T&V@100: verification then and now

Although *Trust & Verify* was first published in the year that marked the end of the Cold War, there is little suggestion in its pages of the immense changes that were about to occur and that would fundamentally affect verification. Like everyone else, it seems, the verification community was caught off-guard by the fall of the Berlin Wall.

The first substantive article in the first issue of *Trust & Verify* considered the progress being made in gathering support among states parties to the 1963 Partial (or Limited) Test Ban Treaty (PTBT or LTBT) for the convening of a conference to consider converting the accord into a comprehensive ban on all nuclear tests. This was a superficially appealing but ultimately ill-fated attempt by Mexico to achieve a Comprehensive Nuclear Test Ban Treaty (CTBT) by the back door. Such a tactic was necessary because of opposition to a CTBT by all of the nuclear weapon states except (purportedly) the Soviet Union. An influential argument used against a CTBT at the time was that a ban on underground nuclear tests was unverifiable because such explosions would be indistinguishable from earthquakes. One of VERTIC's earliest projects involved determining the extent of the latest advances in seismology that could be used for CTBT verification and promoting a re-consideration of verifiability, in light of such advances, by treaty negotiators.

Today, of course, the CTBT is a reality. It was agreed in 1996 after several years of negotiation in the Conference on Disarmament (CD) in which the verification issue proved particularly important. Critical breakthroughs included: the new attitude of the Russian Federation, the successor state to the Soviet Union, towards on-site inspections (OSI) to investigate suspicious seismic events; the change of heart towards a CTBT by the US, based partly on improved verifiability using a range of technical means, including seismology; and the subsequent falling into line of the other nuclear weapon states—China, France and the UK. Currently, a Preparatory Commission based in Vienna, Austria, is establishing a unique global monitoring system for

About this special issue . . .

The first edition of *Trust & Verify* was published in June 1989 by the then Verification Technology Information Centre. VERTIC, just three years old, was headed by Patricia Lewis and was based in Southampton Street, London. The founding editor of *Trust & Verify* was John Grounds and the co-editor was Julie Cator. Richard Guthrie later became its long-serving editor. The first edition dealt entirely with arms control and disarmament verification, as that was VERTIC's original brief. After 1989 VERTIC broadened its agenda to encompass any international agreement that requires monitoring and verification, particularly environmental and peace accords. To mark the 100th edition of *Trust & Verify,* we present a bumper issue, with a lead article examining how far verification of arms control and disarmament agreements has come since issue number one. *Trust & Verify* wishes all of its readers a peaceful and prosperous new year.

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the treaty—a development that was only a gleam in the eye of the CD's Ad Hoc Group of Scientific Experts in 1989. However, the CTBT has not yet entered into force, due to a requirement that all states with a significant civilian nuclear capability must ratify it first. China, India, North Korea, Pakistan and the US are among those preventing the realisation of the most sought-after arms control agreement short of nuclear disarmament.

The first edition of *Trust & Verify* also announced, somewhat quaintly in retrospect, that the UK had opened its Porton Down Chemical Defence Establishment to Soviet observers to demonstrate Britain's commitment to a 'comprehensive and verifiable global ban' on chemical weapons. Today, of course, the Chemical Weapons Convention (CWC), agreed in 1992, is a fully functioning treaty with its own dedicated global verification system, based in The Hague, Netherlands. The world is not yet free of the scourge of chemical weapons—in particular the speedy destruction of the vast US and Soviet stocks has proved illusory and few Middle Eastern states have become parties—and the verification system has suffered teething problems. Yet the regime is rightly regarded as a model for both current and future arms control regimes.

In a substantial article the inaugural issue of *Trust & Verify* addressed the question of whether verification of a ban on sea-launched cruise missiles (SLCMs) was a potential stumbling block to the negotiation of a Strategic Arms Reduction Treaty (START). Negotiations on such a treaty were to be reconvened in Geneva, Switzerland, in June 1989. While the Soviets were insisting that SLCMs be included in the envisaged cuts, the Americans argued that, due to the difficulty of distinguishing between nuclear and conventionally armed missiles, verification would be impossible and SLCMs should therefore be disregarded. Today there are two START agreements, START I signed in 1991 and START II signed in 1993 (although this is not yet in force), both with sophisticated verification measures, including co-operative arrangements and extensive use of so-called national technical means (NTM) of verification. Such verification advances had been heralded in the 1987 Intermediate-range Nuclear Forces (INF) Agreement, but were taken further in START. Meanwhile the SLCM issue was resolved by leaving them formally unconstrained but subject to politically binding, but unverified, declarations of numbers and 'confidential' data exchanges.

Trust & Verify also noted a conference, in which VERTIC participated, on verification of a Conventional Armed Forces in Europe (CFE) Treaty. Just a year later the agreement was a reality, with a verification system, based on declarations and OSIs, which has functioned well and become a model for other contexts. Two years after that, the 1992 Open Skies Agreement was concluded, providing a possible verification tool not just for conventional arms agreements in Europe but also for a wide range of other arms control and peace accords.

Yet, despite the progress made since 1989, it is startling how little movement there has been in some areas of verification. Years of diplomatic and technical endeavour notwithstanding, there is still no verification regime for the ban on biological weapons enshrined in the 1972 Biological Weapons Convention (BWC). While there have been deep cuts in strategic nuclear forces, the challenge of verifying reductions in warheads, as opposed to delivery systems, such as missiles, has not yet been tackled—although research has revealed the modalities and technologies for doing so. Nor is there verification of unilateral tactical nuclear weapon constraints or of fissile material withdrawn from military programmes. In light of Iraqi and North Korean violations of their obligations under the Nuclear Non-Proliferation Treaty (in both cases discovered after 1989), International Atomic Energy Agency (IAEA) safeguards are being improved, but frustratingly slowly. Verification of conventional arms control remains largely confined to the CFE treaty. The Open Skies accord has only just entered into force, its technical capabilities now somewhat outmoded. While there have been enormous advances in verification-relevant technologies, such as satellite monitoring, computer power and communications, these have not always been exploited, usually because of sensitivities about sovereignty and confidentiality, cost considerations or institutional lethargy.

Most worryingly, the arms control and disarmament edifice built since 1989, with its accompanying verification regimes, is in grave danger from an unlikely source—the US. Unlike all of its predecessors, Democrat and Republican, the US administration of President George W. Bush appears deeply sceptical of the value of negotiated, verifiable agreements, in both the bilateral and multilateral fields. It appears content, instead, with unilateral, unverified declarations and vague confidence-building gestures. In some cases it seems bent on destroying what already exists. Most dramatically, it has announced its unilateral withdrawal from the 1972 Anti-Ballistic Missile (ABM) Treaty with Russia, an extraordinary event in international law generally and arms control in particular. It has also deliberately sabotaged multilateral efforts to establish a verification system for the BWC, withdrawn political, technical and financial support for work on the OSI regime for the CTBT and called into question the value of the Organization for the Prohibition of Chemical Weapons (OPCW).

All this is in stark contrast to the world portrayed by the first issue of *Trust & Verify*, where it was the Soviet Union that was verification's principal foe. Of course, important though the US is, it is not the only state whose scepticism about verification threatens the entire enterprise. China, India, Iran, Iraq, Israel and Pakistan all shelter behind the US stance, ready to raise their own objections when it suits them. Other states, among them those which previously championed verification, like Australia, Canada and the members of the European Union (EU), have stood mute while others wreaked damage.

