Closer cooperation between the Agency and the state (and regional) systems for accounting for and control of nuclear material in member states.

*Measures under additional protocols signed and in force*

- State provision of information about, and IAEA inspector access to, all parts of a state's nuclear fuel cycle, from uranium mines to nuclear waste and any other location where nuclear material intended for non-nuclear uses is present.
- Agency collection of environmental samples at locations beyond those provided under safeguards agreements.
- State provision of information on, and short notice access by the Agency to, all buildings on a nuclear site.
- State acceptance of IAEA designations of inspectors and issuance of multiple entry visas (valid for at least one year) for inspectors.
- State provision of information about, and Agency verification mechanisms for, a state's research and development activities related to its nuclear fuel cycle.
- Agency right to make use of internationally established communications systems, including satellite systems and other forms of telecommunication.
- State provision of information on the manufacture and export of sensitive nuclear-related technologies, and IAEA verification mechanisms for manufacturing and import locations in the state.
- Wide area environmental sampling, after Board approval of procedural arrangements for such sampling and after consultations with the state concerned.

The Model Additional Protocol was negotiated by all IAEA member states. Despite this, there was initial reluctance by many member states to conclude an additional protocol (see figure 1). There are several reasons for this. In some countries, the additional protocol has been perceived as a political tool, used to put political pressure on regional neighbours. Some

<sup>26</sup> Cooley, J., 'Integrated nuclear safeguards: genesis and evolution', *Verification Yearbook* (VERTIC: London, 2003).



**Figure 1.** Additional protocols signed and in force, 1997–2011

Source: IAEA.

states, for instance, argue that they will conclude an additional protocol only should their neighbour conclude one. This is unfortunate, as it strongly implies that some states do not see an intrinsic security value in an additional protocol itself. For other states, safeguards are simply not high enough on the legislative agenda of the country. The state may have many other priorities that are deemed more urgent—such as its economy, the environment or social justice. Issues such as an additional protocol are hence stuck as a middle priority for the legislature (which would need to ratify the agreement) for many years. Yet other countries simply lack the necessary capacity to implement an additional protocol properly. With the recent uptake in additional protocols, the Agency has seen some governments simply ratify them without having any supporting legislative infrastructure in place. As one IAEA staff member put it,

in one country, we saw one person fill out NIL [“nothing to declare”] declarations quarter after quarter. When we asked how the country collected that information, it turned out that there was no procedure in which he could communicate with relevant government departments or industry. They were just ticking the box.<sup>27</sup>

If true, and if this is the state of implementation in more countries, there is a clear need for concerted and intensified legislative and regulatory assistance by both the IAEA and its more endowed member states.

## Integrated safeguards

The IAEA is presently undertaking a programme to integrate these two documents into one integrated safeguards system. This regime is currently in force in 57 states, and is best described in the IAEA’s conceptual framework paper as follows.<sup>28</sup>

The aim of ‘integrated’ safeguards is to provide the most efficient means to realize the full effectiveness of the strengthened safeguards system. The measures of the Model Additional Protocol were never intended to be simply superimposed as a new ‘layer’ of activity on top of safeguards as implemented under INFCIR/153 (Corrected) and earlier strengthening measures. Given the additional assurances provided under an additional protocol, the need to avoid undue burden on States and facility operators, and the need for maximum efficiency in the light of the prevailing resource constraints, the new measures were to be ‘integrated’ with existing ones. Effectiveness and efficiency have therefore each been given full consideration as approaches for integrated safeguards have been developed.

In addition, integrated safeguards is defined as

the optimum combination of all safeguards measures available to the Agency under comprehensive safeguards agreements and additional protocols which achieves the maximum effectiveness and efficiency within available resources in fulfilling the Agency’s right and obligation in paragraph 2 of INFCIRC/153 (Corrected).

Four fundamental principles support the integrated safeguards system:

1. *Non-discrimination between states.* The safeguards system is designed to be implemented in roughly the same way in all countries. The integrated safeguards system will not change this underpinning. It may lead to a decreased inspection burden in some states, and

<sup>27</sup> Personal communication with IAEA member of staff, Sep. 2011.

