

Strengthening safeguards in states with limited nuclear activities

Traditionally, the International Atomic Energy Agency (IAEA)'s verification system has concentrated chiefly on the scenario of diversion of declared nuclear material from known facilities in approximately 70 states, and on the timely detection of such diversion.

However, the Iraq experience prompted the IAEA to adopt a series of strengthening measures designed to improve the chances of the safeguards system detecting any undeclared nuclear material and activities in breach of safeguards agreements. As part of this process, the IAEA Board of Governors approved the Model Additional Protocol in May 1997, primarily to provide the Agency with better tools to verify the absence of such undeclared material and activities.

Nevertheless, notwithstanding these strengthening measures, the Agency's verification capability has remained limited in a significant number of states with Comprehensive Safeguards Agreements (CSAs) but without known nuclear facilities. This situation was brought about because of another, lesser-known protocol to safeguards agreements commonly referred to as the Small Quantities Protocol (SQP).

Available since 1971 to states with no or only limited nuclear activities, the SQP was designed to keep verification costs down and to make safeguards attractive to such states by holding in abeyance the implementation of most of the safeguards measures contained in CSAs.

States with SQPs were not required to report their nuclear material as long as their quantities of such material remained below certain limits¹ and the state did not have any nuclear material in a facility.² Moreover, the IAEA generally did not conduct any inspections in SQP states—not even to verify that the state qualified, or continued to qualify, for an SQP. Consequently, SQPs had the effect of limiting IAEA access to information on nuclear material and facilities.

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2006: the year in review

VERTIC turned 20 in 2006, and fittingly, we were busier than ever furthering the cause of verification—speaking at seminars and workshops around the world, redesigning the website and, as always, publishing articles, chapters and reports in our own products and those of our non-governmental and international organization colleagues. This issue provides a summary of what we did, what we published, who joined or left the centre, who supported our work with grants and commissions, and what the media asked us over the course of the past year. It also contains an examination of the international nuclear safeguards regime by Jan Lodding and Bernardo Ribeiro and an assessment of reporting under multilateral environmental agreements by Oliver Dambock. Finally, there are the regular features: Verification Watch, Science and Technology Scan, VERTIC News and Events and Verification Quotes.

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Development of a modified SQP

For the IAEA Secretariat, the limited information basis for drawing safeguards conclusions for states with SQPs became increasingly evident in recent years. This shortcoming was first brought to the attention of the IAEA Board of Governors in 2004, and in 2005 extensive consultations took place on the best way to remedy it. Some states felt that the SQP should be abolished so that safeguards could be implemented equally in all states with CSAs, while others believed that simplified procedures should continue to be implemented in SQP states—many of which are developing countries.

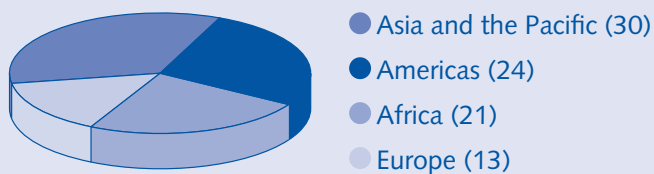
In September 2005, the Secretariat organized a ‘Seminar on the Strengthening of the Application of Safeguards in States with Small Quantities Protocols’ to facilitate the Board’s consideration of the issue. Later that month, the Board arrived at a number of decisions on the SQP. In particular, it opted to retain the SQP as part of the IAEA’s safeguards system, but to subject it to certain modifications that would require states to submit initial reports on nuclear material, inform the Agency immediately of any decision to build a nuclear installation and allow for IAEA inspections. The Board also decided that SQPs would no longer be available to states with a planned or existing nuclear facility.

Box 1

More than 100 states qualify for SQPs

As of 1 February 2007, 88 states have safeguards agreements with SQPs in force.³ As illustrated in Figure 1, these states come from almost all regions of the world. The large number of SQP states in Asia and the Pacific and in Latin America and the Caribbean is due in part to the prevalence of many Small Island States in those areas.

Figure 1 **SQP states, by region**



Furthermore, it is thought that the overwhelming majority of the 30 states that have not yet met their requirement under Article III of the Nuclear Non-Proliferation Treaty (NPT) to bring into force a CSA with the IAEA are eligible for an SQP. Of these, one-third has signed a CSA with an SQP or has had such an agreement approved by the IAEA Board of Governors.

With regard to states that already had an SQP, the Board authorized the Director General to give effect to the modifications to the SQP and the changed eligibility criteria by concluding exchanges of letters with the concerned states. Additional states wishing to conclude safeguards agreements with SQPs would have to sign the modified text.

Consequences of the IAEA Board's decisions

An issue that was subject to much consultation in the run-up to the Board’s decisions concerned the practical ramifications of the SQP modification for the IAEA and the states concerned.

According to the Secretariat’s assessment, the existing safeguards budget could absorb the cost of the Agency’s additional work—concluding exchanges of letters, processing reports, conducting some limited inspection activities to verify state declarations and so on. The impact on the states, meanwhile, would depend on the existing level of national controls on nuclear material and activities.

Having accepted the modified SQP text, states need to submit an initial report on nuclear material—a provision that was suspended by the 1971 SQP text.⁴ For some SQP states, this will be a matter of confirming the absence of nuclear material or facilities, but others will need to declare limited amounts of nuclear material, ranging from depleted uranium used for shielding in hospitals or in drilling operations to gram quantities of enriched uranium or plutonium.⁵ In such cases, state authorities would also need to facilitate the conduct of inspections, if the IAEA requests such access to verify the inventory.⁶

A small number of states with planned or existing nuclear facilities will need to rescind their SQPs pursuant to the new eligibility criteria. For seven of these states, this will have no practical impact, as SQPs have already been suspended because they are operating nuclear facilities.

The SQP and the Model Additional Protocol

Additional Protocols, while filling many gaps in the safeguards system, could not fully substitute for the information and access rights held in abeyance by the 1971 SQP. In fact, the Model Additional Protocol, in some ways, starts from the assumption that a state is already providing all of the information required under the CSA. For instance, while states with an Additional Protocol provide the IAEA with information about the whereabouts of small quantities of nuclear material, states with the ‘old’ SQP are not required to report on the types and quantities of any such material. Nor does the Additional

Box 2

State System of Accounting for and Control of Nuclear Material (SSAC)

Each state with a CSA, even if it has an SQP, is required to maintain an SSAC to keep track of nuclear material and activities on its territory. For states with SSACs already in place, the information to be provided to the IAEA should be readily available to the state. However, in the Secretariat's experience, many SQP states still need to establish such national nuclear control systems. In most cases, it should be sufficient to designate an official or unit as the national safeguards counterpart, and provide it with the necessary authority to collect the required information. States that are already providing some information to the IAEA pursuant to CSAs and Additional Protocols could be expected to have these systems already in place, and would therefore likely be well prepared to implement the modified SQPs.

Protocol address the issue of early design information. States with the 1971 SQP are not required to report new facilities until six months before the introduction of nuclear material.

Currently, 27 SQP states have Additional Protocols. For seven of these, the IAEA has carried out enough evaluations to conclude, for 2005, that all nuclear material in the states remained in peaceful activities.⁷ Notwithstanding the modification of SQPs, the full implementation of all Additional Protocol measures will remain indispensable for the IAEA to be able to draw safeguards conclusions on the absence of undeclared nuclear material and activities.

The effects of the modification of the SQP go beyond the implementation of safeguards. By requiring each state to account for any nuclear material and activities, the modified SQP helps states improve national controls on such material and activities and thus prevent clandestine nuclear activities involving non-state actors. This is also an underlying objective of United Nations (UN) Security Council resolutions 1540 (2004) and 1673 (2006). In particular, the conclusion and implementation of an Additional Protocol—which requires all parties (including SQP states) to monitor transfers of specified equipment and non-nuclear material⁸—could be seen as a tangible contribution to the objectives of these resolutions, and to the interdiction of illicit trafficking.⁹

IAEA assistance to SQP states

As part of its decisions on SQPs, the Board of Governors asked the Secretariat to assist SQP states, including non-members

of the IAEA, using available resources, with establishing and maintaining SSACs. In line with this decision, the IAEA is helping states to understand the implications of the SQP modification.

In addition to issuing new information material outlining the limited reporting requirements that apply to SQP states, the Secretariat has organized a number of outreach and training events adapted to meet the special situation of such states. In February 2006, at an inter-regional seminar in Vienna, Austria, some 70 participants from more than 40 states with SQPs (including five non-members of the IAEA) were briefed about the policy, legal and technical aspects of the Agency's safeguards system. Furthermore, hands-on training was provided on how to fill out reports and declarations pursuant to CSAs and Additional Protocols. Similar training was given to representatives of SQP states who attended regional seminars in Morocco (October 2005), Ecuador (April 2006) and Australia (July 2006). To date, some 190 representatives from more than 80 states with SQPs or believed to qualify for one have received training since the Board took its decision to modify the SQP. The IAEA intends to continue offering SSAC training to SQP states in coming years.

Such events are in very high demand among officials from SQP states wishing to comprehend the various dimensions of IAEA safeguards. For the IAEA, they are a useful opportunity to explain what is required for implementing strengthened safeguards, while indicating the type of policy, technical, administrative or legal obstacles that states are facing in the process of amending their SQPs. In conducting such events, the IAEA seeks to ensure that states are provided with sufficient information to enable them to present it with accurate, punctual reports. At the same time, it is important not to overwhelm states with information or to give the impression that implementation of strengthened safeguards will place an undue burden on them.

Conclusion

The IAEA Secretariat is in the process of giving effect to the modified SQP by concluding exchanges of letters with all states with SQPs in force. As of 1 February 2007, 10 states have agreed to the modifications, while two additional states—which do not yet have CSAs in force—have agreed to sign the modified text and one has rescinded its SQP. Completing such exchanges of letters can be a lengthy process. However, the IAEA is hoping that SQP states will complete the necessary actions as a matter of priority.

Ultimately, the modified SQP will have the effect of strengthening the IAEA safeguards system as well as global nuclear security. The process leading to the modification demonstrates that in the right circumstances, the Agency is able to adapt to changing conditions and expectations with regard to the extent of the non-proliferation assurances that the safeguards system provides. Unlike the Additional Protocol and recent measures to deal with covert nuclear trade networks, the amendment of the SQP was not triggered by any state-specific verification experience, but rather by the realization that the technical basis for drawing safeguards conclusions for SQP states needed to be improved. Increased transparency and confidence in states' peaceful nuclear activities, in turn, will continue to facilitate international cooperation involving nuclear material and related technologies in future years, and foster the IAEA's fundamental objectives of peace and development.

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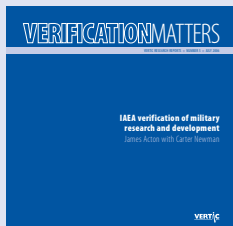
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Endnotes

- 1 Nuclear material below the threshold set in paragraph 37 of INFCIRC/153, that is: one kilogram in total of special fissionable material; 10 metric tons in total of natural uranium and depleted uranium (DU) with an enrichment above 0.5%; 20 metric tons of DU with an enrichment of 0.5% or less; and 20 metric tons of thorium. Irrespective of these amounts, all states with SQPs need to report imports and exports of nuclear material.
- 2 States with SQPs could retain undeclared facilities as long as these did not contain any nuclear material.
- 3 For eight of these states, SQPs are not operational.
- 4 Under the modified SQP, some provisions of CSAs, such as the obligation to keep detailed accounting records, continue to be held in abeyance, and preparation of subsidiary arrangements, detailing implementation procedures for the state, remains voluntary.
- 5 Once reported, states may request the exemption of nuclear material in accordance with their safeguards agreements.
- 6 The amended SQPs provide for *ad hoc* and special inspections while routine inspections continue to be suspended.
- 7 The safeguards statement for 2005, background to the statement and the executive summary are available at www.iaea.org/OurWork/SV/Safeguards/es2005.html.
- 8 The state is required to report on exports of such items, and to confirm imports on request by the IAEA.
- 9 The Asia-Pacific Economic Cooperation (APEC) forum declared, in a 2004 ministerial statement, that for its members, the determination to conclude Additional Protocols with the IAEA reflects their determination not to allow illicit nuclear activities in the region through a collective commitment to expanded transparency of nuclear-related activities.

