

IAEA safeguards and the NPT

Ben SANDERS

This paper is written at a time when belief in the efficacy of the international nuclear non-proliferation regime is becoming increasingly shaky. If there had been any doubt that the regime was facing a crisis of confidence, the debates at the recent third session of the Preparatory Committee for the 2005 Review Conference of the Non-Proliferation Treaty (NPT)—the treaty that is the cornerstone of that regime—should have put an end to it. As those discussions showed, the treaty—and with it the regime—is rapidly losing credibility in each of the three areas in which it is supposed to operate: deterring the spread of nuclear-weapon capability ('nuclear non-proliferation'); nuclear disarmament; and the promotion of the peaceful uses of nuclear energy. This article deals with one particular aspect of the nuclear non-proliferation function, namely the verification by the International Atomic Energy Agency (IAEA) of compliance with undertakings not to acquire nuclear weapons—the so-called safeguards. While they, too, are criticized for their perceived shortcomings, the IAEA's safeguards are the one element of the regime that, though surely susceptible to improvement, is widely recognized to work as they are intended to. One must wonder, however, to what extent safeguards will be allowed to go on working if the international community loses its belief in the system that they have been devised to sustain.

Ideas to limit the risk of nuclear proliferation have surfaced from the moment the political world became aware that there was such a thing as an atomic bomb—in fact, almost as soon as it became obvious in principle that such a thing could be created. The story of the attempts that were made to reduce that risk has been often told. Still, it is useful in this context to go over it once again, briefly—all the easier since it is in fact a fairly simple story.¹

The very first resolution of the United Nations General Assembly² dealt with the need to deter the spread of nuclear weapons. In the discussions that followed, the United States, which had meanwhile concluded that 'a system of inspection superimposed on an otherwise uncontrolled exploitation of atomic energy by national governments [would] not be an adequate safeguard'³, presented its so-called Baruch Plan (named after the representative to the UN who submitted it). The Baruch Plan, which held that the only secure way to keep nuclear material and equipment from being misused for military purposes was to bring and maintain all nuclear activities that could lead to such use under the strict control of an International Atomic Development Authority (IADA) and in effect internationalize the nuclear fuel cycle. This ambitious plan failed, in part because by then, although the United States was accused of advancing it in the hope of maintaining its apparent atomic monopoly, others had already begun to work on their own atomic weaponry. The discussions in the UN framework ended in

Ben Sanders is a disarmament specialist and former international civil servant with a particular interest in nuclear verification. He founded and served as executive chairman of the Programme for Promoting Nuclear Non-Proliferation until its termination in 2002.

deadlock. In 1949 the United Nations Atomic Energy Commission (UNAEC) wound up its first formal attempts to tame the powers of the atom. In 1952 the UNAEC was formally abolished by the General Assembly, and with it the idea of an IADA.

Some of those ideas were revived in 1953, in the American 'Atoms for Peace' Plan. In a speech to the UN General Assembly on 8 December of that year, American President Dwight Eisenhower proposed that states that had nuclear material should draw down their military stockpiles and move the material thus withdrawn to an international 'pool' that would be at the disposal of states for peaceful purposes. The plan was based on the assumption that 'the secret' was out but that a substantial measure of control could be assured if states were helped in their nuclear activities, on condition that those activities took place under the supervision (described in the speech as 'the impounding, storage and protection of the contributed fissionable and other materials') of an international agency. This led to the birth of the IAEA in 1957.⁴

As foreseen in the 'Atoms for Peace' Plan, the IAEA's main task was to supply, or to function as the conduit for the supply of nuclear material withdrawn from military stockpiles, and to ensure that this was used safely and not for military purposes; in this respect the plan was to have functioned in the first place as an arms control measure. Through a variety of factors, the supplier's function never really took off, and in addition to the ever-expanding and still-increasing range of non-energy uses that it promotes, the IAEA has been doing a growing amount of work in the regulatory and supervisory areas, notably in applying safeguards against non-legitimate uses.⁵

The safeguards function started modestly. At the beginning there was little demand for the Agency's services. Around that time, in the late 1950s and early 1960s, several states that had acquired a proficiency in such matters, mostly through wartime cooperation with the United States, supplied research reactors to a few select customers on condition that they would be used only for peaceful purposes.⁶ Among them, the United Kingdom and the United States maintained their own supervision over the way such supplies were handled. As this trade increased, however, this supervisory activity posed a growing burden for suppliers, while some of the recipients felt uncomfortable with the periodic presence of inspectors from supplier states.⁷