<sup>28</sup> IAEA, Board of Governors, ‘The conceptual framework for integrated safeguards’, Report by the Director General, GOV/2002/8, 8 Feb. 2002.



an increased burden in others. But the main point is that this adjustment of inspection effort is governed by objective criteria.

2. *Information review and evaluation.* Integrated safeguards are only to be applied in countries where the IAEA have reached a *broader conclusion* on the absence of undeclared nuclear activities in the state as a whole. This is done through an evaluation of the consistency of the country's declared nuclear programme with the verification activities undertaken under the comprehensive safeguards agreement *and* the additional protocol. In addition, the Agency checks its consistency with all other information available to the organization.

However, in order for the IAEA Secretariat to draw a firm conclusion, it would need to have, in the words of the organization's safeguards statement for 2010:

- conducted a comprehensive State evaluation based on all information available to the Agency about the State's nuclear and nuclear-related activities (including declarations submitted under the additional protocol, and information collected by the Agency through its verification activities and from other sources);
- implemented complementary access, as necessary, in accordance with the State's additional protocol; and
- addressed all anomalies, questions and inconsistencies identified in the course of its evaluation and verification activities.<sup>29</sup>

3. *Coverage of acquisition paths.* Integrated safeguards make good use of the so-called physical model during the assessment of whether the Agency can conclude that there is no undeclared material in the country as a whole. The physical model is, in a nutshell, a representation of the material flows within the nuclear fuel cycle as a whole. It identifies all possible pathways, with all types of material properly defined, to a nuclear weapon. This is a powerful analytical tool when combined with other safeguards data. By looking at the flows of materials, it is easier to see whether there is obvious overcapacity in some areas of the country's nuclear fuel cycle. Say, for instance, that a country has extensive mining capacity, but very little capacity in terms of conversion. Say that the mines produce large

quantities of ore, the conversion facility receives very little material, and there are no export receipts. In those cases, it may be pertinent to ask whether there might be an undeclared conversion facility on the territory of the state. As noted by Australian safeguards specialists Russell Leslie, Craig Everton and John Carlson,

in large part the [physical model] was developed to guide the IAEA's processes of information collection, review and evaluation, but the utility of the [physical model] has been more broadly recognised by the IAEA and it serves major roles in the state evaluation and in the design information analysis processes.<sup>30</sup>

4. *Nuclear material accountancy* therefore remains a safeguards measure of fundamental importance.

### The future of safeguards

In his final speech to the General Conference in 2009, the IAEA Director General, Mohamed ElBaradei, pointed towards a lacuna in the safeguards regime. He said that 'although the Agency's verification mandate is centred on nuclear material, to preclude the possibility of undeclared nuclear material and activities in a country, it may be necessary for us to pursue alleged weaponization activities'.<sup>31</sup> Investigations into weaponization cannot be made through accountancy, which means that the IAEA needs to employ methods similar to those used by law enforcement: interviews, forensics and reliance on member state supplied intelligence. For some members, this is clearly a bridge too far. It is undeniably true that intrusive investigations lead to controversy. ElBaradei recognized this in his speech. He highlighted that 'we must let diplomacy and thorough verification take their course, however lengthy and tiresome the process might be. We need to carefully assess the veracity of intelligence information so as not to let verification turn into a witch hunt.' The latter point is extremely important, and relates both to the way the

<sup>30</sup> Leslie, R., Everton, C. and Carlson, J., 'Revisiting the practices and technical objectives of safeguards', Paper presented to the Annual Meeting of the Institute of Nuclear Materials Management, Baltimore, Maryland, 11–15 July 2010.

<sup>31</sup> ElBaradei, M., IAEA Director General, 'Looking to the future', IAEA General Conference 2009, 14 Sep. 2009, <<http://www.iaea.org/newscenter/statements/2009/ebsp2009n011.html>>.

<sup>29</sup> IAEA, 'Safeguards statement 2010', <<http://www.iaea.org/OurWork/SV/Safeguards/es/es2010.html>>, para. 12.