James Acton and Carter Newman, 'IAEA verification of military research and development'

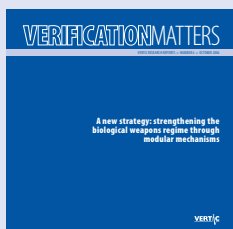
Verification Matters, No. 5, July 2006



This study examines what authority the IAEA has to look for instances of weaponization. In addition, it identifies a number of indicators that individually could point to the existence of a clandestine weaponization programme. These range from changes in the structure and behaviour of a country's scientific community to the acquisition of specific items of equipment and the presence of key marker substances in the effluent of suspect laboratories. The report also outlines the techniques that the Agency needs to detect these indicators, some of which are not currently at its disposal.

VERTIC, 'A new strategy: strengthening the biological weapons regime through modular mechanisms'

Verification Matters, No. 6, October 2006



This study details various mechanisms that could improve the implementation of the 1972 Biological Weapons Convention (BWC). It assesses the possible mandates as well as the responsibilities and requirements of the modular mechanisms that have been identified to strengthen the biological weapons regime. Seven modular mechanisms have been proposed, including the establishment of a national authority and contact points in each state party to oversee implementation of the treaty, and the creation of a scientific and technical advisers' network (STAN) to consider, review and communicate to states parties practical ways of addressing issues arising from scientific and technological developments that affect the

convention and its implementation.

Copies are available on VERTIC's website at www.vertic.org or contact Jane Awford, VERTIC's Information Officer and Networker, by e-mail at jane.awford@vertic.org.

Reporting under MEAs: exploring new approaches

Attempts by states to coordinate their efforts to tackle global environmental problems have led to the establishment of numerous multilateral environmental agreements (MEAs).¹ Monitoring, reporting, review, verification and compliance procedures are fundamental components of the MEA architecture. These procedures allow assessments to be made of individual and collective progress by states towards treaty goals and can provide information on which to base future objectives and priorities. They offer ways to promote and facilitate compliance and permit states parties to share experiences.

The combination of the large number of MEAs and the substantial quantity of information that they often demand has led to many states parties experiencing heavy reporting burdens. In addition, the reporting requirements can be complex. For example, states parties had to answer several hundred questions, some of which were not easy to understand, in preparing their third national report, due in 2005, to the 1992 Convention on Biological Diversity (CBD).² The reporting burden is particularly heavy for developing countries that lack institutional, financial and technical capacities to meet their reporting commitments.

For MEAs to be successful and to secure wide participation and compliance, they should be equitable and allocate both substantive (environmental targets) and procedural (monitoring and reporting) obligations in a balanced way. To this end, the principle of common but differentiated responsibility is often employed in MEAs. Fair and balanced structuring of procedural obligations can be achieved by making the volume, type or frequency of monitoring and reporting appropriate to a state's level of development and its capacity to monitor and report. Furthermore, technical and financial assistance can be provided to aid states' efforts. Of course, such measures should not only reduce the reporting burden on states but also aim to improve the accuracy, transparency and completeness of the information reported. The 1992 United Nations Framework Convention on Climate Change (UNFCCC) employs a variety of tools to facilitate states parties' monitoring and reporting. In 1999, for instance, it established a Consultative Group of Experts (CGE) to help developing country parties prepare their reports.

Many MEAs are concerned with different aspects of one broad theme, such as biodiversity or chemicals. Several initiatives have begun to explore the shared ground between agreements to determine whether opportunities exist to increase efficiency and effectiveness in tackling environmental problems. These opportunities may lie within the current international environmental governance structure (with an agreement maintaining its existing mandate) or they may be built into a fundamentally different international environmental governance structure.³

One initiative that has explored such opportunities within the current environmental governance structure is the United Nations Environment Programme/World Conservation Monitoring Centre (UNEP-WCMC) project that investigated the possibilities of harmonizing information management and reporting for biodiversity-related treaties. The project aimed to improve treaty implementation by examining, in particular, how secretariats could make the reporting system more efficient and effective and reduce the reporting burden on states parties by streamlining national reporting. This article provides an overview of the project.⁴

Initiatives to harmonize and streamline reporting

In 1998, UNEP and biodiversity-related treaty secretariats commissioned the WCMC to undertake a feasibility study on harmonizing information management infrastructure for biodiversity treaties within the scope of their existing mandates. In October 2000, UNEP convened a workshop entitled 'Towards the harmonization of national reporting to biodiversity-related treaties' to evaluate the potential benefits and pitfalls associated with harmonizing reporting processes. Held at the headquarters of the UNEP-WCMC in Cambridge, United Kingdom, it recommended setting up four pilot projects (in Ghana, Indonesia, Panama and the Seychelles) to consider in practice the consequences of harmonizing reporting in relation to five biodiversity-related treaties and to identify what lessons could be learned from these experiences (see Table 1). The treaties were the CBD, the 1973 Convention on International Trade in Endangered Species (CITES), the 1979 Con-

Table 1 **Pilot projects on MEA reporting**

Country	Project description	Project results
Ghana	Assessment of the possibility of linking national reporting to the State of the Environment (SoE) reporting process. ⁵	Identification of gaps in information relevant for reporting to treaties and preparing the SoE report. Model established to link national reporting under the treaties to the SoE reporting process.
Indonesia	Identification of common information modules across the treaties and their employment as a basis for developing a modular approach to national reporting. Under this approach, the information required for reporting on treaty implementation is categorized into a series of discrete packages or themes. The relevant national agencies and focal points then maintain the packages or themes and provide them to whichever reports need them.	Identification of the potential to group national reporting information for the different biodiversity treaties within a thematic modular framework. A modular approach is expected to ease the reporting burden and simplify the reporting process. However, the variety of formulations used by the treaties to request information and the frequency of reporting cycles impede a move towards modular reporting. The lack of harmonization at the international level is a key issue that needs to be resolved to facilitate a shift towards more harmonized national reporting.
Panama	Exploration of the potential of regional support mechanisms for national information management and reporting.	Identification of several areas where national improvements could be made and regional organizations could be of assistance.
Seychelles	Examination of the possibility of producing a consolidated national report that responds to the needs of several treaties.	Identification of barriers to the production of one consolidated report. It was suggested that the use of different packages of treaties might yield different results. The different reporting cycles of the treaties proved a major impediment to streamlining efforts. Nevertheless, a single reporting process was seen as a way of partially reducing the reporting burden. The consolidated report concept, which could satisfy the needs of several treaties, might usefully be tested on more closely related treaties.

Source: UNEP-WCMC, 'Harmonization of Information Management and Reporting for Biodiversity-related Treaties. Final Report on UNEP Pilot Projects', 2004, www.unep-wcmc.org/conventions/harmonization/workshop04/Summary_pilot_%20projects.pdf.

vention on Migratory Species (CMS), the 1972 World Heritage Convention and the 1971 Ramsar Convention on Wetlands.⁶

A follow-up workshop was convened in 2004 in Haasrode, Belgium, to consolidate the work of the pilot projects. The workshop drew the following conclusions (the results are not mutually exclusive):⁷

- National reporting can be linked to the State of the Environment reporting process.
- A modular reporting system is viable and would reduce reporting burdens. However, a number of external constraints and resource issues need to be addressed to allow successful implementation of the modular approach.

- Regional support should be provided for national information management efforts.
- The submission of one single report that serves the requirements of all biodiversity-related treaties presents difficulties, but joint thematic reports for several treaties could be beneficial.

The project findings can be divided into a series of recommendations for improving reporting systems at the international level and guidelines for the national level. These are based on conclusions and recommendations from the pilot projects and subsequent discussions among stakeholders.⁸ At the international level, opportunities to coordinate work among MEAs include:

- synchronizing MEA reporting cycles;
- harmonizing MEA reporting formats;
- developing a consolidated reporting manual;
- implementing joint programmes of work;
- expanding reporting initiatives to other MEAs;
- using national reporting formats as a national planning tool;
- testing different approaches to harmonization of reporting;
- increasing the availability of reports on the internet;
- sharing terminologies;
- assessing linkages to global monitoring processes;
- examining connections to the Millennium Development Goals;
- supporting developing countries in their efforts; and
- establishing online reporting mechanisms.

At the national level, guidelines include:

- reviewing relevant institutional and administrative arrangements;
- establishing a national coordination mechanism;
- setting up a national biodiversity database/clearing house;
- providing information technology (IT) facilities and training;
- creating an operational framework for biodiversity stakeholder interaction; and
- incorporating indicators of treaty implementation into biodiversity projects.

A three-step process has been devised that could enhance national information management. First, states identify the information that they need to fulfil their reporting obligations. Second, they evaluate the most effective way of managing the information, such as through a consolidated database. Third, they establish the necessary institutional arrangements, including liaison between information managers and convention focal points.⁹

Focus of reporting: process versus results

Most of the current reporting systems focus on processes and national legal implementation measures undertaken by states to satisfy treaty obligations rather than on actual environmental benefits. Governing bodies are increasingly calling for better information on results to enable them to assess effectively the impact of implementation activities. However, the reporting burden could be heightened if, in attempting to redress the balance between processes and outcomes in reports, questions concerning outcomes are bolted on to existing reporting requirements. This situation could be avoided by altering the

reporting system in two stages: first, by integrating harmonization and streamlining features into existing reporting systems, which would lessen the overall amount of reporting with regard to a given set of related environmental agreements; and second, by incorporating information on outcomes into national reports. This would entail a requirement that states answer additional questions and should be accompanied by a substantial reduction in the amount of requested information on processes.¹⁰

Implementation of results and follow-up activities

Many of the recommendations from the UNEP pilot projects have yet to be integrated into the relevant MEAs or national information management systems. However, work in this area is progressing. Follow-up activities have included a report that reviews the national reporting systems of the five biodiversity-related treaties and potential overlaps among them in relation to information requests. The report found that both the clarity of demands for information and the degree to which secretariats use the information vary across the treaties. While most of the reporting requirements are specific to each treaty, some thematic commonalities have been identified. For example, the 2010 target of achieving a significant reduction in the rate of biodiversity loss could serve as a starting point for establishing common reporting requirements.¹¹

In November 2006, a new UNEP project on knowledge management among biodiversity treaties got under way. The project, which UNEP-WCMC is implementing in cooperation with biodiversity-related convention and agreement secretariats, is the result of a series of meetings on knowledge management held in Cambridge in June 2006.¹² Among other things, the project addresses a number of aspects of harmonization of reporting, building on the results of the UNEP pilot projects and the 2004 workshop.

The project will identify a set of joint core reporting elements across MEAs. The reporting process for human rights conventions informs this approach. Under the latter, states are required to produce a core report that meets the reporting requirements of the entire array of human rights conventions, while specific reports address aspects of each treaty that are not common to other conventions.¹³ The UNEP project also aims to draft, for the first time in the MEA sphere, joint reporting formats for particular themes shared by two or more conventions (inland water biodiversity, dry land biodiversity and migratory species).

22 May 2007 International Day for Biodiversity

The Secretariat of the 1992 Convention on Biological Diversity (CBD) has announced that the focus of the 2007 International Day for Biological Diversity (IBD) will be on Biodiversity and Climate Change. Further information on the links between these issues and to access the Secretariat's Clearing-House Mechanism—which seeks to support the Convention's thematic and cross-cutting programmes of work by promoting cooperation, exchanging information and developing a network of partners—visit the Convention's website at www.biodiv.org.

Conclusion

How to improve the effectiveness, efficiency and coherence of the international environmental governance system has been the subject of wide-ranging international discussions in a variety of forums as well as the focus of an assortment of initiatives. Ongoing UNEP projects contribute to this debate by exploring opportunities to harmonize information management and reporting to biodiversity-related MEAs.