The Statute of the IAEA provided for just this kind of situation, where it said that the IAEA is authorized '[t]o establish and administer safeguards designed to ensure that [nuclear items supplied by or through the Agency] are not used in such a way as to further any military purpose; and to apply safeguards, at the request of the parties, to any bilateral or multilateral arrangement, *or at the request of a State, to any of that State's activities in the field of atomic energy*'.⁸ This provision enabled states involved in an agreement for the supply or the receipt of nuclear items to let the Agency take over the safeguards function on the items in question. It seems that the phrase was added at the last moment of the negotiations on this part of the Statute, attention having all along been focused on the organization's role as a primary supplier of installations and material. In fact, without a provision of this kind the Agency would not have been able to apply safeguards pursuant to the NPT or of agreements for the denuclearization of given geographical areas, such as the Treaty of Tlatelolco.

The Statute lays down in general terms the rights and obligations of the Agency in applying safeguards. It provides a framework for a safeguards system but it does not specify how those safeguards should be applied; that was left to be worked out in specific agreements with the states concerned. The Agency was asked to do this for the first time in 1958, in connection with the supply to Japan of a small Canadian research reactor. The issue was highly controversial and met with resistance in the Agency's Board of Governors. India reiterated the position it had formally stated in ratifying the Statute (in an argument very similar to the one used fifty years later by members of the Non-Aligned Movement in criticizing the NPT) that safeguards threatened to separate the world into two categories: 'the small and less powerful ones being subject to safeguards while the Great Powers are above them'. The Soviet

Union and its allies saw safeguards as a novel means of spying and an infringement of states' sovereignty, and therefore resisted the creation within the organization's Secretariat of any special unit for this function.⁹ But a majority of the Board decided to set up a division for the purpose and asked it to prepare a set of standard safeguards regulations, containing provisions that could be used in future similar cases, permitting states to see in advance what procedures they could expect, ensuring that similar situations would be dealt with in the same way, and avoiding time-consuming discussions whenever the Agency would be asked to apply safeguards.

The result, in 1961, after long discussions in various expert groups and committees in the Agency's Board of Governors and in its General Conference, was the first 'Safeguards Document', which held principles and procedures for the application of safeguards to reactors up to 100 MW(th)—i.e. mainly research reactors. The same year saw the adoption of the 'Inspectors' Document', which established rules for the designation of safeguards inspectors and for their conduct. This document dealt with an entirely new and controversial issue—the intrusion of representatives of an international body into the territory of sovereign states. Distinguished mainly by the restrictions it set on the selection and access of inspectors, this document was a portent of problems that even now bedevil the applications of the Agency's safeguards under the NPT.

As supplier states' requests for the application of safeguards to material and equipment became more frequent, and the items supplied more sophisticated, the safeguards document had to be adapted. Over the years, the document was revised piecemeal, first to cover reactors of any size and later also other elements of the fuel cycle, including fuel fabrication and reprocessing.¹⁰

The resulting system, contained in document INFCIRC/66 and generally referred to by that symbol, was intended to assure that supplied items were not used for military purposes. While its effects would spread with the growth of the number of facilities and of the amount of material to which it would pertain, it was not initially conceived with the idea of covering entire fuel cycles in a state, but rather to apply to individual items: facilities, installations and given lots of nuclear material. As soon as the NPT was opened for signature in 1968, the Secretariat began to work on appropriate adjustments of the existing system, but it soon became obvious that the new situation called for a new regime that would be not only effective, but economical and widely acceptable as well, and that the INFCIRC/66 system would no longer do.¹¹