IAEA safeguards its independence and the way the organization handles potentially sensitive information.

It should be noted, however, that the IAEA's right to conduct investigations into weaponization is largely unchallenged by its member states. Few have raised procedural objections to the IAEA's examination of possible military dimensions of Iran's nuclear programme. And the legal authority is there also. In 2009, the International Commission on Nuclear Non-proliferation and Disarmament stated that, since weaponization activities indicate intended, if not actual, diversion of nuclear material, they are clearly covered by the Agency's responsibility to give timely warning of diversion.<sup>32</sup> Moreover, in the case of special inspections, for instance, it is important to observe that this tool may be deployed even if there is no nuclear material at the site that the Agency desires to access.

Thus far, the IAEA has opted to resolve concerns regarding the completeness and correctness of a state's declaration through negotiation, consultation and informal visits. Strictly speaking, some of its activities in recent times could have been called special inspections (as access have been given to information or locations not strictly covered by the comprehensive safeguards agreement).

In their paper 'Revisiting the practices and technical objective of safeguards', Leslie, Everton and Carlson convincingly argue that 'new challenges and processes require new ways of thinking'. But they also say that formidable challenges may need to be overcome. Perhaps not surprisingly, some of these challenges are internal. They write

While the safeguards system has adapted over time, the system has a lot of internal inertia. This inertia arises from:

- the legal limitations imposed upon the IAEA by its members states (inter alia, via the Statute, the NPT and the various safeguards agreements);
- the expectations of the member states as expressed through the decisions of the Board of Governors and the resolutions of the General Conference;
- the management vision of the Director General, the Deputy Director General for Safeguards,

and the various Safeguards Division Directors; [and]

- the day to day approaches of the Section Heads, their senior inspectors, country officers, facility officers and inspectors in the field.<sup>33</sup>

It is difficult to get a large organization such as the IAEA to change course radically in an effective way. Even if the strenuous climate in the IAEA Board of Governors and the General Conference were to defrost, it would require significant management skills by the Director General and his senior staff in trying to convince and encourage their subordinates to adapt to new ways of doing business. The relatively recent reorganization at the top of the IAEA, the creation of the Director General's Office for Policy, may well be a step in the right direction.<sup>34</sup> But undeniably, more change is needed within the IAEA Secretariat itself.

#### **Other means to strengthen the operation of the regime**

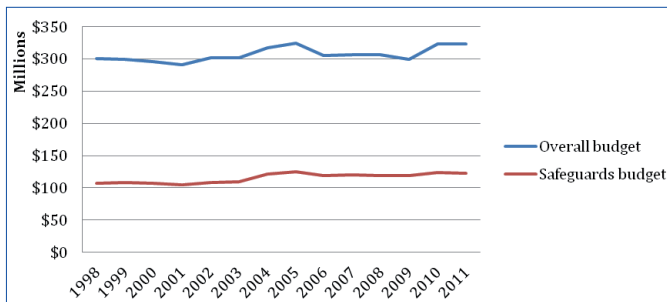
One way of making the safeguards system more understandable for academia and the general public would be to make the full Safeguards Implementation Report public. This report, which is issued by the Director General to the Board of Governors in June each year, is only released in redacted form on the IAEA website, with much of the underlying analysis removed. Also removed is the performance analysis which, at a glance, gives member states information on how well the Agency meets its timeliness and quantity goals. Recently, and very helpfully, the Agency has also started to distribute, to member states only, some information on how much the system actually costs. This information has, according to sources inside the IAEA, been difficult to compile, mostly since the various departments have not been used to financial reporting to that level of detail before.<sup>35</sup> Previously, it has only been possible to get a sense of the cost involved by looking at the declared number of person-days of inspections and dividing that number across the total safeguards budget. In times of strained financial resources, the Agency is facing increased competition for funds. Relative transparency in financial figures could, from that perspective, be beneficial to the organization.

<sup>32</sup> International Commission on Nuclear Non-proliferation and Disarmament (ICNND), *Eliminating Nuclear Threats: A Practical Agenda for Global Policymakers* (ICNND: 2009), p. 85.