Harmonization of information management and reporting will require additional efforts in the short term. In the long run, though, such activities may yield significant benefits. Results from the UNEP projects on harmonization of information management and reporting to biodiversity-related MEAs indicate that these activities may have the potential to reduce the reporting burden on states parties and increase efficiency and effectiveness in the reporting process.¹⁴

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Endnotes

- 1 The author would like to thank Peter Herkenrath and Larry MacFaul for their comments on and assistance with this article.
- 2 Peter Herkenrath, 'Options for harmonizing national reporting to biodiversity-related treaties', 2005a, www.unep-wcmc.org/conventions/harmonization/options_for_harmonizing_national_reporting.pdf.
- 3 For a discussion on improving the international environmental governance system, see Andreas Rechkemmer (ed.), 'UNEO – Towards an International Environment Organization', Nomos, Baden-Baden, 2005. International processes dealing with the issue of enhancing international environmental governance include the United Nations Environmental Programme (UNEP)'s Governing Council/Global Ministerial Environment Forum (GC/GMEF); see proceedings of the GC/GMEF sessions at www.unep.org/resources/gov/overview.asp. For a summary of discussions on the issue at the 24th session of the GC/GMEF in February 2007, see 'Summary of the 24th Session of the UNEP Governing Council/Global Ministerial Environment Forum', 5–7 February, *Earth Negotiations Bulletin*, International Institute for Sustainable Development (IISD), vol. 16, no. 60, 12 February 2007, www.iisd.ca/vol16/enb1660e.html and 'UNEP Governing Council Addresses Globalization and UN Reform, Establishes Working Group on Mercury' and 'Side Event and Conferences Contribute to GC-24/GMEF', *MEA Bulletin*, no. 21, 15 February 2007, www.iisd.ca/mea-l/meabulletin21.pdf. For a summary of UN General Assembly (UNGA) consultations on international environmental governance, see 'UNGA Consultations Address MEA Compliance, Summary Report', *MEA Bulletin*, no. 9, 6 July 2006, www.iisd.ca/mea-l/meabulletin9.pdf.
- 4 The Environmental Management Group (EMG) has also reviewed harmonization of reporting issues. The EMG was established in 2001 to serve as a forum for discussion among specialized agencies, programmes and organizations. At its first session in 2001, an Issue Management Group (IMG) was created to address harmonization of national reporting for biodiversity-related conventions. The IMG brought together representatives of the different biodiversity treaties and agencies to exchange information and views. While the EMG has allowed a high-level exchange of views to take place and some agreement has been reached, its contribution to harmonization activities has been limited since cooperation among participants has been hampered by their differing agendas. Source: personal communication with Peter Herkenrath (UNEP-WCMC), 28 March 2006. See also the EMG website at www.unemg.org.
- 5 For information on the SoE reporting process, see 'A report on the national reporting mechanisms (institutional frameworks and information flow) for the Biodiversity-related Conventions and State of the Environment', December 2003, www.unep-wcmc.org/conventions/harmonization/products/FinalGhana.doc.
- 6 Herkenrath, 2005a.
- 7 UNEP-WCMC, 'Harmonization of Information Management and Reporting for Biodiversity-related Treaties. Final Report on UNEP Pilot Projects', 2004, www.unep-wcmc.org/conventions/harmonization/workshop04/Summary_pilot_%20projects.pdf.
- 8 UNEP-WCMC, 'Towards the harmonization of national reporting to biodiversity-related treaties. Workshop report', 2004, www.unep-wcmc.org/conventions/harmonization/workshop04/Workshop_report.pdf.
- 9 Herkenrath, 2005a.
- 10 Herkenrath, 2005a.
- 11 Peter Herkenrath, 'A review of the national reporting systems of the five global biodiversity-related conventions', UNEP-WCMC, Cambridge, 2005b.
- 12 See Lynn Wagner, 'Briefing Note for Three Workshops on Knowledge Management for Multilateral Environmental Agreements', www.iisd.ca/mea-l/briefing8.html.
- 13 See www.ohchr.org/english/bodies/treaty/CCD.htm.
- 14 Herkenrath, 2005a; personal communication with Peter Herkenrath of UNEP-WCMC, 28 March 2006.



'Committee 25' meets again

The Advisory Committee on Safeguards and Verification within the Framework of the IAEA Statute of the IAEA met in Vienna from 13–14 February 2007 to discuss measures to strengthen the Agency's safeguards system. The committee first met in November 2005, however little information has been made public on any progress made. All documents produced through the process are restricted: not even information on the topics addressed by the committee has been released.

The IAEA Board of Governors established 'Committee 25', as it is referred to within the Agency, on 17 June 2005. Its task was 'to consider ways and means to strengthen the safeguards system' and to report its findings to the Board. It was given a two-year mandate, which expires in June 2007. The IAEA Secretariat has introduced a number of discussion papers to facilitate the process, including on how to enhance the Agency's satellite imagery capacity and how to upgrade the organization's laboratory in Seibersdorf, Austria.

In June 2005, IAEA Director General Dr Mohamed ElBaradei suggested to the Board of Governors that 'Committee 25' could look at ways to: improve information sharing; integrate emerging technologies; enhance the Agency's independent analytical capabilities; and ensure that the IAEA has adequate and uniform legal authority to conduct credible verification.

At a cost of approximately €89,000 per day, Committee 25 met on: 11–12 November 2005; 17–18 January 2006; 8–9 May 2006; 26–27 September 2006; and 13–14 February 2007.

One could reasonably expect the committee's deliberations to have produced tangible results over a 20-month period. Yet sources within the IAEA indicate that there is still no clear programme of work. Germany's proposal—to use the Secretariat's recommendations as a provisional work programme—has not been adopted, possibly because some member states contend that they lack balance and, specifically, insufficiently reflect the obligations of the nuclear weapon states.

In an attempt to invigorate the process, the committee's Algerian chairperson, Taous Ferouki, held informal consultations with other members in June 2006, and the Secretariat compiled a set of 18 recommendations (relating to legal obligations, voluntary actions and technical capabilities) for

consideration by the committee at its September 2006 meeting. This gave rise to further difficulties, though, as while the committee agreed to continue its discussions, some states expressed concern that voluntary measures may come to be interpreted as legal obligations. This is roughly the state of play as of February 2007.

It remains to be seen if the work of this committee will improve the Agency's safeguards system. With no work programme agreed, and only limited work completed, the committee's two-year mandate will likely have to be extended beyond June for it to deliver any substantial products.

Sources: Mohamed ElBaradei, 'Introductory Statement to the Board of Governors', 14 June 2005, www.iaea.org; IAEA, 'Safeguards Statement 2005', www.iaea.org; Mohamed ElBaradei, 'Statement to the Fiftieth Regular Session of the IAEA General Conference 2006', 18 September 2006, www.iaea.org; IAEA General Conference, 'Strengthening the effectiveness and improving the efficiency of the safeguards system and application of the Model Additional Protocol', GC(50)/2, 7 August 2006, www.iaea.org; IAEA General Conference, 'The Agency's Budget Update for 2007', GC(50)/6, July 2006, www.iaea.org; personal communication with officials associated with the IAEA.

Central Asia nuclear weapon-free zone treaty signed . . . at last

On 8 September 2006, the foreign ministers of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan met in Semipalatinsk, Kazakhstan, to sign the Central Asia Nuclear Weapon-Free Zone Treaty. The text was agreed in September 2002, although certain sticking points delayed its adoption (see *Trust & Verify*, no. 105). Difficult issues relate to provisions that permit the transiting of nuclear weapons through the zone, the desire of the Central Asian republics to secure negative security assurances from the nuclear weapon states, and the potential conflict between the treaty's requirements and other agreements. The Central Asian countries decided to proceed with signing the treaty despite not having resolved all of these matters.

The adoption of this nuclear weapon-free zone, comprising more than 3.9 million square kilometres, is noteworthy as all five signatory states formerly possessed or notionally controlled nuclear weapons and are virtually surrounded by nuclear weapon states (India and Pakistan to the south, China to the east, and Russia to the north). Significantly, the treaty promotes

the idea that a Model Additional Protocol is the safeguards standard, by requiring all of its states parties to conclude such an agreement with the IAEA.

Source: Scott Parrish and William Potter, 'Central Asian States Establish Nuclear-Weapon-Free-Zone Despite U.S. Opposition', CNS Research Story, 5 September 2006, <http://cns.miis.edu>.

Frozen verification

The Antarctic tundra may seem an unlikely location for an on-site inspection, but during November and December 2006, the United States exercised its right as a consultative party to the 1959 Antarctic Treaty to do just that. The accord prohibits any military activity or deployment of weapons on the continent and, along with its three protocols on conservation and environmental protection in the area, forms part of the Antarctic Treaty System. Its verification system provides for unannounced on-site inspections, with a 'go anywhere, see anything'-style mandate, to be carried out among the 'consultative states parties'—countries that have been engaging in scientific activities via their own observation stations in Antarctica. While consultative parties have visited each other's facilities continuously since the 1950s, inspections are relatively rare. The 2006 US interagency inspection, involving officials from the Department of State, the Environmental Protection Agency and the National Science Foundation, sought to verify compliance with the 1959 treaty and its 1991 Protocol on Environmental Protection. The team inspected stations operated by Argentina, Chile, China, Germany, Russia and the UK, as well as vessels involved in scientific research and tourism. France, Italy, New Zealand and Sweden plan to form an inspection group in the near future.

Sources: Sveriges Radio, 'Sweden Initiates Antarctic Inspection', 10 January 2007, www.sr.se; US Department of State, 'U.S. Antarctic Treaty Inspection 2006', Bureau of Oceans and International Environmental and Scientific Affairs, 1 December 2006, www.state.gov.

North Korea to readmit IAEA inspectors?

The third session of the fifth round of the Six-Party Talks, aimed at denuclearizing the Korean Peninsula, took place in Beijing, China, from 8–13 February 2007. The result was a document outlining initial steps to implement the provisions of the September 2005 Joint Statement, also a product of the Six-Party Talks involving China, Japan, North Korea, South Korea, Russia and the US.

Under the latest accord, North Korea has agreed to shut down and seal its Yongbyon nuclear facility 'for the purpose of eventual abandonment' in return for foreign economic,

energy and humanitarian aid. This is contingent on the country inviting IAEA inspectors within 60 days to monitor and verify the process.

It is by no means a straightforward exercise: the IAEA has been unable to confirm or refute the existence of a clandestine weapons programme in North Korea since efforts began in 1993. North Korea has repeatedly contravened its previous 'freezes' on nuclear activity. References by the country's official news agency, the Korean Central News Agency, to the new deal as only a 'temporary suspension' serve as a caution to optimists on the possibility of it leading 'eventual abandonment'.

Sources: Chinese Foreign Ministry, 'Initial Actions for the Implementation of the Joint Statement', press release, 13 February 2007, www.fmprc.gov.cn; 'Joint Statement of the Fourth Round of the Six-Party Talks', www.state.gov; IAEA, 'Fact Sheet on DPRK Nuclear Safeguards', www.iaea.org; Xinhua, 'Six-Party Talks End with Joint Document', press release, 13 February 2007, www.chinaview.cn.

Fissban fizzles

On 18 May 2006, the US presented a draft Fissile Material Cut-off Treaty (FMCT) to the Conference on Disarmament (CD) in Geneva, Switzerland. The draft proposes a cut-off on the production of fissile material for use in any type of nuclear explosive and specifies that fissile material produced after that date cannot be employed in explosives. The text does not specify how material produced before the cut-off date should be treated, thus allowing a nuclear weapon state to dispose of its nuclear material in any way it sees fit.

Significantly, but unsurprisingly, the draft text proposes a compliance clarification procedure rather than a verification system. The paper suggests that all parties will rely on their own national means and methods to collect compliance-relevant information. The draft also advocates a two-step procedure for dealing with allegations of non-compliance. First, the alleging party must consult with the accused party. Second, after consultations, the alleging party may choose to ask a depositary to convene a conference of parties to discuss the matter, or it may bring the matter before the UN Security Council. If it pursues the latter option, the alleging state must produce evidence related to the matter. It was expected that the US draft would ignore multilateral verification—in 2004, the US abruptly reversed its long-standing support for an FMCT verification regime, claiming that such a treaty was unverifiable (see *Trust & Verify*, no. 116).