In the light of such setbacks, there remains much to be done in the verification endeavour before the 200th edition of *Trust & Verify* rolls around. To begin, the line must be held against those who seek to roll back or hobble existing regimes. Particularly insidious are attacks made under the guise of exaggerated concerns about finance, confidentiality or sovereignty. Verification systems need to be lean and mean, but not so cash-strapped that verification falters, thereby undermining its credibility. Confidentiality concerns are legitimate, but they should not be misused to erect impenetrable national and international bureaucracies. Sovereignty is important, but states constantly trade bits of it in return for collective benefits, so verification should not be portrayed as unique in this respect. Verification may strengthen sovereignty by enhancing security.

New verification modalities, techniques and technologies need to be pursued. Some of these will help to relieve states' anxieties about verification by delivering reduced costs, more secure data and less intrusiveness. Others will undoubtedly mean greater intrusiveness and costs but will thereby provide greater reassurance where it is required. Long-range thinking about verification is also imperative, as currently being initiated by the UK in relation to future nuclear disarmament scenarios. Other technologically advanced states, especially those with nuclear weapons, need to become more engaged in such work. As demonstrated in the past, verification advances can hasten political progress. The emerging co-operation between international and non-governmental organisations in verification matters should be encouraged.

Trust & Verify will continue to monitor and analyse the verification challenges in arms control and disarmament and in an increasing number of other fields in the coming years, as it has done over the past 13. In the meantime, one almost longs for the return of US President Ronald Reagan, whose arms control slogan, 'Trust but verify', gave this publication its name.

Trevor Findlay, Executive Director, VERTIC

Scientific and Technical Means of Distinguishing Between Natural and Other Outbreaks of Disease

Malcolm Dando, Graham Pearson and Bohumir Kriz (eds)
Kluwer Academic Publishers, Dordrecht, 2001
US$87, EUR95, £60, pp. 171, ISBN 0-7923-6990-4

This book is the edited proceedings of the NATO Advanced Research Workshop on Scientific and Technical Means of Distinguishing Between Natural and Other Outbreaks of Disease, held in Prague, Czech Republic, from 18–20 October 1998. It describes the political and technical background to determining whether biological warfare agents have ever been used, the prohibitions against BW in the BWC and the ill-fated negotiations on a protocol to the treaty. The book's 14 chapters give information on possible pathogens, disease surveillance systems and relevant historical uses of biological weapons. In addition to the three editors, 17 international experts provide contributions.

A prime example of the problem of distinguishing between natural and man-made disease outbreaks occurred in the Soviet city of Sverdlovsk in 1979 when anthrax killed 68 people. The cause, not known definitively until after the collapse of the Soviet Union, was an accidental release of agent from an illicit BW production facility. The Soviets had pursued an offensive BW programme in violation of the BWC from the early 1970s until the country's demise in 1991. Much of the information that emerged in the mid-to-late 1990s about this incident is usefully summarised in this volume.

Disease outbreaks are politically sensitive, partly because they often occur in developing countries. The book describes how natural outbreaks, such as a 1994 pneumonic plague epidemic in India during a local festival honouring the rat king, may have unusual characteristics, suggesting that they are the result of a BW attack. Agents that might be used against humans, plants and animals are discussed and guidelines suggested for differentiating between natural and man-made outbreaks, including whether the disease has natural hosts ('vectors') native to the region and whether a strain shows signs of having been genetically modified.

While this book will be hard going for the general reader, it will, despite the delay in publishing it, be required reading for those who wish to enter the biological weapons priesthood or for those who wish to understand their arcane preoccupations better.

John Hart, Former On-Site Inspection Researcher, VERTIC

Climate change: Marrakech gives green light to ratification

In October 2001, *Trust and Verify* heralded the adoption of the Bonn Agreement by parties to the 1992 United Nations Framework Convention on Climate Change (UNFCCC). This agreement, reached on 27 July 2001, sets out the rules for the 1997 Kyoto Protocol, which aims to cut greenhouse gas emissions to 5.2 percent below 1990 levels. However, almost as soon as the gavel fell, parties began arguing over what exactly the deal meant. They continued to haggle at the seventh session of the conference of the parties (COP7) in Marrakech, Morocco, from 29 October–10 November 2001, as they attempted to translate the Bonn Agreement into legal text. Once again, the final deal was struck following a long night of political brinkmanship.

Yet, as before, agreement came at a price. Concessions had to be made to retain the support of the Umbrella Group, a loose consortium of countries including Australia, Canada, Japan and Russia. The Kyoto Protocol can only enter into force after it is ratified by at least 55 signatories, including those developed countries responsible for 55 percent of the greenhouse gases emitted by all developed countries in 1990. The rejection of the protocol by the US in March 2001 makes ratification by certain other developed countries even more vital to entry into force, giving them increased negotiating leverage. Consequently, the Umbrella Group forced significant concessions in relation to the eligibility criteria for the flexible mechanisms, fungibility and the banking of sinks. And Russia successfully negotiated an effective doubling of its sinks allocation from forestry activities in the first commitment period, beginning in 2008.

For the most part, difficulty lay in the technical detail. Perhaps for the first time, the issues of monitoring and verification, which were largely ignored in Bonn, assumed a high profile. Generally regarded as the 'backbone' of the protocol, the methodologies (Article 5), reporting (Article 7) and review (Article 8) have an integral role in the assessment of compliance and the operation of the flexible mechanisms. Therefore, the linkages between these aspects were of great importance as the text was being finalised.

One of these linkages related to annual reporting of sinks activities. The Bonn Agreement introduced extra sinks allowances to help parties meet their targets. But it was left to COP7 to make this decision operational in the legal text. The Group of 77 developing countries (G77), China and the EU felt that if parties wished to use these extra sinks, they should have to report them in their annual inventories (in the same way as they are required to report their emissions of the six greenhouse gases covered by the protocol). Yet, the Umbrella Group, concerned over the feasibility and costs of annual reporting and the fact that compliance with the annual reporting provisions was an eligibility requirement for the mechanisms, resisted this idea. The eligibility issue was of particular importance to Russia, which will find it difficult to meet the sinks reporting standards and thus might not be eligible to trade its 'hot air' (the difference between its permitted and actual greenhouse gas emissions). This, in turn, worries Japan, since it is likely to be the principal purchaser. The eventual deal was a compromise between the positions. Parties will have to report annually on both sources and sinks, but failure to meet the quality thresholds for the sinks data will not affect a party's ability to use the mechanisms.

Severing the link between sinks reporting and mechanisms eligibility removes the incentive for parties to provide quality data on their activities. However, the consequences of this are, to some extent, minimised. First, the provision is restricted to the first commitment period. Second, parties will only be able to add sinks tons to their assigned amount when they have complied with the methodological and reporting requirements and their inventories have been reviewed and any implementation questions resolved. This goes some way towards restoring the incentive for providing high quality sinks data and ensures that all tons in the system are measured by the same standards.

Another issue that played a cross-cutting role in the negotiations was Article 7.4, which provides guidelines for establishing a party's assigned amount and outlines the procedure for compliance assessment at the end of each commitment period. It also provides for a system of registries to keep track of transactions under the flexible mechanisms. Due to several controversies, these elements had not been discussed prior to COP7.