<sup>33</sup> Leslie et al. (note 30).

<sup>34</sup> Shirazi, M., 'DG Amano outlines organizational change at IAEA', *Trust and Verify*, no. 132 (Jan.–Mar. 2011).

<sup>35</sup> Personal communication, Department of Safeguards, Nov. 2010.



**Figure 2.** Adjusted IAEA budgets, 1998–2011

Source: IAEA.

This is not to say that member state financial support for the IAEA has been overwhelming in good financial times. As early as 2004, the US Government Accountability Office (GAO) highlighted that the IAEA was overwhelmingly dependent on US funding. Back then, the GAO wrote that ‘IAEA’s safeguards program remains underfunded because its budget has not kept pace with increases in its workload and responsibilities’.<sup>36</sup> Despite a slight increase in the Agency’s regular budget over the past few years, this remains largely the case (see figure 2). This was recognized by the IAEA Director General, Yukiya Amano, at the 2011 General Conference. He noted that the organization had ‘worked hard to identify and eliminate lower priority activities, as well as to improve efficiency’. He also noted, however, that ‘a reasonable increase in resources will clearly be needed in the coming years to meet new and expanding demands for assistance from Member States in nuclear safety and in other areas’.<sup>37</sup> However, many members have been reluctant to support ambitious budget increases, and have instead focused on ways to make the system itself leaner. While it is undeniably important to always seek efficiencies, member states risk cutting too deep, leaving the IAEA in the best case unable to respond to an increased workload, and in the worst scenario actually forced to scale down on its verification activities.

The US administration of President George W. Bush managed to push through a slight budget increase in the mid-2000s, and some of it was eaten up by inflation

<sup>36</sup> US Government Accountability Office (GAO), *IAEA Has Strengthened Its Safeguards and Nuclear Security Programs, but Weaknesses Need to Be Addressed*, GAO-06-93 (GAO: Washington, DC, Oct. 2005), p. 39.

<sup>37</sup> Amano, Y., IAEA Director General, ‘Statement to Fifty-Fifth Regular Session of IAEA General Conference 2011’, 19 Sep. 2011, <<http://www.iaea.org/newscenter/statements/2011/amsp2011n021.html>>.

in the following years. In 2011 the IAEA received another moderate budget increase above inflation. The US administration of President Barack Obama has continued to advocate an increase in the Agency’s regular budget, but to little avail. Resistance seem to come mainly from European states.<sup>38</sup> Unless states parties show some real commitment to shoring up the Agency’s budget, the rather pessimistic forecast of the GAO is bound to become reality. It may be a bitter pill to swallow in periods of budget austerity, but one that needs to be swallowed nevertheless.

One Vienna-based diplomat characterized the situation as ‘disgraceful’, pointing out that the Agency had to ‘beg on its knees’ to get money for the recent expansion of its Vienna-based laboratory. It is difficult to disagree, especially when considering that the old laboratory allegedly was on the verge of being deemed unsafe to work in.<sup>39</sup> States may be serious in their statements about the centrality of the IAEA in safeguarding nuclear energy. However, they certainly seem less convinced about the utility of shoring up that organization’s financial base.

#### IV. CONCLUSIONS

The non-proliferation regime is in relatively good health. In many ways, it is, in fact, much better off than it was when the NPT was adopted in the early 1970s. The safeguards system has evolved significantly and has become sharper and more sensitive than ever before. More states are parties to the treaty—and adherence to its various instruments is on the rise. However, it would be irresponsible to close ones eyes to potential dangers that lie ahead.

The fraying of the regime in its margins—by the suspected nuclear weapons effort of Iran (and possibly Syria too)—may have serious consequences in the future. In addition, and while this is an often passionately debated point, the continued reliance on nuclear weapons for national security by other states does send an unfortunate message to others. If the possession of nuclear weapons is of paramount importance to some states, then why would it not be of equal importance to others? Legalistic arguments, pointing out that some countries have adhered to the treaty while others have opted out, are technically correct, but not very useful. Even the strongest pacts

<sup>38</sup> Personal communication with European diplomat, Sep. 2010.