The US view that an FMCT cannot, or perhaps should not, be verified has come under serious challenge from various quarters. On 24 August 2006, for instance, the IAEA pre-

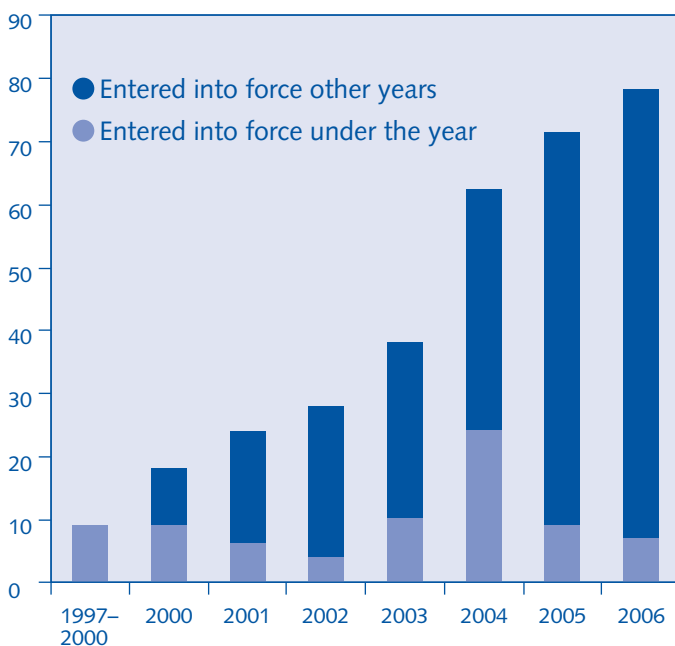
sented a paper to the CD that indicated how a similar system to the safeguards regime could be used to verify a FMCT. The paper also argued that the precise level of assurance that the regime could offer would depend on, among other factors, the scope of the treaty. This is a belief largely shared by the International Panel on Fissile Materials in its *Global Fissile Material Report 2006* and Bruno Pellaud in his paper on 'A Pragmatic Approach to Verification of a FMCT'.

Sources: US Department of State, 'US tables draft FMCT at Conference on Disarmament', press release, 18 May 2006, <http://geneva.usmission.gov>; Tariq Rauf, 'A cut-off of production of weapon-usable fissionable material: considerations, requirements and IAEA capabilities', IAEA Statement to the CD, 24 August 2006; International Panel on Fissile Materials, *Global Fissile Material Report 2006*, 27 September 2006, www.fissilematerials.org/ipfm/site_down/ipfmreport06.pdf; Bruno Pellaud, 'A Pragmatic Approach to Verification of a FMCT', CD/1771, 16 May 2006, www.reachingcriticalwill.org.

Fuelling the Agency

The fiftieth General Conference of the IAEA convened in Vienna from 18–22 September 2006. This is the organization's highest decision-making body, comprises all member states, and meets once a year. Its most important task is to consider and approve the Agency's programme and budget, but it also decides on other matters brought before it by the Board of Governors, the Director General or member states.

Figure 1
Entry into force of additional protocols, 1997–2006



Source: IAEA, 'Strengthened Safeguards System: Status of Additional Protocols', www.iaea.org.

Box 1

Additional Protocols in 2006

- **Approved by the Board of Governors:** Central African Republic, Dominican Republic, Kyrgyzstan, Malawi and the Republic of Moldova.
- **Signed:** Fiji, Liechtenstein and Senegal.
- **In force:** Fiji, Haiti, Libya, Slovenia, Turkmenistan, Uganda and Ukraine.

Source: IAEA, 'Strengthened Safeguards System: Status of Additional Protocols', www.iaea.org.

No significant changes were made to programme and budget proposals for 2006–07 (see *Trust & Verify*, no. 122), and it remains unclear how the Advisory Committee on Safeguards and Verification within the framework of the IAEA Statute will be funded (see "Committee 25' meets again" above). It was agreed last year that the costs of convening this committee (€89,000 per day) should not be met through the regular budget. As a result, the Secretariat identified the following three means of funding the committee: through extra-budgetary contributions to Subprogramme U.3 (Services for Policy-Making Organs), or through a supplementary appropriation financed either by additional assessed contributions from member states, or, with the Board's approval, using the 2004 cash surplus.

Total estimated expenditure for nuclear verification in 2007 remains at approximately €110 million.

Source: IAEA General Conference, 'The Agency's Budget update for 2007', GC(50)/6, July 2006, www.iaea.org.

1540 Committee: renewed and reaching out

On 25 April 2006, the UN Security Council Committee established pursuant to resolution 1540 (2004)—also known as the 1540 Committee—published a report summarizing UN member states' progress in adopting the required national implementing measures and providing reports on implementation to the committee. The report concluded that the status of national measures 'cannot be considered entirely satisfactory' and that there was a distinct 'lack of or insufficient information in many reports'. Unsurprisingly, the report contained a reminder of the obligation of states to enact and enforce domestic legislation (required by the resolution), even for those that do not produce or handle nuclear, biological or chemical weapons or related materials on their territory. Two days later, the UN Security Council passed resolution 1673, which extended the mandate of the 1540 Committee until 2008 and

called on those states that had not yet submitted an initial report to the committee to do so ‘without delay’.

UN Security Council resolution 1673 (2006) called on the committee to embark on a work programme focused on outreach, dialogue, assistance and cooperation vis-à-vis member states, as well as on monitoring the status of implementation resolution 1540. The new work programme, which took more than four months to agree, contains substantial detail on the committee’s supportive activities, particularly in the much-needed area of technical and other implementation assistance. Before it can address states’ implementation needs, the committee must tackle the continued absence of a first report by many states—90 per cent of non-reporting nations come from three geographic groupings (Africa, the Caribbean, and the Pacific Islands). Consequently, the committee is set to intensify its outreach activities, particularly by holding further regional seminars.

Meanwhile, on 19 May 2006, the committee launched a legislative database containing information on states’ laws, regulations and other measures relevant to resolution 1540. This may prove useful to the 32 states that requested implementation assistance. Unless those states respectively requesting or offering assistance actually follow the report’s recommendation on more proactive assistance coordination, however, it is unlikely that the rate and effectiveness of states’ implementing measures will improve significantly before the committee’s mandate expires again.

Sources: ‘Report of the Committee established pursuant to resolution 1540 (2004)’, 25 April 2006, <http://disarmament2.un.org>; ‘Briefing by the Chairman of the Security Council Committee established pursuant to resolution 1540 (2004)’, 30 May 2006, <http://disarmament2.un.org>; ‘Fifth Programme of Work of the Security Council Committee established pursuant to resolution 1540 (2004)’, 27 July 2006, <http://disarmament2.un.org>; George Bunn, ‘Enforcing International Standards: Protecting Nuclear Materials from Terrorists Post-9/11’, *Arms Control Today*, January–February 2007, www.armscontrol.org.

Time for action on waste convention

Proceedings at the latest international waste conference were overshadowed by a waste dumping incident in August 2006 in Abidjan, Côte d’Ivoire. The incident involved the dumping of some 528 tonnes of hazardous waste from a Dutch-chartered, Greek-managed and Panamanian-flagged tanker. Subsequently, several thousand Abidjan residents sought treatment, resulting in several dozen being hospitalized and at least ten people losing their lives.

The eighth meeting of the Conference of the Parties (COP) to the 1989 Basel Convention on the Control of Transboundary

Movements of Hazardous Wastes and their Disposal took place in Nairobi, Kenya, from 27 November–1 December 2006. The Basel Convention’s key objectives are to minimize the generation of hazardous waste in terms of quantity and degree of threat, to dispose of it as close to the source as possible, and to reduce its movement. The Secretariat of the convention, which entered into force in 1992, provides assistance and guidelines on legal and technical issues, gathers statistical data and conducts training on the proper management of hazardous waste.

Much attention at the meeting was put on the Côte d’Ivoire incident and how to address the problem of discarded electronic appliances (‘electronic waste’ or ‘e-waste’). The event, which calls into question the level of implementation of the convention, prompted a COP decision calling for technical and financial help for Côte d’Ivoire. It highlighted the need to clarify the respective competencies of the Basel Convention and the 1973 International Convention for the Prevention of Pollution from Ships (MARPOL), because it was not clear which treaty applied in this case.

The 1995 Ban Amendment to the Basel Convention has yet to enter into force. This prohibits the export of hazardous waste from certain listed developed countries to developing nations. The European Union (EU) already applies such a ban. However, the incident, which involved a Dutch oil-trading firm, underscored the need for tighter controls and consequently helped to spur the European Commission into proposing stronger EU penalties for eco-crime in early February 2007. It also underscored the need for adequate tracking systems for the movement of waste.

From e-waste . . .

With regard to e-waste, COP8 examined how and to what extent the convention should tackle this type of waste. A Basel Convention working group will prepare a plan on the environmentally sustainable management of electronic waste for consideration in autumn 2008. Countries also agreed to promote clean technology, phase out hazardous substances, and work together to combat the illegal waste trade.

. . . to ship recycling

The COP again addressed the issue of ship recycling and reiterated that the law that the International Maritime Organization (IMO) is developing on this issue should establish an equivalent level of control to that of the Basel Convention.

Reporting procedures

The COP also called on the Basel Convention Secretariat to:

- assist parties in improving the comparability of their data on the transboundary movement of hazardous and other forms of waste;
- prepare and publish compilations of information obtained through questionnaires on treaty implementation.
- continue to provide training to developing countries and others in need of assistance, in order to help them meet their reporting obligations. Such assistance is to be delivered through workshops organized by Basel Convention regional centres, or via other appropriate mechanisms.

Sources: ‘Report of the Conference of the Parties to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal on its Eighth Meeting’, UNEP/CHW.8/16, 5 January 2007, www.basel.int; Information leaflets on the Basel Convention website, www.basel.int; ‘Summary of the Eighth Conference of the Parties to the Basel Convention: 27 November–1 December 2006’, *Earth Negotiations Bulletin*, IISD, vol. 20, no. 25, www.iisd.ca; ‘Companies deny liability for pollution’, *ENDS Daily*, no. 2262, 14 February 2007; ‘Commission launches EU eco-crime law’, *ENDS Daily*, no. 2259, 9 February 2007; ‘UN agrees new steps to curb waste dumping’, *ENDS Daily*, no. 2219, 5 December 2006; ‘Ivorian cabinet quits over waste’, BBC News Online, 7 September 2006, www.bbc.co.uk; ‘Ivory Coast ‘toxic ship’ inquiry’, BBC News Online, 27 September 2006.

Verification in Iran in regression . . .

Having restarted uranium conversion in 2005, Iran focused on enrichment in 2006. On 7 January 2006, it decided to initiate ‘small scale research and development’ at the Pilot Fuel Enrichment Plant in Natanz (see *Trust & Verify*, no. 122). In response, France, Germany and the UK requested a special meeting of the IAEA Board of Governors. The Board convened on 2 February 2006 and decided, in a resolution dated 4 February, to request that the IAEA Director General send all Agency reports and adopted resolutions to the UN Security Council. Iran reacted harshly, informing the IAEA on 6 February that it would cease provisional implementation of the Additional Protocol to its Comprehensive Safeguards Agreement. Iran signed the accord on 18 December 2003, but has not ratified it.

Two UN Security Council resolutions backed up the IAEA’s resolution. The first, resolution 1696, set Iran a deadline of 31 August to re-suspend its enrichment programme. The second, resolution 1737, specifies a number of measures to curtail the development by Iran of ‘enrichment-related, reprocessing or heavy water-related activities’ and ‘nuclear weapon delivery systems’. These measures include sanctions tailored to affect Iran’s nuclear programme. The resolution also set in motion a review of technical cooperation projects between the IAEA and Iran, which led to the suspension of a number of projects.

Iran’s decision to cease the provisional application of the Additional Protocol has had a number of consequences for verification. Within a week, the IAEA reportedly removed surveillance equipment installed in connection with the Additional Protocol. Although some remains in place—namely that installed in connection with Iran’s CSA—questions have been raised about its adequacy. In particular, the Agency has sought to replace the cameras monitoring cascades at the PFEP with remote monitoring hardware that is capable of sending signals off-site. The decision also had a direct impact on the number of days Agency personnel spent in the country. The number of Agency visits and inspections in Iran in 2006 was significantly less than that in 2004 and 2005.