A new approach had been presaged in the treaty itself, where the fifth paragraph of the Preamble and Article III, on safeguards, posited the 'principle of safeguarding effectively the flow of source and special fissionable materials by use of instruments and other techniques at certain strategic points'. This wording was inspired in particular by technological developments then going on especially in Germany, which were supposed to give a high level of assurance for relatively modest effort.¹² Thus, in order to minimize the intrusiveness of safeguards and the risk of industrial espionage—which at the time was a subject of great concern within the nuclear industry—and in hopes of making safeguards more economical to states and operators, in terms of money, time and labour, the treaty itself dictated a set of parameters for safeguards application. On that basis, an open-ended committee of the Board of Governors drew up a new safeguards system, focused on nuclear-material accounting and the verification of states' declarations on their holdings of such material and the use they were making of it. By the end of the millennium, agreements providing for safeguards incorporating these principles were in force with 128 states.¹³ Critics of the efficacy of the Agency's safeguards liked to dismiss the system as meaningless bookkeeping, but in and of itself it worked more or less as intended. Most of the discrepancies and anomalies in the determination of material quantities that almost inevitably arose in the course of various industrial operations could be satisfactorily explained and in virtually all the cases with which the Agency dealt it saw no reason to report that significant quantities of material were unaccounted for.

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The question was, of course, whether this system, which was inherently a set of procedures to check the validity of information provided by states, was capable of detecting cheating, such as, for instance, the introduction into the fuel cycle of undeclared nuclear material or the development of a second, undeclared fuel cycle. As we have seen, it was in fact unable to do so, for the safeguards regime based on the strict parameters referred to here also reflected some specific, and as we now see, largely misplaced assumptions. Citing from a range of political utterances: by joining the NPT states showed their good intentions and demonstrated that they found security in their non-nuclear status. This should give them the benefit of the doubt and it would be logical that the verification procedure should be based on the state's own declarations—the state was innocent until the Agency proved it to be guilty or, in other words, the situation was as the state had said it was, unless the IAEA had reason to find otherwise. In retrospect, this should not be seen as just a matter of naive belief and hope. As stated before, at the time the system was introduced, international verification was a unique and novel political phenomenon, which many governments found hard to accept. So 'a soft and careful approach' was called for.¹⁴

The approach became too careful and soft and tended to erode the effect. An example is found in the subsidiary arrangements, a kind of executive arrangements that, under the model agreement, were to specify in advance how safeguards were to be applied in given situations and installations.¹⁵ Although the frequency of inspections was set in the model safeguards agreement, the figures given there became considered as the maximum and states demanded to be given figures for 'actual' frequencies, which found their way into the subsidiary arrangements. There they were further whittled down. States compared those frequencies and made sure that 'their' frequencies were no higher than anyone else's. In the end, the final number became the lowest common denominator among the various states. Similar things inevitably happened in regard to other elements of safeguards implementation and the Secretariat was not in a position to argue.

This had of course never been the intention of the ordinary folk in the Secretariat who had done so much work on the model agreement and the subsidiary arrangements. They had set out to design an objective system of oversight that would with a high degree of confidence catch the diversion of a given amount of nuclear material within a given time span. The difference between the attitude of the technical secretariat and those who had the political oversight is well illustrated in an exchange that took place when the safeguards system was being developed, between the Deputy Director General in charge of the safeguards department and a high-level delegation from an important industrial country. At one point in the conversation, the senior Agency official was asked why he needed so much information: didn't he trust the state? Which elicited the answer that if he was sure the state could be trusted, there was no need for safeguards. Not surprisingly, in that climate of political compromise, the man was promptly called to the Agency's Director General to account for his 'misplaced and irresponsible remark'.¹⁶

The discoveries made in Iraq in the early 1990s showed that the Deputy Director General's instincts had been right. They led, after thirty years of routine safeguards implementation to the adoption of a set of new and more intrusive ways of verifying the truth of the state's declarations, in the form of an 'Additional Protocol' to the standard safeguards agreement. That Additional Protocol is as yet far

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from generally accepted, and the break-outs from the regime that have become evident in the past few years have shown that the trust the international community was presumed to have was by no means always justified. We saw this in the Democratic People's Republic of Korea (DPRK) ten years ago, when the Agency found traces of undeclared plutonium production. The DPRK reacted to the disclosure of its bad faith by denouncing the treaty, which is hardly to be blamed on the Agency's safeguards. We see it also now in Iran, which appears to be engaged in several uranium-

enrichment processes of which it had not initially notified the Agency, and which, even now that the international community has pressured it into accepting the Additional Protocol, it may not have stopped altogether.