<sup>39</sup> Personal communication with Vienna based diplomat, Dec. 2011.

can be abrogated if it is no longer seen as relevant for its members. Force can be used to keep individual states in check, but force quickly loses its utility if many more states decide to forego its non-proliferation commitments. Great care must therefore be exercised when formulating policy.

One example where care was, perhaps, put aside is the so-called Indian–US deal on peaceful nuclear cooperation.<sup>40</sup> This deal underwent final approval by the US Congress on 1 October 2008. The deal has some non-proliferation positives, as highlighted by the IAEA Director General, Elbaradei:

This agreement is an important step towards satisfying India's growing need for energy, including nuclear technology and fuel, as an engine for development. It would also bring India closer as an important partner in the non-proliferation regime . . . It would be a milestone, timely for ongoing efforts to consolidate the non-proliferation regime, combat nuclear terrorism and strengthen nuclear safety.<sup>41</sup>

On 9 July 2008, the IAEA Secretariat distributed 'An Agreement with the Government of India for the Application of Safeguards to Civilian Nuclear Facilities' (GOV/2008/30). This is an umbrella agreement under which India is to successively put many of its nuclear facilities under safeguards. Broadening the reach of the safeguards regime in this way is undeniably a good thing, as it will bring further credibility to the treaty's non-proliferation objectives.

However, the agreement has also had its drawbacks, as it has created a perception of unequal treatment. If India can be exempted, why cannot Israel and Pakistan receive similar treatment? Critics in the USA have called the agreement a reversal of many decades of US arms control policies.<sup>42</sup> And undeniably, the agreement blurs the boundary between a nuclear weapon state and a non-nuclear weapon state.

In 2006 the IAEA Secretariat published a number of recommendations through which the safeguards

system could be improved.<sup>43</sup> Many of those recommendations still stand, and a few are reiterated below (in no particular order).

First and foremost, the Board of Governors should continue to encourage states parties to the NPT which have not yet done so to conclude and implement a comprehensive safeguards agreement, and to call on all states that have concluded such agreements to fulfil their existing legal obligations under them (recommendation 1). This recommendation is quite obvious. It is essential to ensure that the existing safeguards system is fully implemented, as the present situation is unsatisfactory. IAEA safeguards inspectors now have to implement not one, but several, different types of safeguards in several different states. It would seem unwise to encourage further fragmentation of the system at this stage (although preparatory work should be intensified—as is argued below).

In addition, the Board of Governors should request that member states use their bilateral contacts to encourage states parties to the NPT that have not yet done so to also conclude additional protocols to their comprehensive safeguards agreements (recommendation 6). Work here is already underway. The USA has a very active technical outreach programme, offering software solutions to facilitate easy reporting under the protocol. The UK is also considering offering assistance with legislative and regulative implementation, but through independent organizations and in close collaboration with the IAEA Secretariat. Japan has also offered assistance in promoting adherence to additional protocols.

There are a number of voluntary steps that also could be taken. For instance, the Board of Governors could call on states to fulfil voluntary commitments that they have undertaken, such as reporting on separated neptunium and americium (recommendation 5). But perhaps most importantly of all, the Board of Governors could request all states to provide to the Agency relevant information on exports of specified equipment and non-nuclear material, procurement enquiries, export denials and relevant information from commercial suppliers in order to improve the Agency's ability detect possible undeclared nuclear activities (recommendation 10). For the Agency to be able to reach a broader conclusion, this type of

<sup>40</sup> The formal title is the 'U.S.–India Civil Nuclear Cooperation Initiative – Bilateral Agreement on Peaceful Nuclear Cooperation (123 Agreement)'.

<sup>41</sup> IAEA, 'IAEA Director General welcomes U.S. and India nuclear deal', Press release, 2 Mar. 2006, <<http://www.iaea.org/newscenter/pressreleases/2006/prn200605.html>>.