Iran’s decision to stop applying the Additional Protocol has also significantly degraded the IAEA’s ability to assess the completeness and correctness of its declarations. This is particularly unfortunate, since various questions about Iran’s

Box 2

Visits to and inspections in Iran, 1 January–14 November 2006 (by facility)

Iran Nuclear Research Reactor (IR-40), Arak, central Iran

- 19 February: Design Information Verification (DIV)
- 22 April: DIV
- 12 July: DIV
- 30 August: DIV

Fuel Enrichment Plant (FEP), Natanz

- 11 April: Visit
- 7 June: DIV
- 26 July: DIV
- 26–30 August: DIV
- 5 November: DIV

Pilot Fuel Enrichment Plant (PFEP), Natanz

- 2–3 May: Inspection (with sampling)
- 6–7 June: Inspection
- 26–30 August: DIV
- 16–18 September: Physical Inventory Verification (PIV)

Uranium Conversion Facility (UCF), Esfahan

- 20–24 May: PIV
- 26–30 August: DIV

Fuel Manufacturing Plant (FMP), Esfahan

- 8 July: DIV

Karaj Waste Storage Facility

- 8 August: IAEA takes environmental samples from containers

Box 3

Containment and surveillance in Iran, 1 January–14 November 2006 (by date)

- 10–11 January: Seals removed in the presence of Agency inspectors at Natanz, Farayand Technique, and Pars Trash facilities.
- 29 January: Two uranium hexafluoride (UF₆) cylinders at Natanz placed back under IAEA containment and surveillance.
- 5 February: Iran ceases to apply provisionally its additional protocol.
- 12 February: IAEA curtails containment and surveillance at the UCF.
- August (day unknown): Agency installs additional cameras at the PFEP to monitor a second cascade of centrifuges. Iran refuses to discuss other forms of remote monitoring at the facility.
- 14 November: IAEA confirms that since 31 August, satellite imagery has been used to monitor the construction at Arak of the IR-40 reactor. Still no discussion about remote monitoring at the PFEP.

Sources: 'Director-General's Reports: Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran', GOV/2006/15, GOV/2006/27, GOV/2006/38, GOV/2006/53 and GOV/2006/64, www.iaea.org; 'Statement by the Deputy Director General Heinonen to the Board of Governors: Implementation of Safeguards in the Islamic Republic of Iran', 31 January 2006, www.iaea.org.

Note: Other inspections may have occurred but were not reported in public IAEA documents.

nuclear programme are outstanding. The IAEA, for example, has been unable to determine the source of all high and low enriched uranium contamination found at various locations in Iran. It has also yet to gain a full understanding of the extent of Iran's centrifuge enrichment programme. While some progress has been made—on a voluntary basis—in gaining access to military sites, the Agency is not in a position to conclude that there are no undeclared nuclear materials or activities. Iran has responded by saying that the IAEA has only been able to make such a determination in eight states and that most of these do not have an advanced nuclear fuel cycle.

... while Iran showboats 'technical progress'

On 13 April 2006, at a lavish ceremony complete with doves and traditional dancing, Iran announced that it had successfully enriched uranium to 3.6 per cent and had thus 'mastered' the technology. This claim proved to be somewhat premature,

as over the next few months the IAEA reported that Iran's one cascade was largely run under vacuum (that is, without UF₆ being introduced). Moreover, progress on installing further cascades at the PFEP was slow. Eventually, in October, some four or five months behind schedule, a second cascade was completed and tested with uranium hexafluoride (UF₆). In January 2007, with only two out of six cascades in the PFEP finalized, Iran began to install centrifuges in its industrial-scale facility, the Fuel Enrichment Plant. Unconfirmed reports state that it has now installed two 164-machine cascades there.

In contrast to enrichment, Iran's conversion programme does seem to have reached maturity and is now producing UF₆ at a rate close to its design capacity. The Heavy Water Production Plant at Arak was finished in 2006, although the heavy water reactor it is designed to service is still some years away from completion. In addition, there is no evidence that Iran has restarted any of its declared reprocessing experiments.

Sources: 'Director-General's Reports: Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran', documents GOV/2006/15, GOV/2006/27, GOV/2006/38, GOV/2006/53, GOV/2006/64, www.iaea.org; 'Statement by the Deputy Director General Heinonen to the Board of Governors: Implementation of Safeguards in the Islamic Republic of Iran', 31 January 2006, www.iaea.org.

Box 4

Key terminology

- **Visit:** 'The presence of IAEA inspectors at a facility for purposes other than a safeguards inspection or complementary access'.
- **Inspection:** Under an INFCIRC/153-type safeguards agreement, a set of activities carried out by IAEA inspectors at a facility or a location outside facilities to verify that the nuclear material declared and placed under safeguards continues to be used for peaceful nuclear activities or is otherwise adequately accounted for.
- **Design Information Verification (DIV):** Activities carried out by the IAEA at a facility to verify the correctness and completeness of the design information provided by the state. An initial DIV is performed at a newly built facility to confirm that the 'as-built facility' is as declared. A DIV is carried out periodically at existing facilities to confirm the continued validity of the design information and of the safeguards approach.
- **Physical Inventory Verification (PIV):** An inspection activity that follows closely, or coincides with, physical inventory taking by the operator.

Source: IAEA, *IAEA Safeguards Glossary: 2001 edition*, International Nuclear Verification Series, no. 3. IAEA/NVS/3/CD, IAEA, Vienna, June 2002.

A black October for the nuclear testing moratoria

The eight-year global moratorium on nuclear weapons testing ended on 9 October 2006 when North Korea conducted its first test. The test, which took place at 10:35 local time, occurred at an underground site near Kilchu in the northeast of the country. Given that North Korea is known to have reprocessed fuel from its heavy water reactor at Yongbyon and is thought to have only rudimentary enrichment technology (if indeed it has any at all), the device was almost certainly a plutonium-fuelled implosion weapon.

The event's seismic signal was the initial indicator of the event, which according to the US Geological Survey had a magnitude of 4.2. Based on the seismic evidence alone, it was clear that this was an explosion and not an earthquake. Pinning down the cause of the blast proved more difficult. Although further analysis of the seismic signal tended, on balance, to support the nuclear hypothesis, the first definitive claim came on 16 October when the US government announced that it had detected fallout. It was widely reported that the US analysis confirmed that the device was made from plutonium, although there was no independent substantiation of this at the time.

Encouragingly, the verification system for the 1996 Comprehensive Nuclear Test Ban Treaty (CTBT) seems to have independently confirmed the US assessment. The seismic stations of the International Monitoring System (IMS) had little trouble in detecting the test, at a seismic magnitude of 4.1. On 10 January 2007, moreover, it emerged that the radionuclide monitoring component of the IMS succeeded in picking up fallout. On 22–23 October, and again on 26–28 October, Radionuclide Station RN16 in Yellowknife, Canada, sensed 0.3–0.6 millibecquerels of xenon-133, a level that results from only 200–400 atoms. Given that the radionuclide monitoring network is not complete, its detection of the North Korean test was certainly an accomplishment. Hopefully, the successful identification of a test smaller than one kilotonne will finally lay to rest any remaining doubts about the verifiability of the CTBT.

Following the test, on 14 October 2006, the UN Security Council unanimously passed resolution 1718. Among other things, the resolution bans imports to and exports by North Korea of various military, dual use and luxury items. Much debate about the resolution centred on verification of this provision. Ultimately, it was decided that the resolution should call on states to conduct inspections of cargo originating from or leaving North Korea in order to prevent 'trafficking in nuclear, chemical or biological weapons, their means of delivery and related materials'.

For further information see 'VERTIC Statement on the seismic event in North Korea on 9 October 2006', 12 October 2006, www.vertic.org.

... while the test ban verification regime expands dramatically

Russia has ratified its Facility Agreement with the Comprehensive Nuclear Test Ban Treaty Organization (CTBTO). Such agreements afford the CTBTO the legal and administrative authority to work on a state's territory to establish, upgrade or provisionally operate and maintain monitoring stations. These stations form the backbone of the regime set up to verify compliance with the CTBT. As a nuclear weapon state, Russia hosts a significant number of facilities, the majority of which are located near the country's shutdown nuclear test sites. Meanwhile, the small European state of Moldova ratified the CTBT on 16 January 2007, bringing all of Europe under the treaty.

Sources: CTBTO, 'Facility Agreement with Russia enters into force', press release, 27 December 2006, www.ctbto.org; CTBTO, 'The Republic of Moldova ratifies the Comprehensive Nuclear-Test-Ban Treaty: All States in Europe Party to the Treaty', press release, 31 January 2007, www.ctbto.org.

Stunted progress in the CCW, again . . .

The Third Review Conference of the 1980 Convention on Certain Conventional Weapons (CCW) took place in Geneva on 7–17 November 2006. Entry into force of the treaty's fifth protocol concerning explosive remnants of war (ERW) on 12 November 2006 spawned some optimism among states and non-governmental organizations (NGOs).

The conference discussed cluster munitions in depth—a weapon type not covered by the convention. The issue had some topicality, as Israel allegedly used cluster bombs on at least 170 villages and other places in southern Lebanon during the 12 July–8 September 2006 military campaign. However, the conference's consensus rule blocked efforts to incorporate a ban on these weapons in the CCW, prompting Norway to arrange a meeting of states on 22–23 February 2007 to discuss ways forward. Forty-six of the states that participated in the Oslo Conference on Cluster Munitions, together with the UN organizations, the International Committee of the Red Cross (ICRC), the Cluster Munitions Coalition and other humanitarian agencies in attendance, agreed an action plan to conclude a treaty banning cluster munitions by 2008.

A group of states expressed disappointment at the lack of progress in Geneva towards a protocol governing mines other than anti-personnel mines (MOTAPM) and anti-vehicle mines (AVM), despite the proceedings of the Group of Gov-

ernmental Experts (GGE). A ‘Set of Provisions on the Use of MOTAPM/AVM’ was produced, but the GGE failed to agree on articles regarding ‘detectability’ or ‘active life’ due to persistent disagreement over definitions.

The GGE will meet again formally in June 2007, with its work informing the first ERW Conference and a Meeting of the High Contracting Parties to the Convention. The latter will involve, inter alia, discussion of issues concerning compliance and MOTAPM.

Sources: official documents of the Third Review Conference of the High Contracting Parties to the Convention, www.unog.ch/disarmament; official documents of the CCW GGE Fifteenth Session, 28 August–6 September, Geneva, www.unog.ch/disarmament; Steve Goose (Human Rights Watch), ‘Statement during the Final Plenary of the Third Review Conference of the CCW’, 17 November 2006, www.hrw.org/arms; Cluster Munition Coalition, ‘NGOs call on states to join Norwegian initiative for new cluster munition treaty’, press release, 17 November 2006, www.stopclustermunitions.org/news.asp; Mines Action Canada, ‘Global movement to ban clusters picks up steam but Canada noticeably silent’, press release, 20 November 2006, www.minesactioncanada.org; ‘Israel cluster-bombed 170 sites: UN’, *The Daily Telegraph*, 23 August 2006, <http://news.com.au>; Oslo Conference on Cluster Munitions, *Oslo Declaration*, 23 February 2007, www.regjeringen.no.

UN climate change conference: negotiations crawl forward

Much has changed since the 1997 Kyoto Protocol entered into force on 16 February 2005. Between 28 November and 9 December 2005, the First Meeting of Parties to the Kyoto Protocol (MOP1) took place in conjunction with the Eleventh Conference of Parties (COP11) to the UNFCCC. Held in Montreal, Canada, these events saw the operationalization of the Kyoto Protocol and the opening of talks on the future of the climate change regime.

On 30 October 2006, British economist Sir Nicholas Stern released his much-anticipated review of the economics of climate change. His report argues that tackling climate change is a pro-growth strategy for the longer term. According to Sir Nicholas, the earlier effective action is taken the less costly it will be, and ignoring climate change will eventually damage economic growth. Most recently, in February 2007, the Intergovernmental Panel on Climate Change (IPCC) released findings from the first part of its Fourth Assessment Report, which covers the physical science basis of climate change. Two forthcoming IPCC reports will examine the vulnerability of socio-economic and natural systems to climate change, negative and positive consequences of climate change, and options for adapting to it as well as for limiting greenhouse gas emissions and otherwise mitigating climate change. The physical science

basis report states that global concentrations of carbon dioxide, methane and nitrous oxide have increased markedly because of human activities, and that the warming of the climate system is unequivocal. The panel concluded with very high confidence that human activities have led to a warming of the climate.

Encouraging moves to reverse this trend are afoot. Business and industry are starting to engage, either on their own initia-

Verification Quotes

‘I think there were assumptions that they were getting something for nothing—not true. This time the North Koreans—it’s trust but verify time’

White House Press Secretary Tony Snow explains why this time, the Agreed Framework will work; Meet the Press with Tim Russert, NBC News, 18 February 2007.