We recognize that the proliferation world in which we find ourselves is more dangerous than our optimism had led us to expect. But if the belief in the overall regime is waning it is not the safeguards system that is at fault. Safeguards, if applied properly and supported by *honest* intelligence, *objectively* analysed, can work as they are supposed to do: serve as a reliable confidence-building instrument and a means of warning if something is amiss. We have seen this in Iraq, where an international verification system during the 1990s, using elements of IAEA safeguards and operated by its staff, has turned out to be more effective than the intelligence apparatus of the world's most powerful nation;¹⁷ and we have seen it in Iran, where the IAEA seems to have unearthed information that American intelligence had not found.¹⁸

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The non-proliferation regime is facing a crisis. The dwindling belief in the promises of the NPT can only detract also from states' trust in the Agency's safeguards and reduce their continuing willingness to submit to a meaningful safeguards regime. Common sense demands that states should be aware of the security rewards they derive from continuing participation in that regime and from helping to strengthen it wherever possible. It is in the interest of the entire world community to keep that knowledge alive.

Notes

1. As it is an often-told story, one finds many useful references. The most authoritative of these (and the least entertaining) is *The United Nations and Disarmament 1945–1970*, United Nations Publication 70.IX.1, which is particularly informative on early events in the UN framework (pp. 11–24) and on the events leading up to the conclusion of the NPT, pp. 257–306. Brief lucid overviews may be found in D. Fischer, 1997, *History of the International Atomic Energy Agency—The First Forty Years*, Vienna, IAEA, pp. 15–28 and in J. Goldblat, 1982, *Agreements for Arms Control—A Critical Survey*, London, Taylor & Francis, pp. 12–15. See also P.C. Szasz, 1970, *The Law and Practices of the International Atomic Energy Agency*, Vienna, IAEA Legal Series No. 1, pp. 11–19. As for the term 'safeguards', this appears to have been used in this context for the first time in a 'Three Nation Agreed Declaration on Atomic Energy' of 15 November 1945, by the Prime Ministers of Canada and the United Kingdom and the President of the United States.
2. Resolution 1 (I) of 26 January 1946, which inter alia created the United Nations Atomic Energy Commission (UNAEC) with the task of making specific proposals for the elimination from national armaments of atomic weapons (and all other major weapons of mass destruction).
3. The phrase appears in the report of a committee established by United States Secretary of State Byrnes and chaired by Dean Acheson and David E. Lillienthal, the so-called Acheson-Lillienthal report, which formed the basis of the Baruch Plan. See United States, *The International Control of Atomic Energy*, 16 March 1946, Publication 2498, United States Government Printing Office.
4. The rationale for the establishment of the International Atomic Energy Agency and the early history of the nature and development of the Agency's safeguards are brilliantly described in the books of P.C. Szasz and D. Fischer, *op. cit.* Both books have benefited from their authors' personal experience of the substance they deal with.
5. This oft-forgotten fact might well be cited in response to allegations, voiced regularly both in the IAEA and at NPT review conferences, that the organization's budget is unfairly slanted towards its safeguards function, at the expense of technical assistance. According to Szasz, safeguards is '... perhaps even the uniquely important function without which the organization need not and possibly would not have been created'. See Szasz, *op. cit.*, p. 531.
6. The French Dimona reactor in Israel was ostensibly supplied for peaceful purposes but I have heard from a senior Israeli official instrumental in that deal that Israel intended to use it for the production of weapon-grade plutonium from the start. This is confirmed in the brilliant expose of this issue in A. Cohen, 1998, *Israel and the Bomb*, Columbia University Press.
7. Fischer asserts on the contrary that most bilateral partners of the United States at first objected to the transfer of the safeguards function to the IAEA, but were persuaded by Washington to accept the new situation (Fischer, *op. cit.*,