<sup>42</sup> For further analysis and link see Bajoria, J. and Pan, E., 'The U.S.–India nuclear deal', Backgrounder, Council for Foreign Relations, 5 Nov. 2010, <<http://www.cfr.org/india/us-india-nuclear-deal/p9663>>.

<sup>43</sup> IAEA, Recommendations to be considered by the Advisory Committee on Safeguards and Verification within the Framework of the IAEA Statute to Further Improve the Effectiveness and Efficiency of the Safeguards System, Note by the Secretariat, 2006/Note 45.



information should be supplied on a continuous and sustained basis. And it would also, in this context, help to reiterate recommendation 3, that the Board of Governors encourage states to provide information on their past nuclear activities.

The European Union (EU) will have a very important role to play in this. The EU represents the largest market in the world and has considerable financial resources at its disposal despite the recent downturn in global markets and the resulting sovereign debt crisis in parts of the continent. Above everything else, the EU needs to coordinate and promote increased financial support for the IAEA and its mission by signing up fully to the idea of a sustainable increase of the safeguards budget.

In addition to this, the EU should continue to nurture and support existing European initiatives to strengthen the non-proliferation regime, by continuing to lend its active support to entities such as the European Safeguards Research and Development Association and the Joint Research Centre. It should also act to coordinate and fund nationally led outreach initiatives on the IAEA additional protocol.

## ABBREVIATIONS

EU	European Union
GAO	Government Accountability Office
IAEA	International Atomic Energy Agency
NPT	Non-Proliferation Treaty

## A EUROPEAN NETWORK

In July 2010 the Council of the European Union decided to create a network bringing together foreign policy institutions and research centres from across the EU to encourage political and security-related dialogue and the long-term discussion of measures to combat the proliferation of weapons of mass destruction (WMD) and their delivery systems.

## STRUCTURE

The EU Non-Proliferation Consortium is managed jointly by four institutes entrusted with the project, in close cooperation with the representative of the High Representative of the Union for Foreign Affairs and Security Policy. The four institutes are the Fondation pour la recherche stratégique (FRS) in Paris, the Peace Research Institute in Frankfurt (PRIF), the International Institute for Strategic Studies (IISS) in London, and Stockholm International Peace Research Institute (SIPRI). The Consortium began its work in January 2011 and forms the core of a wider network of European non-proliferation think tanks and research centres which will be closely associated with the activities of the Consortium.

## MISSION

The main aim of the network of independent non-proliferation think tanks is to encourage discussion of measures to combat the proliferation of weapons of mass destruction and their delivery systems within civil society, particularly among experts, researchers and academics. The scope of activities shall also cover issues related to conventional weapons. The fruits of the network discussions can be submitted in the form of reports and recommendations to the responsible officials within the European Union.

It is expected that this network will support EU action to counter proliferation. To that end, the network can also establish cooperation with specialized institutions and research centres in third countries, in particular in those with which the EU is conducting specific non-proliferation dialogues.

<http://www.nonproliferation.eu>



## FOUNDATION FOR STRATEGIC RESEARCH

FRS is an independent research centre and the leading French think tank on defence and security issues. Its team of experts in a variety of fields contributes to the strategic debate in France and abroad, and provides unique expertise across the board of defence and security studies.

<http://www.frstrategie.org>



## PEACE RESEARCH INSTITUTE IN FRANKFURT

PRIF is the largest as well as the oldest peace research institute in Germany. PRIF's work is directed towards carrying out research on peace and conflict, with a special emphasis on issues of arms control, non-proliferation and disarmament.

<http://www.hsfk.de>



## INTERNATIONAL INSTITUTE FOR STRATEGIC STUDIES

IISS is an independent centre for research, information and debate on the problems of conflict, however caused, that have, or potentially have, an important military content. It aims to provide the best possible analysis on strategic trends and to facilitate contacts.

<http://www.iiss.org/>



## STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE

SIPRI is an independent international institute dedicated to research into conflict, armaments, arms control and disarmament. Established in 1966, SIPRI provides data, analysis and recommendations, based on open sources, to policymakers, researchers, media and the interested public.

<http://www.sipri.org/>