‘It’s going to take some verification ...’

Speaker of the US House of Representatives, Nancy Pelosi, on what would really ensure North Korean disarmament; Jim Lehrer Newshour, PBS, 14 February 2007.

‘It allows North Korea to continue its highly enriched uranium program with no verification, no checks, no possibility of being sure that we’ve brought that to a halt’

Former US Ambassador to the UN John Bolton on why he (now) thinks verification is a good thing; Special Report with Brit Hume, Fox News, 13 February 2007.

‘The IAEA cannot shoot its way into Iran or parachute people in...’

A ‘senior diplomat’ rules out the possibility of an IAEA aerial invasion of Iran, as quoted in Mark Heinrich, ‘Senior atom inspector removed from Iran post’, Reuters, 13 February 2007, www.reuters.com.

‘They’re inspector shopping’

US Department of State Spokesperson Sean McCormack describing Iran’s approach to nuclear inspections; Daily Press Briefing, 26 January 2007, www.state.gov.

‘[T]he fact that you are showing us some pieces of papers and you call them documents, they do not solve any problem ... There should be a court to prove the case and to verify the case’

Iranian President Mahmoud Ahmadinejad on why he (now) thinks verification is a good thing, Good Morning America, ABC News, 12 February 2007.

tive or via national, regional or international policy instruments. The EU Emissions Trading Scheme (ETS), launched on 1 January 2005, is one of Europe's major climate change policy mechanisms and covers some 12,000 industrial plants across the 25 member states, responsible for almost one-half of the EU's output of carbon dioxide. But action is not only occurring in Europe: even in countries that have not ratified the Kyoto Protocol, such as Australia and the US, there is increased action at the state level.

Accordingly, COP12/MOP2 was held in Nairobi, Kenya, on 6–17 November 2006 against a backdrop of mounting concern and engagement on climate change. This conference, though, saw only limited overall progress. While the negotiations moved forward, the pace did not reflect the magnitude of the problem. The conference negotiations centred on two main issues: adaptation to climate change on the part of developing countries; and the future of the climate change regime.

Discussions on adaptation . . .

With respect to adaptation to climate change, agreement was reached on a number of key procedures: the Adaptation Fund (established to generate money to assist developing countries adapt to climate change); an adaptation work programme; and a capacity-building framework for the Clean Development Mechanism (CDM). Under the CDM, industrialized country parties can reduce the costs of meeting their emissions reduction targets by implementing projects that lead to emissions reductions in developing country parties. Nevertheless, more work needs to be done to ensure that the Adaptation Fund is supplied with sufficient resources and that the CDM process covers more countries and more activities, while maintaining and improving on its environmental effectiveness.

. . . the future of the regime

Discussions on the future of the climate change regime were channelled through several negotiating processes, which took place under the protocol and the convention. Under the protocol, processes included industrialized country emissions reduction obligations after the first commitment period (2008–12), a review of the protocol, and a Russian proposal to develop procedures to approve voluntary commitments. Under the convention, there was a dialogue on long-term cooperative efforts to examine advancing development goals in a sustainable way, realizing the full potential of market-based opportunities, addressing action on adaptation and harnessing the entire capabilities of technology. However, little substan-

tive headway was made in these processes. Much work and significant decisions have been left for future meetings. The negotiations will need to accelerate to ensure that there is no gap between commitment periods and that the carbon markets get a strong signal of continuity. Likewise, greater impetus is needed to guarantee that paths to sufficient emissions reductions can be laid down promptly.

. . . and on the compliance system

With regard to verification, the Nairobi conference saw the adoption of rules of procedure for the Compliance Committee. However, as at COP11/MOP1, no agreement was reached on the issue of amendment of the protocol in relation to compliance. This issue was deferred to the next meeting of the UNFCCC's Subsidiary Bodies (SB). The SB will meet in Bonn, Germany, from 7–18 May 2007. No agreement was reached on whether the synthesis report on industrialized countries' demonstrable progress reports should provide an overview (the industrialized country preference) or a more detailed assessment (the developing country preference). This matter was also deferred to the next SB meeting.

Busy year ahead for Kyoto Protocol verification processes

Looking ahead to the rest of the year, 2007 will see the protocol's verification processes enter a new and critical phase. Before the start of the first commitment period in 2008, a set of review and compliance procedures must be completed, which determine whether industrialized country parties are in compliance with the protocol's monitoring and reporting requirements. They also regulate the calculation, adjustment and fixing of industrialized country parties' assigned amounts of greenhouse gases. In addition, they determine industrialized country parties' eligibility to participate in the protocol's flexible mechanisms, that is, emissions trading, CDM and 'joint implementation' (under which they can reduce the costs of meeting their emissions reduction targets by implementing projects that lead to emissions reductions in other industrialized country parties).

Sources: 'Stern Review: The Economics of Climate Change', 30 October 2006, www.hm-treasury.gov.uk; 'Climate Change 2007: The Physical Science Basis', Summary for Policy Makers, IPCC Working Group I, 2 February 2007, <http://ipcc-wg1.ucar.edu>; 'Summary of the Twelfth Conference of the Parties to the UN Framework Convention on Climate Change and Second Meeting of the Parties to the Kyoto Protocol: 6–17 November 2006', *Earth Negotiations Bulletin*, vol. 12, no. 318, www.iisd.ca; UNFCCC reports of the UN climate change conference, Nairobi, 2006, www.unfccc.int.



A new use for neutrinos

Currently, the IAEA is not able to measure directly the quantity of fissile material inside a nuclear reactor. Instead, its safeguards strategy focuses on the verification of fuel while it is being loaded and unloaded. In between times, containment and surveillance measures are employed to detect any undeclared activities involving the reactor core. Now, however, developments in neutrino detection technology may permit the Agency to 'look' into the cores of operating reactors.

Neutrinos are fundamental particles with no charge and almost no mass. They are produced in vast numbers inside a nuclear reactor by the radioactive decay of fission products. Because they interact so weakly with matter, the radiation shielding stops almost none of them. Moreover, uranium-235 fission leads to neutrinos with an energy distribution different from that produced from by plutonium-239 fission. By measuring the rate or energy of the neutrinos issuing from a reactor, it is possible, therefore, to obtain an independent estimate of the quantities of the fissile materials inside.

However, the property that makes neutrinos useful—that is, they interact so weakly—also makes them extremely difficult to detect. It is only in the past few years that neutrino detectors have neared the sensitivity level required for safeguards purposes. In 2006, results from a trial experiment at the San Onofre power plant in California were announced, which give cause for guarded optimism about the practicability of this technique. More experiments are being planned in Brazil and France.

Sources: Ann Parker, 'Monitoring nuclear reactors with antineutrinos', *Science and Technology Review*, January/February 2006, www.llnl.gov; A. Bernstein, Y. Wang, G. Gratta and T. West, 'Nuclear reactor safeguards and monitoring with antineutrino detectors', *Journal of Applied Physics*, vol. 91, no. 7, 2002, <http://jap.aip.org>, pp. 4672–4676.

Nuclear breakdown

Since the advent of the Model Additional Protocol, a new emphasis has been placed on the detection of undeclared nuclear activities—past and present. Swipe sampling is the best-known and most effective technology developed for this purpose. Details of other techniques under development were presented at the IAEA's Symposium on International Safeguards: Addressing Verification Challenges in Vienna in

October 2006. One of the most exciting techniques on display was laser induced breakdown spectroscopy (LIBS).

LIBS involves the use of a high-powered laser to vaporise a tiny area from the surface of a sample to create a micro-plasma. A spectrometer then determines the plasma's composition. It is a highly sensitive technique that could, for example, be employed to gauge what materials had previously been stored in empty containers. Unlike swipe sampling, LIBS can (in theory, at least) be conducted entirely on-site and in real time, eradicating the need to transport samples to an IAEA analytical lab. LIBS is a well-established technique in other fields, but it has never been applied to safeguards before. Trials are under way; if it proves effective LIBS could help the IAEA to improve the timeliness of its findings.

Source: J. Whichello and D. Parise, 'Novel technologies for the detection of undeclared nuclear activities', IAEA-CN-148/32, paper presented at the Symposium on International Safeguards: Addressing Verification Challenges, Vienna, 16–20 October 2006.

Biorecognition: from lab to shop to field

The nanotechnology 'revolution' is coming to verification, in particular the field of biorecognition—detecting biohazards such as toxins, bacteria and viruses. David Russell, at the University of East Anglia in the UK, is developing a system based on gold and silver nanoparticles coated in sugars. Bio-hazard particles bind to the sugars causing the solution to change colour. Margaret Frey, at Cornell University in the US, is working on a similar system based on nanofibres. Antibodies on the surface of the fibre provide the means of detecting contaminants. Frey's group is currently figuring out how to make the fibre 'signal' that it has detected a biohazard. When accomplished, the nanofibres could be woven into a cloth that could be simply wiped across a surface to test for bacteria, viruses or toxins. Both techniques are in the development phase and even if they do not make it into the shops, the allure of real-time biorecognition suggests that similar products surely will.

A product that has reached the market recently is a hand-held anthrax detector manufactured by Veritide, a firm based in Christchurch, New Zealand. Few technical details are available but it is described as an optical detector (presumably relying on diffraction to identify anthrax spores). Veritide claims that its detector, which does not require sample preparation

by users, can reveal as few as 100 spores in less than 10 minutes, even in the presence of other fine particles such as flour or talcum powder. Weighing less than one kilogram, this product could be an invaluable tool for first responders.

Meanwhile, in February 2007, the US Air Force commissioned its first Laboratory Response First Team Trailer. This is a mobile laboratory designed to detect 14 biological agents including plague and anthrax through on-site DNA analysis. The US Air Force ultimately intends to deploy seven such units. Given the absence of a multilateral biological weapons verification regime, national assets such as these will hopefully be employed in supporting the UN Secretary-General's investigation mechanism, should the need arise (see 'A new strategy: strengthening the biological weapons regime through modular mechanisms', *Verification Matters*, no. 6, October 2006, VERTIC, London).

Sources: 'CU biodegradable wipe would quickly detect biohazards, from avian flu to E. coli', *Chronicle Online*, 11 September 2006, www.news.cornell.edu; Claire L. Schofield, Alan H. Haines, Robert A. Field and David A. Russell, 'Silver and gold glyconanoparticles for colorimetric bioassays', *Langmuir*, vol. 22, no. 15, 2006, http://pubs.acs.org, pp. 6707-6711; Mark Ward, 'Gold nanoparticles to trap toxins', BBC News Online, 5 April 2006, http://news.bbc.co.uk; www.veritide.com; Associated Press, 'New mobile trailer identifies biological agents', *The Wichita Eagle*, 7 February 2007, www.kansas.com.

And finally . . .

Animals are becoming ever more widely used in verification. This year the US Department of Defense awarded Virginia Commonwealth University a grant of US\$1 million to study the use of cockroaches and house flies in detecting bioagents. Recently, however, the star of the animalian verification show has been the bluegill fish, which have been employed in biosecurity in New York since 2001. San Francisco followed its lead in 2006, installing a tank for 8-12 fish at a water treatment plant. The fish are monitored for 'unexpected numbers of fish coughs or other forms of agitation'. According to Jeff Goodrich, President of Intelligent Automation, the firm that operates the system, 'the fish lead quite happy lives'. The same cannot be said of the crabs that scientists at the University of Maryland have been using in their experiments. Their system for detecting bioagents uses chitosan, a material derived from crab shell waste.

Sources: 'Scientists look to bugs for biosecurity', Global Security Newswire, 7 February 2007, www.nti.org; 'San Francisco uses fish to test water safety', Global Security Newswire, 6 September 2006, www.nti.org; 'Crab-shell waste used in WMD sensors', Global Security Newswire, 8 August 2006, www.nti.org.

www.vertic.org/NIM launches in April

VERTIC will launch a new 'national implementation measures' (NIM) section on its website in April 2007. The NIM section is one of a range of information materials that VERTIC is producing for its project on 'National implementation of treaties and norms prohibiting weapons of mass destruction (WMD)'. (See page 22 for information about VERTIC's treaty fact sheet series.)