- p. 250). In the course of negotiating on a series of these so-called 'safeguards transfer agreements' I became convinced of the opposite, namely that, although most of the governments in question were not unhappy with American safeguards, they generally preferred the principle of international safeguards, presumably because this avoided a possible image of subservience. The facility operators, however, presented a different case; many of them initially expressed a preference for the continuation of American safeguards, if only because they knew the inspectors and were confident of their ability and discretion. Aware of this attitude, incidentally, Agency inspectors have generally tried to gain operators' confidence and maintain good working relations with them. This approach has caused some critics to pillory the IAEA for what they see as an overly cooperative approach in the way the IAEA has applied safeguards and even of an ethic of carelessness to possible diversion of nuclear material.
8. Statute of the IAEA, Art. III, 5, italics mine. I have heard that Myron Kratzer, the head of the American delegation to the negotiations on the Statute, called for the inclusion of this clause as a kind of 'afterthought'. Without it, the Agency would have lacked the authority for most for the application of safeguards under the NPT. See also Szasz, *op. cit.*, p. 536.
 9. In the mid-1960s, reputedly as a result of the discovery that China had been using its nuclear assistance for military purposes, the attitude of the Soviet Union to safeguards underwent a drastic change. In 1968, at the occasion of the Conference of the Non-Nuclear-Weapons States, which was held in Geneva to discuss the newly minted NPT, the head of the (observer) delegation of the Soviet Union, Prof. Emelyanov (who was his country's member of the Agency's Board of Governors) presented me, as the IAEA representative, to Ambassador Rozchin, head of the Soviet delegation to the Eighteen Nation Disarmament Conference, which had produced the treaty. Memorably, Emelyanov introduced me with words to the effect that I was one of those clever Agency people who, against the wishes of the Soviet Union, had so felicitously insisted on developing the IAEA's safeguards system, without which the NPT would hardly have been feasible.
 10. The final product, which is still applied to some facilities in states that are not subject to safeguards on all their nuclear activities, such as India, Israel and Pakistan, became known as INFCIRC/66. The term subsumes the document of 1965, covering reactors, and the two revisions: INCIRC/66 Rev.1 of 1966 and Rev.2 of 1968. See < www.iaea.org/Publications/Documents/Infcircs/Others/inf66r2.shtml >.
 11. See B. Sanders, 1975, *Safeguards Against Nuclear Proliferation*, Cambridge, MA and London, MIT Press, p. 6.
 12. Some of the instruments referred to in the Preamble to the treaty were developed at the Nuclear Research Centre of Karlsruhe, Federal Republic of Germany, and highly publicized by the latter not only as a means of simplifying safeguards and helping to assure their effectiveness, but also as potentially lucrative export items. A problem with some of these devices, however, was their cost and size, which was never fully solved and which made them unsuitable for use by the IAEA. This also made the system of material management that Karlsruhe had elaborated, and which assumed the presence of such equipment, less readily applicable.
 13. IAEA, *IAEA Annual Report 2000*, GC(45)/4, at < www.iaea.org/Publications/Reports/Anrep2000/index.html >.
 14. An illustration from personal experience: I once asked a senior American official how Agency inspectors should react if they were told that a particular facility where they had been supposed to verify the nuclear material inventory was being decommissioned and no longer contained relevant material: should they not make sure that this was indeed the case? The answer was no, the state's word was to be accepted. If possible, for instance if it was a small storage facility, the plant might be sealed; if not, the matter would end there. On another occasion, my informal request to look into a decommissioned research reactor that was being used for storage of non-nuclear items and was no longer on the state's inventory earned me a reprimand from Headquarters.
 15. 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* (also known as the model comprehensive safeguards agreement), IAEA document INFCIRC/153 of June 1972, para. 39, at < www.iaea.org/Publications/Documents/Infcircs/Others/inf153.shtml >.
 16. Direct information.
 17. Before its invasion of Iraq in 2003 and to have a convincing pretext for that event, the American Administration made every effort to find proof that Iraq had resumed its attempts to manufacture nuclear weapons. Statements at the highest level of the Agency that there was no evidence or plausible indication to that effect were jeeringly dismissed by members of the Administration, particularly its Vice President and senior officials of the Department of Defense. It would have been courteous if, after Dr David Kay, the head of the American investigation into the presence of weapons of mass destruction in Iraq, had publicly come to the same conclusion, not only with regard to nuclear but also to chemical and biological weapons, the Administration had apologized to the Agency for its unfair treatment. See H. Blix, 2004, *Disarming Iraq*, New York, Pantheon Books, in particular pp. 234-36.
 18. *New York Times*, 23 May and 2 June 2004. The case of Libya also deserves a brief comment. Reportedly, that country (like Iran and Iraq a party to the NPT) was found to have tried to use clandestine imports of technology, nuclear material and equipment to acquire a uranium-enrichment capacity, but since that discovery the IAEA has found that it was still quite far from reaching that stage. Apparently found out through the interception of a shipment

of telltale machine parts, Libya has now adopted an Additional Protocol to its comprehensive safeguards agreement. It is a fair bet that, if the Protocol had been in place earlier, the IAEA's safeguards would have been able to discover the clandestine programme by its own means.