During previous meetings, parties introduced three currencies for the flexible mechanisms: assigned amount units (AAUs), representing parts of a party's emissions allowance, and clean development mechanism emissions reductions (CERs) and emissions reductions units (ERUs), which can be generated by projects under the clean development and joint implementation mechanisms respectively. At COP7, parties created a fourth curr-

ency—the removal unit (RMU)—to give a separate identity to sinks credits. According to the Marrakech Accords, all of these units are 'fungible' in that they are all equivalent to one ton of carbon and can be traded freely between parties.

The issue of banking unused credits to carry over into the next commitment period attracted much attention. Broadly, developing countries were against banking, which in their view would allow the developed countries to build up large 'cushions' to soften the impact of tougher targets in future commitment periods beyond 2012. To this end, the final deal precludes the carry-over of RMUs and limits that of CERs and ERUs. However, these rules are effectively symbolic since 'laundering' can be used to circumvent them.

Delegates also finalised the practical guidelines for monitoring and tracking the transfer of units between parties. Each party will need to set up its own national registry and the UNFCCC secretariat will maintain an independent transaction log that will form the basis of the compliance assessment at the end of the commitment period. Each unit will be tracked through the system using a unique serial number and every transaction will be automatically checked to ensure that both parties are eligible to use the mechanisms, that the units are valid and that neither party is exceeding the various limits set for sinks activities. Where a discrepancy is flagged, the transaction is cancelled, an expert review team (ERT) informed and parties are required to take corrective action within 30 days. The review teams will also undertake an annual audit, cross-checking transactions to ensure that parties have complied with the registry rules and that the integrity of the trading system is maintained.

At Japan's request, the review procedures were further modified to allow for a speedy process to restore a party's eligibility to participate in the mechanisms. The guidelines for this process still need to be developed. However, there are indications that the process could take as little as 10 weeks, instead of parties having to wait for the next annual review to have their case considered. Parties also resolved the long-standing argument over the composition of the ERTs. While the G77 and China felt that the teams should have equitable geographic balance, the developed countries felt that it was more important that they be selected on the basis of technical expertise. The final wording aims to satisfy both requirements by demanding a 'balance' of developed/developing country personnel, but that selection should not compromise the necessary skills of the team. The text also provides for training to enhance the expertise of developing country reviewers.

Verification Quotes

In the chaos of the fighting, verification of the Northern Alliance claims was impossible
Dexter Filkins, 'With one prize in hand, Afghan rebels press on', *New York Times,* 11 November 2001, p. 1.

Two Idiots Patrolling Hebron
Nickname given by Jewish settlers to the Temporary International Presence in Hebron (TIPH), *International Herald Tribune*, 22 August 2001, p. 4.

I personally consider that sound, verifiable arms control agreements and energetic non-proliferation strategies can and should be critical elements of American foreign policy
John Bolton, US Under Secretary of State for Arms Control and International Security, attempting to mollify critics during his Senate confirmation hearings, reported in 'Senate Narrowly Confirms Bolton to Top Arms Control Post', *Arms Control Today,* June 2001, p. 26.

The United States has repeatedly made clear why the arms control approaches of the past will not resolve our current problems . . . Countries that joined the BWC and then ignore their commitments and certain non-state actors would never have been hampered by the Protocol
John Bolton, Statement to the fifth Review Conference of the Biological Weapons Convention, Geneva, 19 November 2001.

We have a delinquent government of geriatrics who want to cling to power regardless of anything. So we will insist the elections be held under the full glare of scrutiny, because they want to cheat left, right and centre
Welshman Ncube, General Secretary, Movement for Democratic Change, commenting on the Zimbabwean government's attempts to prevent independent monitoring of presidential elections in 2002, *Guardian Unlimited,* 4 January 2002, www.guardian.co.uk.

NASA has got a project looking at the atmosphere. They have got satellites but use our data for verification
Dr Heinz Muller on data he collects using the mesosphere monitoring radar station he built himself in a garden shed for £8,000 and which will be used by the US ballistic missile defence research programme to reduce the destabilising effect of meteor winds on missile trajectory, reported in 'One of the world's top scientists works in an allotment shed equipped on a shoestring', *Western Daily News,* Bristol, UK, 5 July 2001.

The fact of the matter is that we had inspectors—the UN had inspectors in Iraq for a long period. We couldn't find beans
Donald Rumsfeld, US Secretary of Defense, Department of Defense News Briefing Summary, M2 PRESSWIRE via COMTEX, 3 December 2001.

The fiercest argument over interpretation of the Bonn Agreement concerned the issue of binding consequences for non-compliance. The G77, China and the EU agreed that the compliance text acknowledged the need for legally-binding consequences, but believed that it postponed a final decision until the first meeting of the parties after entry into force (known as

COP/MOP1). The Umbrella Group, though, was unhappy with any implication that the consequences of non-compliance should be binding. The final outcome reflects the EU's position, preserving the positive momentum towards the adoption of legally-binding consequences. Parties will return to this issue at the first COP/MOP.

While perhaps not as dramatic as the adoption of the Bonn deal, the Marrakech Accords do truly represent the final package. They incorporate all the necessary elements to permit the signatories to the Kyoto Protocol to ratify. In Europe this process is on track, with most EU member states predicting ratification before the end of 2002. However, the plans of the Umbrella Group are not so clear. Only Japan seems committed to early ratification, having announced its intention to complete preparations this year. Australia, Canada and Russia have not made encouraging statements and continued pressure is needed to convince them to ratify early.

In the meantime, some states have announced their intention to adopt tougher emissions reduction targets than those set in Kyoto in 1996. The UK has increased its target from -12.5 to -20 percent, Sweden from +4 to -4 percent and Germany from -21 to -25 percent. Sweden has gone further and said it will not use the sinks loopholes in the Bonn agreement or the flexible mechanisms to help meet its new target—although it has neglected to say whether or not it plans to bank these extra credits for use in the second commitment period. However, these statements demonstrate that parties are beginning to consider the first commitment period targets as only a first step and that consideration now has to be given to what happens next. This will be one of the agenda items at the World Summit on Sustainable Development (WSSD) in Johannesburg, South Africa, in August 2002.

The Marrakech Accords represent the rulebook for the Kyoto Protocol, which is the most far-reaching environmental agreement ever negotiated. At its core is a verification system that, if successful, will reassure parties that the terms of the protocol are being implemented fairly and effectively, as well as assessing each party's compliance with their emissions reduction targets. The innovative and often complex nature of the system, though, is likely to require effort from all stakeholders in order to iron out initial difficulties. As the emphasis changes from negotiation to implementation, parties will need to embrace a process of 'learning by doing' prior to the start of the first commitment period in 2008.

Molly Anderson, Environment Researcher, VERTIC

Monitoring for Impact: Lessons on Natural Resources Monitoring from 13 NGOs, Volumes I and II

Robert Livernash and David Hosansky (eds)

World Resources Institute, Washington, DC, 2000
Vol. 1, $20, pp. 90, vol. 2, $15, pp. 70, ISBN 1-56973-406-2

There is little doubt that the work of NGOs in developing countries is contributing to the advancement of environmental protection and sustainable development. Of the many tasks that NGOs carry out, field monitoring to assess the state of the environment or to verify proper enforcement of the law, is fundamental. Since there is little comprehensive literature on this activity, *Monitoring for Impact,* compiled by Global Forest Watch (GFW), is a welcome addition.