Visitors will be able to access the NIM section via the link at the top right of the VERTIC home page or at www.vertic.org/NIM. It features three categories of information:

- **Events:** find out about events, such as regional and sub-regional workshops and seminars and legislative assistance activities, that VERTIC will organize later in 2007 and in the first half of 2008.
- **Resources:** sample approaches to implementing legislation and examples of national focal point structures and activities.
- **References:** acronym list, reference and background articles about national implementation, and texts of the treaties and resolutions covered by VERTIC's project, and related documents.

VERTIC events and other meetings attended by VERTIC staff in 2006

10 January Presentation by Andreas Persbo (AP), 'Iran's Nuclear Programme' to 'Casus Belli Iran: Three times does the trick?' NGO forum in Amsterdam, Netherlands, organized by Alternative View and sponsored by the Humanist Institute for Cooperation with Developing countries (HIVOS), and the National Commission on Development Corporation and Sustainable Development (NCDO).

30 January–3 February First meeting of the UN Group of Governmental Experts on Verification in All its Aspects, New York (Angela Woodward (AW) served as an Adviser to the Chair).

13–14 March Climate Action Network General Assembly, Brussels, Belgium (Larry MacFaul (LM)).

27–31 March Presentation by AW, 'A model law: The Biological and Toxin Weapons Crimes Act', Interpol Regional Bioterrorism Prevention Training Workshop for Asian countries, Singapore.

11 April (VERTIC event) 'Approaches to national legislation for nuclear and biological weapons treaties, norms and UN Security Council Resolutions'. Seminar at the UN Secretariat, New York, in association with the UK Permanent Mission to the UN (Michael Crowley (MC), AW, AP).

2–3 May (VERTIC and Gulf Research Centre (GRC) event) 'Laying the foundations for a WMDFZ in the Gulf: approaches to national legislation for WMD agreements'. Gulf States regional workshop, Dubai, United Arab Emirates (MC, AW, AP).

8–12 May Second meeting of the UN Group of Governmental Experts on Verification in All its Aspects, Geneva (AW).

22–26 April Twenty-fourth session of the UNFCCC Subsidiary Bodies' meeting, Bonn (LM).

12 June (VERTIC event) 'Approaches to national legislation for nuclear, biological and chemical weapons agreements'. Seminar at the Foreign and Commonwealth Office (FCO), London, in association with the FCO (MC, AW, AP).

10–14 July Presentation by AW, 'A model law: The Biological and Toxin Weapons Crimes Act', Interpol Regional Bioterrorism Prevention Training Workshop for the Americas, Santiago, Chile.

27–28 April 'VERIFOR International Experts' Consultation: Verification in the Forestry Sector'. Seminar organized by the Overseas Development Institute (ODI), Palma, Majorca (AP).

7–11 August Third meeting of the UN Group of Governmental Experts on Verification in All its Aspects, New York (AW).

15–17 August 'New Nuclear Energy Technologies and Processes' seminar hosted at the Stockholm International Peace Research Institute (SIPRI), sponsored by the Moscow office of the Carnegie Endowment for International Peace (CEIP) (James Acton (JMA)).

22–23 August Presentation by AW, 'National Measures to Implement the Biological Weapons Convention in Latin America'. ICRC Regional Meeting of Experts on Arms in International Humanitarian Law, Buenos Aires, Argentina.

29–30 August (VERTIC event) 'Approaches to national legislation for nuclear, biological and chemical weapons agreements'. Middle East regional workshop held at the Cooperative Monitoring Center, Amman, Jordan (CMC-Amman) (MC, AW, AP, Jez Smith (JS)).

31 August–1 September Participation in conference on 'CTBT: Synergies with Science, 1996–2006 and Beyond'. Hosted by the CTBTO, Vienna (AP, JMA).

18–22 September IAEA General Conference, Vienna (AP attended as an observer).

4–5 October 'Nuclear Nonproliferation: Verification Reinforcement and Access to the Nuclear Fuel Cycle'. Workshop hosted by Fondation pour la Recherche Stratégique, sponsored by the French Ministry of Defence, Paris (JMA).

9 October (VERTIC event) 'Verifying the comprehensive nuclear test ban: 10 years of development'. Seminar held at the UN Secretariat, New York (AP, Jane Awford (JA)).

9–10 October (VERTIC and Regional Environmental Center for Central and Eastern Europe (REC) event) ‘Fulfilling the monitoring and reporting requirements under the UNFCCC and Kyoto Protocol: Facilitating appropriate and effective monitoring and reporting procedures and capacity building in Central Eastern and South Eastern Europe, the Russian Federation and Turkey’. Workshop held in Budapest, Hungary (MC, LM).

16–20 October Symposium on ‘International Safeguards: Addressing Verification Challenges’, Vienna (AP, JMA).

6 November (VERTIC and REC event) Seminar to present the VERTIC and REC workshop findings, Conference of the Parties (COP12) and Meeting of the Parties to the Kyoto Protocol (MOP2), Nairobi (LM).

7 November Presentation by MC, ‘Steps towards a Middle East WMD Free Zone—examining verification and national implementation measures’. Conference on ‘The Middle East Weapons of Mass Destruction Free Zone’, organized by the Centre for International Studies and Diplomacy, School of Oriental and African Studies (SOAS), and the British Pugwash Group, London.

9 November (VERTIC, British American Security Information Council (BASIC) and Harvard–Sussex Programme (HSP) event) Seminar to launch our joint publication, *Briefing Book for the BWC Sixth Review Conference 2006*, Geneva.

16–17 November Presentation by AP, ‘UN Security Council Resolution 1540 and its relevance for global export controls’, at the South Asian Strategic Stability Institute (SASSI) conference on ‘Strengthened Export Controls: Pakistan’s Export Control Experience Current and Future Challenges and Options’, Brussels.

20 November–8 December Sixth Review Conference of the Biological Weapons Convention (BWC), Geneva (MC, AW).

21 November Presentation by MC, ‘VERTIC’s Statement to the BWC Sixth Review Conference’, Geneva.

30 November–1 December Presentation by AW, ‘The national implementation of weapons-related treaties’. ICRC regional workshop on ‘International Humanitarian Law: New Treaties and Implementation—the East Asian Perspective’, Hanoi, Vietnam.

5 December (VERTIC and Interpol event) Presentation by AW, ‘Interpol’s Model Law to prohibit biocrimes and to

promote biosafety and biosecurity’. Seminar on ‘Biological weapons law’, held on the margins of the BWC Sixth Review Conference, Geneva.

VERTIC publications

- *Trust & Verify*, no. 122, March 2006.
- *Verification Matters*, no. 5, James Acton with Carter Newman, ‘IAEA verification of military research and development’, July 2006.
- *Verification Matters*, no. 6, VERTIC/Angela Woodward, Contributing editor/project manager, ‘A new strategy: strengthening the biological weapons regime through modular mechanisms’, October 2006.
- *Briefing Book for the BWC Sixth Review Conference 2006*, joint BASIC, HSP and VERTIC publication, October 2006.

Please consult the VERTIC website for information on contributions made by VERTIC staff to other publications.

Staff changes

James Acton became VERTIC’s second Science Fellow in January 2006, before becoming its first Science and Technology Researcher in April. **Jeze Smith**, the Quaker Peace and Social Witness (QPSW) Peacemaker who joined VERTIC as Assistant Information Officer and Networker in September 2005, finished his placement in August 2006, and in some style—his last assignment was to travel to Jordan to provide support for the VERTIC seminar on national legislation for weapons of mass destruction (WMD) agreements. The centre was pleased to welcome **Unini Tobun** as its new Administrator in March. Finally, 15 minutes of fame for our 2006 interns: **Oliver Dambock** from Germany, **Geoffrey Dietz** from the US, **Alessia Rinaldi** and **Laura Spagnuolo** from Italy, **Lisa Leitenbauer** from Austria and **Rafael Broch, Richard Grassby-Lewis, Joanna Little, Carter Newman** and **Max Postman** from the UK.

Board changes

In September 2006, **Lee Chadwick** resigned from the VERTIC Board of Directors. VERTIC wishes to thank Lee for many years of valued service to the organization, particularly in his role as Treasurer, which he carried out with tremendous professionalism and diligence.

Dr David Woolfe stepped down from VERTIC’s Board in February 2007 due to his increased teaching commitments and work with the Oppenheimer Institute. VERTIC thanks

JUNE 2006 FACT SHEET 1

WHY AND WHAT TO IMPLEMENT?

ENSURING EFFECTIVE NATIONAL LAWS ON NUCLEAR, BIOLOGICAL AND CHEMICAL WEAPONS

FACTS ABOUT INTERNATIONAL ARMS CONTROL AND DISARMAMENT LAW

- International arms control and disarmament regimes contain several obligations that could usefully be implemented into national law.
- The principal nuclear, biological and chemical weapons instruments are the:
 - 1963 Partial Test Ban Treaty (PTBT)
 - 1968 Nuclear Non-Proliferation Treaty (NPT)
 - 1972 Biological Weapons Convention (BWC)
 - 1980 Convention on the Physical Protection of Nuclear Material (CPPNM)
 - 1993 Chemical Weapons Convention (CWC)
 - 1996 Comprehensive Nuclear Test Ban Treaty (CTBT)
 - United Nations Security Council Resolution 1540 (2004)
- Arms control and disarmament law is supplemented with non-compulsory instruments, such as the guidelines of the Australia Group (on dual-use biological and chemical agents and equipment), the Nuclear Suppliers Group and the Zangger Committee (on dual-use nuclear materials and equipment).



More information on international arms control and disarmament agreements has been prepared by the Conference on Disarmament (CD) in Geneva, Switzerland.

VERTIC

JUNE 2006 FACT SHEET 2

NATIONAL IMPLEMENTATION MEASURES FOR THE 1963 PARTIAL TEST BAN TREATY (PTBT)

FACTS ABOUT THE TREATY

The 1963 Partial Test Ban Treaty (PTBT) entered into force on 10 October 1963. The treaty has 116 states parties. The treaty depositaries are the governments of the Russian Federation, the United Kingdom and the United States.

If your state has also joined the 1996 Comprehensive Nuclear Test Ban Treaty (CTBT), its obligations under the PTBT will be rendered obsolete when the CTBT enters into force.



IS MY STATE UNDER AN OBLIGATION TO IMPLEMENT THE PTBT?

Only industrial, the PTBT does not contain explicit reference to national implementing legislation. However, it is possible to give effect to these obligations by your state's legal system as a principle of international law that a state may not be held to be in breach for its failure to do so unless it can be shown to be in breach.

WHAT FORMS OF LEGISLATION SHOULD MY STATE CONSIDER?

The prohibitions under the PTBT could usefully be reflected in your state's criminal law. The following may apply to be prohibited:

- Any type of nuclear explosion in the atmosphere, in space and under water.
- Any other nuclear explosion in any other environment if the explosion could cause radioactive debris to spread outside the territorial limits of your state.

WHERE SHOULD MY STATE'S LEGISLATIVE DRAFTERS TURN FOR ASSISTANCE?

No international organisation is responsible for examining this treaty. Any state party may voluntarily choose to offer assistance to others, or to request specific assistance.

NOTE: Drafting team: 18 (London) from: James D. (UK) (United Kingdom) and 18 (London) from: James D. (UK) (United Kingdom) and 18 (London) from: James D. (UK) (United Kingdom)

VERTIC

JUNE 2006 FACT SHEET 3

NATIONAL IMPLEMENTATION MEASURES FOR THE 1996 COMPREHENSIVE NUCLEAR TEST BAN TREATY (CTBT)

FACTS ABOUT THE TREATY

The 1996 Comprehensive Nuclear Test Ban Treaty (CTBT) opened for signature on 24 September 1996. It has yet to enter into force.

The treaty has 176 signatories and 132 ratifications. The treaty depositary is the United Nations Secretary General.



IS MY STATE UNDER AN OBLIGATION TO IMPLEMENT THE CTBT?

Article III of the treaty requires of parties to take any necessary measures to implement this obligation under the treaty. All state parties must have such measures in place when the treaty enters into force.

WHAT FORMS OF LEGISLATION SHOULD MY STATE CONSIDER?