Volume I outlines the theoretical aspects of monitoring, while volume II illustrates theory through case studies of, and by, 13 NGOs. Each of these organisations describes the lessons learned from monitoring natural resources, especially forests. The NGOs were selected according to three criteria: they have monitoring programmes aimed at influencing environmental policy; they are independent; and they collectively represent experience from around the world.

Volume I presents an integrated framework for creating and implementing programmes for monitoring natural resources. After describing the aims and main aspects of monitoring, it sets out a 'route to successful monitoring' in three stages: planning, implementation, and communication and evaluation. The purpose of each stage is explained in detail, with examples of several options for implementation. The objective is to provide guidelines that can be altered to meet local needs. When describing the approach to data collection in the planning stage, for instance, the authors not only explain what data collection is, but also give different examples from the case studies contained in volume II, explain the advantages and disadvantages of alternative methods and furnish a list of supplier addresses and the prices of the necessary equipment. The last section draws attention to useful instruments and resources, such as web pages, communication strategy tools and computer packages. In addition, it contains short summaries of the case studies in the second volume.

Monitoring for Impact is a valuable book for any NGO seeking to create or perfect a monitoring programme. Its unique 'line of attack' separates it from other literature in this area and will certainly accord it the status of a respected reference work.

Alexandra González-Calatayud, Intern, Legal Affairs Division, World Trade Organization, Geneva

After downing the BW protocol, US sabotages review conference

The fifth Review Conference of the parties to the Biological Weapons Convention started and ended with a bang. Taking place against the background of anthrax attacks in the US, the opening of the conference, on 19 November 2001, was dominated by the statement made by the US Under Secretary of State for Arms Control and International Security, John Bolton. He accused four BWC states parties, Iran, Iraq, Libya and North Korea, as well as Syria (a signatory state) and Sudan (which has neither signed nor ratified the BWC), of violating the treaty.

After the Ad Hoc Group (AHG) of state parties failed in July and August 2001 to agree on a verification protocol for the BWC, the task of the Review Conference was to chart a way forward for talks on a strengthened convention. Bolton presented purportedly alternative US proposals, including criminalisation of biological weapons (BW) acquisition and possession, the tightening of national legislation against BW testing and manufacture, and strengthened investigative powers for the UN Security Council. He also made clear that, in Washington's view, the verification protocol is 'dead, and it is not going to be resurrected'.

Nonaligned countries, in contrast, continued to insist that discussions on measures to strengthen the BWC should continue in a multilateral forum. In the middle was the EU, which tabled a compromise paper, proposing annual meetings of state parties and open-ended governmental expert groups to consider new measures for strengthening the treaty.

Other controversial issues included compliance, transfers of biological agents and the creation of an investigation mechanism. As the meeting approached its last day, 7 December, compromises emerged on many issues. The chairman of the conference, Hungarian Ambassador Tibor Tóth, reported that 75 percent of the final declaration text was 'consolidated'. On the crucial matter of how to advance work on BW verification, the EU proposal for annual meetings of state parties seemed to provide a solution to the deadlock.

Hopes that the 91 of the 144 BWC state parties present in Geneva would be able to agree on a final declaration were dashed late in the afternoon of 7 December, when the US launched its final assault on the conference. Two hours before it was scheduled to end, the US delegation tabled a paper that supported EU language on a follow-on mechanism but demanded that, in return, the AHG mandate be 'terminated'. Both the timing and the wording of the paper aimed to ensure the failure of the conference. Preservation of the AHG mandate, after all, had long been the bottom line for many delegations. This had been made clear on several occasions without any objection from the US.

Reaction to the cynical US ploy was fast and furious. Even its closest allies, which had been completely taken by surprise, were damning. European diplomats did nothing to hide their shock and anger, accusing the US, in unattributable press briefings, of deceiving them. The EU states, as a result, boycotted a Western Group meeting.

Instead of letting the conference fail completely, delegates decided to adjourn it until 11–21 November 2002. Finding ways to fortify the convention following this disaster will not be easy. However, at least the cards are now on the table for the resumed meeting in Geneva. Proponents of a strengthened and verifiable BW ban will, in the interim, need to think creatively about ways out of the current deadlock.

Oliver Meier, Senior Arms Control and Disarmament Researcher, VERTIC

For VERTIC's statement on the review conference and its press releases issued at the end of the meeting visit the Centre's website at www.vertic.org

Verification Watch

CTBT Article XIV Conference: US boycott and little result

The second Conference on Facilitating the Entry into Force of the Comprehensive Nuclear Test Ban Treaty was held in New York from 11–13 November 2001, having been postponed from September due to the terrorist attacks. The conference—intended to bring CTBT signatories and parties together to encourage other states to sign and ratify the treaty in order to enable it to enter into force—was, for the most part, a non-event. The meeting was boycotted by the US, which has signed the treaty, but which, under the Bush administration, refuses to ratify. Since other states required for entry into force, such as India and North Korea, were also not in attendance, the conference was largely preaching to the converted.

The only notable initiative came from Russia, which suggested that, in order to strengthen the confidence-building measures (CBMs) provided for by the treaty, it was prepared to propose additional ones to the US, including exchange of geological data and 'results of certain experiments' (presumably so-called sub-critical nuclear tests) and installation of additional sensors (presumably in addition to those run internationally by the Comprehensive Nuclear Test Ban Treaty Organisation (CTBTO)). The catch was that these would only be developed after entry into force of the treaty, which would require US ratification. Those in the US opposing ratification argue, among other things, that strengthened CBMs are necessary before ratification can be considered.

Source Statement by H.E. Igor D. Sergeev, Assistant of the President of the Russian Federation on Strategic Stability at the Second Conference on Facilitating the Entry into Force of the Comprehensive Nuclear-Test-Ban-Treaty, New York, 11 November 2001 (unofficial translation).

Open Skies: better late than never

The Open Skies Treaty, signed in March 1992, finally entered into force on 1 January 2002. This occurred 60 days after the last remaining instruments of ratification required for entry into force, those of Belarus and Russia, were deposited. The entire territory of the 27 treaty parties (member states of the Organisation for Security and Co-operation in Europe (OSCE), including Canada and the US) is open to short-notice aerial observation by unarmed fixed-wing aircraft operating an agreed sensor suite with fixed imagery resolutions. The treaty is of unlimited duration.

Although entry into force has been delayed, the parties have had ample time to certify their observation aircraft and conduct trial observation flights in accordance with the terms of the treaty. The accord allows upgrading of the sensor suites provided the technology is commercially available and the measures are approved by consensus.

In the first six months after entry into force, other OSCE members not party to the agreement may apply to join. Finland and Sweden have already announced their intention to do so. After six months any country may request to accede, which in theory paves the way for a global open skies regime.

Source 'Open Skies Treaty to enter into force', *Arms Control Today,* December 2001, www.armscontrol.org; James J. Marquardt, 'Not a moment too soon', *Bulletin of the Atomic Scientists,* January/February 2002, pp. 18–19. For further background see *Trust & Verify,* May 2000.

Taking aim at small arms

An Additional Protocol to the 2000 Convention on Transnational Organized Crime was agreed by the United Nations General Assembly in May 2001. Under this Firearms Protocol, which aims to help eradicate the illicit manufacture of, and trafficking in, firearms, states must pass legislation requiring effective export control procedures, data exchange among law enforcement authorities and effective weapon marking systems and transfer records. As it governs only commercial trade in firearms, their components and ammunition, the proliferation threat from weapon transfers by governments, including to non-state actors, remains. In addition, the fact that the protocol does not mandate a uniform system for marking weapons may hamper verification of compliance. States must first ratify the convention before becoming a party to the protocol, which will enter into force once it has acquired 40 ratifications, but no earlier than the convention itself.

Source 'UN General Assembly adopts illicit firearms protocol', *Arms Control Today,* July/August 2001, p. 29; 'General Assembly adopts third additional protocol, on firearms, to Convention against Transnational Organized Crime', UN document GA/9866, 31 May 2001.

Nuclear material verification and safeguards: conflicting messages

- The IAEA's 45th General Conference in Vienna from 17–21 September 2001 adopted the agency budget for 2002, including US$87.9 million for nuclear verification and security of nuclear material, a US$5m (5.7 percent) increase on 2001.
- Three and a half years after the adoption of the Additional Protocol to improve nuclear safeguards, progress on ratification and implementation remains slow. As of 14 December 2001, only 58 states had signed such protocols and only 22 of these had entered into force. During the conference, the secretariat reported that baseline evaluation reports (for which an Additional Protocol is not necessary) had been completed for 54 states and that 18 states had submitted declarations under Article 2 of their protocols. Guidelines for the application of 'complementary access'—a key verification tool under the protocol—are still under development, even though such access had been requested in 11 states.
- Reflecting the increased fear of nuclear terrorism, the IAEA wants to expand its role in nuclear security. The conference adopted a resolution requesting 'the Director General to review thoroughly the activities and programmes of the Agency with a view to strengthening the Agency's work relevant to preventing acts of terrorism'. In a 30 November report on 'Protection Against Nuclear Terrorism', Director General Mohamed ElBaradei suggested increased agency efforts, costing an additional US$30–50m per year, to prevent the theft of nuclear and radioactive material, increase security at nuclear installations and improve emergency response.
- On 29 October, the IAEA received a pledge of US$1.2m from the Nuclear Threat Initiative (NTI), a private foundation, to improve nuclear material protection, including improving the agency's ability to review the security of nuclear facilities worldwide, identifying essential security upgrades and organising contributions from member states to carry them out. NTI President Charles Curtis emphasised that international investment in nuclear security is 'grossly inadequate'.
- Meanwhile, the so-called Trilateral Initiative, intended to involve the IAEA in verifying removal of fissile material from US and Russian military programmes, is making little headway. Discussions among the parties on how to overcome the technical hurdles in monitoring sensitive items, such as former nuclear warhead components, are continuing. During the General Conference the three parties reviewed progress and decided to meet again in September 2002 'to oversee implementation of the Trilateral Initiative'. No target date for signing the initiative was set.

Source 'Strengthening the effectiveness and improving the efficiency of the safeguards system and application of the model additional protocol', *IAEA General Conference Resolution,* GC(45)/13, Vienna, adopted 21 September 2001; 'Regular budget appropriations for 2002', *IAEA General Conference Resolution,* GC(45)/RES/5, adopted 21 September 2001; 'Measures to improve the security of nuclear materials and other radioactive materials', *IAEA General Conference Resolution,* GC(45)/RES/14, adopted 21 September 2001; 'IAEA verification of weapon-origin fissile material in the Russian Federation and the United States', *IAEA Press Release,* PR 2001/19, Vienna, 17 September 2001; 'NTI pledges $1.2 million to IAEA for nuclear material protection', *Nuclear Threat Initiative Press Release*, 29 October 2001, www.nti.org; 'IAEA outlines measures to enhance protection against nuclear terrorism', *IAEA Press Release,* PR 2001/26, Vienna, 30 November 2001.

Lost in space: US fudges compliance with satellite launch treaty

According to Jonathan McDowell, an astronomer at the Harvard–Smithsonian Center for Astrophysics in Cambridge, Massachusetts, the US is failing to register correctly the orbits of its satellites, as required of all parties to the 1975 United Nations Convention on the Registration of Objects Launched into Outer Space (Registration Convention). The treaty aims to make information available on the orbits, ownership and purpose of space objects to allow assessments to be made of their potential hazard to other space objects or to the earth. Each state is supposed to maintain its own register of such data and provide timely reports on launches to the UN.

McDowell argues that the bulk of the information provided by the US is deliberately wrong or misleading. For example, the 1989 launch of military satellite 72A was never registered. He found that over 100 US satellites were incorrectly registered, including eight spy satellites. Discrepancies are apparently becoming more pronounced: of the 10 launches the US registered during 1999 and 2000 only two were listed with correct final orbits.

The UN Office for Outer Space Affairs confirmed that the Pentagon's data are incorrect but said that it cannot do anything about it. The treaty does not specify a reporting deadline and there is debate about whether it requires states to register final orbits. A spokesman for the US Space Command contends that 'the US is in full compliance with the convention', arguing that the treaty permits each nation to determine 'the content of each registry and the conditions under which it is maintained'. McDowell asserts that 'to cheat on the convention in

really obvious ways and then pretend we're in compliance makes us look silly and undermines confidence in our honesty'.

Other states in non-compliance include China, Germany and Japan, while Russia is believed to be in full compliance. Despite the fact that satellites are relatively easy to track, with amateur trackers posting orbit data on the internet, demonstrating treaty compliance should be a priority for states parties.

Source 'Missing in action', *New Scientist,* 11 August 2001, p. 11; 'Weltpolizist ohne Nummernschild', *Der Spiegel,* 3 September 2001; Jonathan McDowell, Statement on United States Non-Compliance with UNR1721B, available at www.harvard.edu.

Afghan imagery buy-up foiled

The US National Imagery and Mapping Agency has bought all the rights to existing and future photos taken by the privately-operated Ikonos high-resolution imaging satellite to prevent them being used to track and target US troops in Afghanistan. The US military does not need the Ikonos images for its own purposes, as it has four Keyhole satellites, with sensor resolution of 10 centimetres. The Pentagon does have the legal authority, known as shutter control, to prevent civilian satellites launched from US soil from selling images while it is at war. By agreeing to buy the Ikonos images the authorities have sidestepped the backlash that could have ensued from implementing these powers. However, they have no control over satellites launched from other countries. Israeli-owned ImageSat, which operates the Eros high-resolution satellite, now faces little commercial competition for its images of Afghanistan.

Source David Whitehouse, 'US buys Afghan image rights', BBC news, 17 October 2001, available at www.bbc.co.uk; Barbara Opall Rome, 'Israeli sat venture reaps rewards for war imagery', *Defense News*, 22–28 October 2001, p. 3.

START I done . . .

On 5 December 2001 the US and Russia completed reductions in their strategic nuclear arsenals, from over 10,000 accountable warheads each to 6,000 each, as required by START I. Belarus, Kazakhstan and Ukraine have also completely eliminated the nuclear weapons left on their territory after the collapse of the Soviet Union. On 24 August 2001 the last 450 US Minuteman missile silos earmarked for destruction under the agreement were destroyed. The detonation of explosives turns the silos into 90-foot craters, which are then filled with rubble, capped and left for 90 days to allow Russian satellites to verify their elimination. START I is currently the only treaty under which agreed cuts in strategic offensive weapons are being made, as START II, signed in 1993, has not yet entered into force.