- National legislation should cover areas in which no prohibition for the state. This should apply to conventional as well as nuclear weapons and to any other party under jurisdiction or control. These measures should apply to citizens and legal persons such as companies. They should be included in your state's criminal and legal provisions covering weapons and nuclear materials.
- Other state obligations may also require national implementing legislation, for example nuclear safety provisions. Each state party must be capable of performing its responsibilities under the treaty. Moreover, if your state has a treaty monitoring system, national measures relating to the treaty, its implementation and operation of that system will be required.
- Where these provisions are national, measures could be provided by your state's executive branch under authority granted in implementing legislation or any other authority in your state's national law.

VERTIC

VERTIC's project on National Implementing Measures seeks to help states:

- understand what measures they need to take at the national level to comply with their obligations under certain arms control and disarmament treaties, norms and UN Security Council resolutions; and
- identify sources of technical and legislative assistance to aid them in drafting and implementing national measures.

The project primarily focuses on national implementation measures obligations arising under the: 1963 Partial Test Ban Treaty (PTBT); 1968 Nuclear Non-Proliferation Treaty (NPT); 1972 Biological Weapons Convention (BWC); 1980 Convention on the Physical Protection of Nuclear Material (CPPNM); 1993 Chemical Weapons Convention (CWC); 1996 Comprehensive Nuclear Test Ban Treaty (CTBT); and United Nations Security Council Resolution 1540 (2004).

VERTIC is producing a range of information materials under this project, including the pictured Fact Sheets, a *Guide to national implementation requirements under the principal nuclear, biological and chemical weapons agreements*, and a new section on the VERTIC website providing access to a wealth of national implementation resources. (See page 19 for more information about the NIM web pages.) It is also holding a series of seminars and workshops to raise awareness of the need for national implementation measures and to facilitate the provision of appropriate legislative assistance.

For more information, visit www.vertic.org or contact Jane Awford, VERTIC's Information Officer and Networker, by e-mail at jane.awford@vertic.org, by telephone on +44 (0) 20 7065 0880 or by fax on +44 (0) 20 7065 0890.

VERTIC is grateful to the UK Global Opportunities Fund (GOF) administered by the UK Foreign and Commonwealth Office (FCO), and the Government of the Kingdom of the Netherlands, for their generous support for this project.


JUNE 2006 FACT SHEET 4

NATIONAL IMPLEMENTATION MEASURES FOR THE 1980 CONVENTION ON THE PHYSICAL PROTECTION OF NUCLEAR MATERIAL (CPPNM)

FACTS ABOUT THE TREATY

The 1980 Convention on the Physical Protection of Nuclear Material (CPPNM) was signed on 3 March 1980 and entered into force on 8 February 1987.

The treaty has 116 states parties. The treaty depositary is the Director General of the International Atomic Energy Agency (IAEA).



IS MY STATE UNDER AN OBLIGATION TO IMPLEMENT THE CPPNM?

Yes, if your state has ratified or acceded to the treaty. The convention calls for a set of rules to be implemented to your legal system. For instance:

- Article 7 allows a number of acts or attempted acts, which should be prohibited.
- Article 8 requires your government to establish prohibition on the following listed in Article 7, which should, among other things, also cover the activities of individuals engaged in committing prohibited acts and.
- Article 10 and 11 set out criteria for the regulation of risks and responsibilities and Article 12 calls for international co-operation with national legislation for the purpose of facilitating the transfer of nuclear materials.

The IAEA has agreed a set of physical protection objectives that could be reflected in the national legal order. Your government should, according to these objectives, establish and maintain conditions to:

- prevent against the unauthorised removal of nuclear material in use and during transport;
- ensure the implementation of rigid and comprehensive measures for the care in transit and secure storage in order to reduce nuclear material present during of nuclear facilities and storage of nuclear material in use and during transport; and
- ensure or maintain the reliability of emergency or salvage.

The convention recognises that physical protection is the responsibility of sovereign states. Your government is required only to implement a selection of measures according to your national requirements.

VERTIC

JUNE 2006 FACT SHEET 5

NATIONAL IMPLEMENTATION MEASURES FOR THE 1968 NUCLEAR NON-PROLIFERATION TREATY (NPT)

FACTS ABOUT THE TREATY

The 1968 Nuclear Non-Proliferation Treaty (NPT) entered into force on 5 March 1970. The treaty has 188 states parties.

The treaty does not have a secretariat. However, the treaty tasks the International Atomic Energy Agency (IAEA) with verifying compliance. The treaty depositaries are the governments of the Russian Federation, the United Kingdom and the United States.



IS MY STATE UNDER AN OBLIGATION TO IMPLEMENT THE NPT?

Article II.1 of the treaty requires your state to accept nuclear obligations. A range of legislative measures are often necessary to ensure appropriate national implementation of obligations agreements.

Article II.2 of the treaty requires your state to accept export controls. Measures that require controls are stipulated in the respective state. These controls will be more effective if they are formulated in national law.

WHAT FORMS OF LEGISLATION SHOULD MY STATE CONSIDER?

Implementing the treaty prohibitions in your state's criminal law is often a suitable first step. Non-nuclear weapon states must prohibit the following acts:

- transfer of nuclear weapons or nuclear explosive devices;
- transfer of control over nuclear weapons or nuclear explosive devices;
- the manufacture of nuclear weapons or nuclear explosive devices;
- the selling of assistance in the manufacture of nuclear weapons or nuclear explosive devices; and
- the supply of assistance in the manufacture of a nuclear weapon or nuclear explosive device.

VERTIC

FEBRUARY 2007 FACT SHEET 6

NATIONAL IMPLEMENTATION MEASURES FOR UNITED NATIONS SECURITY COUNCIL RESOLUTION 1540 (2004)

FACTS ABOUT THE RESOLUTION

United Nations Security Council Resolution 1540 (2004) was adopted on 28 April 2004. It is legally binding on all UN member states.



WHY IS UNITED NATIONS SECURITY COUNCIL RESOLUTION 1540 RELEVANT?

UNSCR 1540 is a response to the threat to international peace and security caused by the proliferation of nuclear, chemical and biological weapons, as well as their means of delivery, to non-state actors.

The resolution aims to curtail this threat by requiring states to criminalise certain activities and to put in place appropriate and effective national laws and enforcement measures to prohibit and prevent the misuse of controlled items.

IS MY STATE OBLIGED TO IMPLEMENT ITS PROVISIONS?

Yes, if your state is a member of the United Nations. The resolution was adopted under Chapter VII of the UN Charter and is legally binding on all UN member states.

WHAT TYPES OF NATIONAL IMPLEMENTING MEASURES ARE REQUIRED?

UNSCR 1540 specifies those that must be addressed in national law and the areas of law affected by the resolution. These are: criminal, for example, control prohibited activities, transfer controls, regulatory systems for the control of nuclear, chemical and biological materials. Each state will decide the type of implementing measures it requires in accordance with its constitutional process. The scope of measures that your state adopts and whether you give effect to the resolution will depend on the specific objective with respect to the activities covered by the resolution.

VERTIC

VERTIC extends condolences on death of Dr John Gee

VERTIC was sorry to learn of the death in January 2007 of Dr John Gee, a member of its International Verification Consultants Network. John Gee was an enthusiastic supporter of VERTIC, especially its work on chemical weapons. As Deputy Director-General of the Organisation for the Prohibition of Chemical Weapons (OPCW), he was keen to involve non-governmental stakeholders in advancing the OPCW's work and the 1993 Chemical Weapons Convention (CWC). He was both helpful and encouraging with regard to VERTIC's study of the future of the OPCW, *Getting Verification Right*, published in 2002 for the treaty's first review conference.

John had a long career in the Australian diplomatic service, notably as a disarmament specialist. Before taking up his appointment at the OPCW, he played a key part in Australia's instrumental efforts to advocate, negotiate and implement the CWC. As a chemist, he understood the scientific and technical aspects, as well as the political ones, an invaluable and rare conjunction of talents. John was also a chemical weapons inspector for the UN Special Commission (UNSCOM) in Iraq, heading its working group on the destruction of chemical and biological weapons. Later he served as a consultant to the Iraq Survey Group (ISG), resigning after disagreeing with both its approach and findings, and with Australian government policy at the time. In so doing, he demonstrated his unwavering dedication to impartiality in verification. The award of the Order of Australia is a fitting tribute from his country to one who gave so much to the cause of disarmament and international security.

VERTIC extends its condolences to Dr Gee's family and friends.

him for his support and invaluable advice on nuclear issues during his time on the Board and looks forward to continued collaboration with him in future.

Funders

VERTIC is grateful to the following bodies for grants and commissions received or ongoing in 2006:

- **Esmée Fairbairn Foundation:** £72,000 to promote work on verification and implementation of climate change agreements.
- **Ford Foundation:** US\$125,000 to undertake research to assess how effectively states are implementing their obligations under UN Security Council resolution 1540.
- **Global Opportunities Fund** of the FCO: £272,000 to support a project on building and enhancing state capacity to implement effectively nuclear, chemical and biological weapons treaties, norms and UN Security Council resolutions.
- **Governments of Germany, the Netherlands, Norway and New Zealand:** £2,000 each to fund a seminar on 'Verifying the comprehensive nuclear test ban: 10 years of development' at the UN Secretariat in October 2006.
- **Government of the Netherlands:** £75,000 to support a project on building and enhancing state capacity to implement effectively nuclear, chemical and biological weapons treaties, norms and UN Security Council resolutions.
- **Government of the Netherlands:** £20,000 for a joint (with BASIC and HSP) project leading to the production of a *Briefing Book for the BWC Sixth Review Conference 2006*.
- **John D. and Catherine T. MacArthur Foundation:** US\$100,000 to support work to examine how effectively states are implementing their UN Security Council resolution 1540 obligations, and also to develop and promote modular approaches to strengthening the biological weapons regime.
- **Joseph Rowntree Charitable Trust:** £120,000 contribution towards the organization's core funding and £42,000 for VERTIC's transparency project.
- **Peace and Disarmament Education Trust (PADET):** NZ\$5,000 for a VERTIC staff member's participation in the BWC Sixth Review Conference.
- **Ploughshares Fund:** \$50,000 for a project to develop and promote modular approaches to strengthening the biological weapons regime.
- **Polden-Puckham Foundation:** £10,000 for VERTIC Science Fellowships.
- **United Nations Institute for Disarmament Research (UNIDIR):** US\$13,000 for VERTIC consultancy to the UN Group of Governmental Experts on Verification in All its Aspects, and US\$2,000 to develop a paper on civil society monitoring and verification.

Media coverage

VERTIC provided background briefings and comment to, and/or our events were covered by, the following media organizations in 2006: Agence France Press, *Al Arabiya* (United Arab Emirates (UAE)), Australian Broadcasting Corporation, British Broadcasting Corporation, *Business Day* (South Africa), *Christian Science Monitor*, Global Security Newswire (US), *Globe and Mail* (Canada), *The Guardian* (UK), *Gulf Today* (UAE), *The Independent* (UK), Islamic Republic of Iran Broadcasting (IRIB), Islamic Republic News Agency (IRNA), *Khaleej Times* (UAE), *Nature*, *New Scientist*, Quaker Peace and Social Witness (QPSW) *Journal Letters* (UK), Radio Netherlands, Rzeczpospolita (Poland), and The Times Online (UK). Many of these related to North Korea's test of a nuclear device on 9 October 2006. Other topics were Iran's nuclear programme and VERTIC's national implementation measures programme, including its Gulf States regional workshop and two model

New VERTIC postcode

VERTIC's postcode recently changed from EC2A 4JX to EC2A 4LT. We invite our readers kindly to change their records accordingly.

biological weapons laws on which VERTIC has collaborated with Interpol and the ICRC respectively.

VERTIC events & meetings attended by VERTIC staff in 2007

7–11 February Arms Trade Treaty Strategy Meeting, Ontario, Canada (MC).

1 March (VERTIC-facilitated event) Roundtable on verification of nuclear disarmament (closed seminar for senior practitioners), London.

building trust through verification

VERTIC is the Verification Research, Training and Information Centre, an independent, non-profit making, non-governmental organization. Its mission is to promote effective and efficient verification as a means of ensuring confidence in the implementation of international agreements and intra-national agreements with international involvement. VERTIC aims to achieve its mission through research, training, dissemination of information, and interaction with the relevant political, diplomatic, technical, scientific and non-governmental communities.

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