Source Jon Wolfsthal 'The START I milestone: what does it mean to the United States?', *Carnegie Analysis,* 7 December 2001, www.ceip.org; US Department of State, Office of the Spokesman, Statement by the Secretary of State Colin Powell on the achievement of the final reductions under the START Treaty', 5 December 2001, www.usinfo.state.gov; 'Last of 450 missile silos destroyed under pact', *Russian–American Security Advisory Council News*, 30 August 2001; Statement by Ministry of Foreign Affairs of the Russian Federation on the Occasion of the Tenth Anniversary of the Signing of the START Treaty, Conference on Disarmament, Geneva, 31 July 2001, CD document CD/1648, 31 July 2001.

. . . further 'verification-free' cuts mooted

At a summit meeting in Crawford, Texas, on 13 November 2001 between US President George W. Bush and Russian President Vladimir Putin, the former announced that the US intended to reduce its deployed strategic nuclear weapons from the present level of 6,000 to 1,700–2,500 within 10 years. Putin promised that Russia would 'respond in kind'. The cuts would be below the 2,000–2,500 range of START II, but only 300 less than the numbers envisaged in the 1997 agreed START III framework. Details of how and whether the agreement will be codified in a treaty are still to be determined. Bush argued that 'the endless hours of arms control discussions' which led to the START treaties were not needed as the US and Russia now have 'a new relationship based on trust'. He reported that, 'I looked the man in the eye and shook his hand'. But Putin insisted that it was 'important to rely on the existing foundation of treaties and agreements in the arms control and disarmament areas'. 'We are prepared', Putin said, 'to present all our agreements in treaty form, including the issues of verification and control'. Bush was forced to concede: 'If we need to write it down on a piece of paper, I'll be glad to do it'. The administration caused further concern by intimating that it envisaged simply storing rather than destroying the warheads.

No sooner was the summit over than the Bush administration gave notice, on 13 December, that it would withdraw from the ABM treaty. The administration sees the bilateral agreement as 'a relic of the cold war' that stands in the way of testing its proposed national missile defence system. US withdrawal, which will take effect in June 2002, comes despite the fact that Putin said publicly that he was prepared to modify the treaty. Many observers see the ABM agreement as the cornerstone of strategic stability and arms control.

Source Daryl Kimball, 'Fuzzy nuclear math', *Arms Control Today,* December 2001, p. 2; Phillipp Bleek, 'Bush, Putin pledge nuclear cuts; implementation unclear', *Arms Control Today,* December 2001, pp. 19, 24; Karl Inderfurth, 'Trust, but verify—in writing', *Boston Globe*, 5 December 2001; Megan Twohey, 'Putin says Russia was ready to alter ABM', *Moscow Times,* 18 December 2001.

Science & Technology Scan

Afghan war spurs imaging developments

The war in Afghanistan is fuelling adaptation and improvement of imaging and sensor technologies that, in time, may also improve verification techniques. The US has, for instance, deployed the new unmanned aerial surveillance aircraft, Global Hawk, which is designed to fly for 24 hours at a height of up to 60,000 feet. In addition to optical/photographic equipment and infrared imaging, the Global Hawk uses Synthetic Aperture Radar, which provides images almost identical to aerial photographs. When combined with infrared images, they can provide detailed information that could be used in many verification scenarios. The US has further developed its Light Detection And Ranging (Lidar) detectors, a laser version of radar. By transmitting light and comparing how it is reflected back from objects, it can create accurate images. Its sensitivity is such that, potentially, it can detect exhaled breath. Lidar could prove a powerful verification technology for monitoring demilitarised zones and peace agreements.

In addition, the US military is mounting infrared thermal imaging systems on C-130 Hercules and unmanned aircraft to detect heat-emitting objects, including humans, up to 30 miles away. Miniature, less powerful versions have also been developed that can be held in the hand. Magnetic surveying, used for locating objects that generate magnetic fields, is also being used. This technique could be adapted for finding unexploded bombs and mines. Detecting buried munitions or mapping possible test sites could also be achieved using ground-penetrating radar, which is currently being used in Afghanistan to search for caves. Microgravity surveying, which detects tiny fluctuations in the earth's gravitational field, is another method being used to locate underground holes and chambers, a technology of relevance to verifying compliance with the ban on underground nuclear tests.

Source 'Sensors that can pierce rock hunt down bin Laden', *Independent,* 23 November 2001, p. 6. See also 'Trapping Bin Laden' at news.bbc.co.uk.

Creepy crawly robots . . .

A new robotic caterpillar was unveiled in November by Norihiko Saga of Akita Prefectural University in Japan. Just a few centimetres wide, it can burrow its way through rubble using a magnetic propelling mechanism similar to the rhythmic contractions that humans use to move food along their intestines. The caterpillar can cover four centimetres per second. Saga plans to automate this motion by integrating a series of electromagnets into the mechanism. This will allow the robot to be operated by remote control. Future applications include carrying chemical and biological sensors and radiation detectors into inaccessible areas to facilitate verification of the Chemical and Biological Weapons Conventions and the CTBT. This type of portable technology has the potential to reduce the costs of such missions dramatically.

Source 'Wriggle into rubble', *New Scientist,* 10 November 2001, p. 22.

. . . and robots that work in packs

The US air force is considering developing robotic armies to provide continuous monitoring of battlefields under their Revolutionary Technology programme. The system, envisioned for 10–20 years hence, would consist of a suite of automated vehicles with cheap, low-quality sensors that would be capable of high performance when operating together. To achieve this co-ordination, the laboratory is exploring new technologies to process intelligence, surveillance and reconnaissance data in real time. The research group is also looking at more energy efficient methods for propulsion and new ways of powering these vehicles, in order to extend their lifetimes. Robotic armies could have future applications in monitoring demilitarised zones, borders and ceasefires. This would be particularly useful where large area coverage is needed, as in Iraq. Armed with the right sensors, they could also be sent on to battlefields to verify the presence or use of biological, chemical or radiological weapons. The enormous resources being expended on projects like this will inevitably result in developments in intelligent systems, sensor and navigational technologies, which will, in time, provide new verification possibilities.

Source 'USAF explores loitering robots for attach roles', *Jane's Defence Weekly,* 12 September 2001, p. 16.

Mini gas sensors

Identifying the presence of a gas can often require the detection of a number of its constituent chemicals using different sensors. Research by the Physical Electronics Laboratory in Zurich, Switzerland, has led to the design of an integrated detection chip, the size of a shirt button, to recognise the chemical patterns of gases. This pattern recognition is based on three different

Peace Missions Monitor

OSCE's Macedonia mission grows

Following the North Atlantic Treaty Organisation (NATO)'s successful September 2001 mission to collect weapons from the ethnic Albanian rebel National Liberation Army in the former Yugoslav Republic of Macedonia—Operation Essential Harvest—the OSCE has expanded its Spillover Monitoring Mission to Skopje. Numbering more than 200 personnel, the mission now includes 'confidence-building monitors', police advisors, police trainers and support staff. It is mandated to contribute to the maintenance of peace and security in the country, as well as to build confidence among the population by reporting regularly on: the security situation in the northern border areas with Serbia; illicit arms trafficking; the humanitarian situation, including the return of refugees and internally displaced persons and human trafficking; the situation in sensitive regions; and any incidents or recurrence of hostilities. The mandate has been extended to 30 June 2002.

Source *OSCE Newsletter,* vol. VIII, no. 9, October 2001, p. 4, www.osce.org.

Historic IRA first: verified decommissioning

On 24 October the Irish Republican Army (IRA) announced that it had undertaken an act of verified decommissioning, the first ever in Irish history. The head of the Independent International Commission on Decommissioning, Canadian General John de Chastelain, later confirmed the announcement. The Commission reported that the decommissioned material included arms, ammunition and explosives, which had been put 'completely beyond use' in accordance with a scheme agreed with the IRA in August and the regulations promulgated by the British parliament for verified decommissioning. But the Commission gave no further details, on the grounds that this would hinder further decommissioning moves. It was not clear precisely how much weaponry was involved, whether it is the same material that international observers previously verified as having remained unused in secure storage, or whether there would be further decommissioning steps. Loyalist paramilitaries warned that they would not be reciprocating.

Source David Lister and Philip Webster, 'Peace gets another chance', *The Times,* 24 October 2001, p. 1; David McKittrick, 'IRA begins to lay down its arms', *Independent,* 24 October 2001, p. 1. For IRA and Commission statements see www.bbc.co.uk.

Solomon Islands mission incomplete

Elections for a new government in the Solomon Islands were held on 5 December 2001 in an attempt to restore democracy after three years of ethnic conflict. International observers from the Commonwealth, deployed throughout the islands reported no evidence of voter intimidation or violence. On 17 December Sir Allan Kemakeza, leader of the People's Party, was elected prime minister. An International Peace Monitoring Team (see *Trust & Verify*, September–October 2001) failed to fulfil its mandate to disarm rebel forces completely before the elections. More than 500 high-powered weapons reportedly remain unaccounted for.

Source BBC news online, 5 and 17 December 2001, www.news.bbc.co.uk.

types of sensor. The first uses a microscopic silicon springboard that vibrates when the gas molecules hit it, providing a measurement of their mass, in much the same way as the bend in a diving board can reveal the weight of a diver. The second sensor checks the energy of the molecules, or how fast they are moving, by catching them in an absorbing material and measuring the change in temperature. The third sensor measures the electric charge of the gas by storing the gas molecules between a pair of tiny metal plates. The signals from these detectors are combined to identify the gas. The small size and electronic compatibility of this chip will have a range of applications, including environmental monitoring of gas emissions from factories and power stations.

Source 'Smart single-chip gas sensor microsystem', *Nature,* 15 November 2001, vol. 414, p. 293.

UAVs go batty

Engineers at a company called AeroVironment have created an unmanned aerial vehicle (UAV) that they have dubbed the 'microbat'. It is eight inches long and uses a pair of flapping wings to stay aloft. Guided by remote control, the microbat can travel up to a mile carrying specially miniaturised sensors and detectors. Live images can be downloaded from the sugar cube sized video camera on board. Currently, the microbat is not reusable and is, therefore, expensive. However, its advantage is its size, which makes it hard to detect and shoot down. In the future, UAVs, like the microbat, which are portable and easily deployed, could prove to be highly adaptable verification aids.

Source 'Holy UAVs, Batman', *Bulletin of the Atomic Scientists*, September/October 2001, p. 9.

VERTIC News & Events

VERTIC verification panel at CTBT Article XIV Conference

In co-operation with the governments of Australia, Canada and Sweden, VERTIC hosted a seminar on *Verifying the CTBT: Capabilities, Progress and Challenges* at UN headquarters in New York on 12 November 2001. The seminar, which coincided with the CTBT Article XIV Conference, had been postponed after the events of 11 September. Attended by about 70 delegates, UN personnel and non-governmental organisations (NGOs), the meeting began with a word of welcome by Jayantha Dhanapala, UN Under Secretary-General for Disarmament Affairs. This was followed by opening statements by Swedish Foreign Minister Anna Lindh, Canadian Foreign Minister John Manley and the Permanent Representative of Australia to the UN, John Dauth. The seminar featured a distinguished panel of experts who spoke on several aspects of CTBT verification. Dr Gerardo Suarez, Director of the International Monitoring System (IMS) Division of the CTBTO's Provisional Technical Secretariat in Vienna, detailed the progress of the IMS and the challenges it faces. Scientific monitoring and CTBT verifiability were covered by Dr Lynn Sykes, Higgins Professor of Earth and Environmental Sciences at the Lamont-Doherty Earth Observatory at Columbia University. Finally, Dr Edward Levine, Senior Professional Staff Member for the US Senate Committee on Foreign Relations, tackled the subject of national technical means, US policy and the future of the CTBT. The event was chaired by Trevor Findlay, VERTIC's Executive Director.

Verification Yearbook 2001 launched

VERTIC launched its *Verification Yearbook 2001* on 13 December. The *Yearbook* provides concise analysis of verification developments in 2001, and anticipates future issues and trends in monitoring, verification and compliance. The 12-chapter volume has a foreword by Dr Mohammed ElBaradei, Director General of the IAEA, and contains contributions by VERTIC staff and commissioned authors. The launch, attended by about 30 invited guests, was held at the Hatton Conference Centre in London, and was combined with the VERTIC Christmas party. The *Verification Yearbook 2001* may be ordered online at www.vertic.org or using the enclosed flyer. Individual chapters can be downloaded free in PDF format from VERTIC's website from February 2002.

New Verification Matters series launched

VERTIC has also re-launched its research report series under the title Verification Matters. Published in a more readable format, with a new design, the reports are in-depth studies of particular verification topics. The first two reports, now available, are *Chemical Weapons Inspections under the Chemical Weapons Convention* by John Hart (no. 1), and *The Biological Weapons Convention Protocol: Politics, Science and Industry* by Henrietta Wilson (no. 2). Verification Matters, priced £10, may be ordered at www.vertic.org or direct from VERTIC.

Verification and Compliance Handbook review panel meeting

On 23 November VERTIC held a meeting of experts on arms control and the Middle East to review a draft of the *Handbook on Verification and Compliance,* which is to be published jointly by VERTIC and the United Nations Institute for Disarmament Research (UNIDIR). The *Handbook* is a compendium of verification terms, methods and technologies designed to assist negotiators of any future arms control agreements in the Middle East and may also be used for training purposes. The meeting was held to elicit comments and suggestions on the language, content, clarity and coherence of the text and its usefulness and appropriateness in the Middle East context. Dr Jane Boulden, Research Fellow at the Centre for International Studies, University of Oxford, is principal author of the work. John Russell, VERTIC's Arms Control and Disarmament Research Assistant, has been assisting with writing and research. The Review Panel comprised Dr Gershon Baskin, Co-Director of the Israel/Palestine Center for Research and Information, Jerusalem; Professor Anoush Ehteshami, Director of the Institute for Middle Eastern and Islamic Studies, University of Durham, UK; and Emily Landau, Director of the Arms Control Regional and Security Project at the Jaffee Center for Strategic Studies, Tel Aviv University, Israel. Dr Patricia Lewis, Director of UNIDIR, Steve Tulliu, UNIDIR Project Editor, Jane Boulden and VERTIC staff also attended the meeting. After revisions and further consultations the book will be published later this year in English and Arabic.

Staff news

VERTIC staff were involved in the following activities from September 2001 to the end of 2001.

TREVOR FINDLAY, along with Angela Woodward, represented VERTIC at the Third Meeting of States Parties to the Landmine Convention in Managua, Nicaragua, from 18–21 September. On 1 and 2 October, together with Molly Anderson, he attended a conference on the Kyoto Protocol at the Royal Institute of International Affairs (RIIA) in London, and on 5 October he participated in the semi-annual meeting of the Mountbatten Centre for International Studies and Foreign and Commonwealth Office (FCO) Non-Proliferation Study Group at the FCO. On 1 November Trevor presented a paper co-authored with Oliver Meier on 'Exploiting synergies between nonproliferation verification regimes: a pragmatic approach' to the IAEA's Symposium on International Safeguards in Vienna from 29 October to 2 November. From 12–14 November he represented VERTIC at the CTBT Article XIV Conference in New York and chaired VERTIC's verification panel on 12 November. He also attended breakfast meetings for NGOs held by Japanese Ambassador Nobuyasu Abe and Canadian Ambassador Jill Sinclair and had funding discussions with VERTIC's fundraising advisor Hilary Palmer and with the Carnegie Corporation of New York. On 23 November he chaired the VERTIC/UNIDIR Panel Meeting on the draft *Handbook on Verification and Compliance* at the Hatton Centre in London. He participated in a one-day training course on staff assessments at the Directory of Social Change in London on 26 November.

From 1–2 December Trevor participated in a workshop at Harvard University on the proposed annual UN *Human Security Report,* where he gave a presentation on VERTIC's experience in producing its *Verification Yearbook.* The following week, in Lima, Peru, he attended the IAEA Regional Seminar on the Additional Protocol from 4–6 December, where he presented a paper on 'Verification at low/zero levels of nuclear weapons: what will it take?'. During the reporting period, along with Oliver Meier, he completed editing VERTIC's *Verification Yearbook 2001* and the first two numbers of VERTIC's new Verification Matters series.

MOLLY ANDERSON attended a meeting of the new Climate Change Exchange on 19 September at the Science Museum in London. From 27–28 September she participated in the Climate Network Europe (CNE) strategy session and prepared the Climate Action Network (CAN) position for COP7 on Articles 5, 7 and 8. Molly was invited to represent CAN at an informal workshop on Articles 5, 7 and 8 in Bonn, Germany, from 4–6 October. In preparation for COP7, she produced a VERTIC *Briefing Paper* on the key issues for the conference and accom-

panied members of CAN-UK to a meeting with the UK delegation on 15 October. She also attended COP7 in Marrakech, Morocco, from 28 October–9 November, where she co-ordinated the CAN working group on Articles 5, 7 and 8. On her return, she prepared a CAN summary of the conference relating to Articles 5, 7 and 8. She also attended a COP7 debriefing, organised by the RIIA in London on 29 November and a conference at the Royal Society, London, on 12–13 December, entitled 'Climate change: what we know and what we need to know'. Finally, she attended a debriefing session at the RIIA on 14 December on the World Trade Organization talks held earlier that month in Doha, Qatar.

BEN HANDLEY has been preparing financial reports and budgets for funders, and has overseen the installation of new high-speed internet access for VERTIC.

OLIVER MEIER attended an NGO meeting at University College London on 20 September to discuss BWC issues. On 1 and 2 October respectively, Deutschland Radio Berlin and Norddeutscher Rundfunk interviewed Oliver on BW issues. From 8–9 October he participated in a workshop on 'International technology control' at the German Council on Foreign Relations in Berlin, where he presented a paper on 'New verification concepts', which will be published in the workshop proceedings. From 19–23 November, he attended the opening of the fifth BWC Review Conference in Geneva. He presented VERTIC's statement to the plenary session of the conference on 21 November and spoke at a seminar of NGOs and EU delegations on 23 November. During the conference Oliver published an article on BW control on the internet news site *Netzeitung.de.* From 24–25 November he attended the sixteenth workshop of the Pugwash Study Group on the Implementation of the Chemical and Biological Weapons Conventions, also in Geneva. On 6 December he had a letter to the editor on US BW policy published in the *International Herald Tribune.* As a result of the failure of the BWC Review Conference he gave interviews on several German radio stations and BBC World Service Europe. Oliver was quoted in *The Financial Times* and *New Scientist,* as well as by Reuters and the UN Global Security Newswire. He helped draft a VERTIC/British American Security Information Centre (BASIC) press release on the last day of the Review Conference, as well as a VERTIC press release on its failure.

MIRAK RAHEEM joined VERTIC as an intern in December. Originally from Sri Lanka, he is a graduate in international relations from the London School of Economics and Political Science. His duties at VERTIC include researching the monitoring role of the Temporary International Presence in Hebron, and undertaking general administrative tasks.

JOHN RUSSELL continued working with Jane Boulden on the *Handbook on Verification and Compliance,* including organising the panel meeting in London on 23 November. He has also been preparing an electronic version of the *Handbook.* Additionally, he helped with preparations for the *Verification Year-*

verification brief

- Zimbabwe is continuing to reject both local and international monitoring of its presidential election scheduled for March 2002. For the parliamentary elections in 2001 an independent body trained 24,000 monitors from a range of civic organisations. Zimbabwe now risks suspension from the Commonwealth and the imposition of EU sanctions. *The Guardian,* 4 January 2002.
- Uganda and Rwanda have posted military observers to their respective capitals, Kampala and Kigali, as part of diplomatic efforts to resolve misunderstandings; the observers will work with joint verification committees established by the two countries. *Jane's Defence Weekly*, 28 November 2001, p. 17.
- Levy Mwanawasa was sworn in as Zambia's new president despite serious concerns about the fairness of the general elections in December raised by independent election monitors. The new president said that any protest against the election result would be regarded as treason. *Time,* 14 January 2002.
- The United Nations Interim Force in Lebanon (UNIFIL), which has been deployed since 1978, is to become a 2,000-strong armed observer mission along the UN-delineated Blue Line which separates Israel and Lebanon; the reduction and restructuring of the force became possible after Israel withdrew from south Lebanon in May 2000. *Jane's Defence Weekly*, 21 November 2001, p. 16.

book 2001 launch on 13 December. John met with Helen Hughes of the United Nations Association (UNA) of the UK on 4 December to discuss possible co-operation.

THOMAS WITHINGTON co-ordinated the distribution of the first two numbers of VERTIC's new Verification Matters series, as well as formatting and organising the publication and distribution of VERTIC *Briefing Paper* 01/05. In addition, he helped to organise the *Verification and Compliance Handbook* panel meeting on 23 November and the combined *Verification Yearbook 2001* launch and VERTIC Christmas party on 13 December. Thomas' contract with VERTIC ended just before Christmas. VERTIC is grateful for his contribution and wishes him well in his new endeavours.

ANGELA WOODWARD contributed a chapter to the *Verification Yearbook 2001* on the Landmine Convention and has been developing new funding proposals for VERTIC's landmine project. On 23 October, along with Trevor Findlay, she attended a working lunch with Paul Ellis and Peter Balmer of the UK Ministry of Defence to discuss landmine issues. Angela participated in meetings of the Landmine Action network of NGOs on 1 November and 6 December. She also represented VERTIC at the All-Parliamentary Landmines Eradication Group meeting at the House of Commons on 20 November and the Peaceworkers UK meeting on 'Contributing civilian personnel to peace operations' on 21 November. Angela also participated in the panel meeting on the *Handbook on Verification and Compliance* on 23 November.

VERTIC

VERTIC is the Verification Research, Training and Information Centre, an independent, non-profit making, non-governmental organisation. 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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