

A-PDF MERGER DEMO

Monitoring governments' deforestation commitments

More 'track two' verification

ALARMED AT THE RAPID DISAPPEARANCE of the world's forests and the extent of illegal logging operations, a group of non-governmental organisations (NGOs) and indigenous peoples organisations (IPOS) has launched the latest co-ordinated civil society effort to monitor systematic implementation of international commitments by governments. The initiative echoes that of Landmine Monitor, which was set up in 1998 to track whether states parties had met their obligations under the 1997 Landmine Convention.

At the third session of the UN Intergovernmental Forum on Forests (IFF) in May 1999, 18 NGOs and IPOS committed themselves to monitoring and reviewing implementation of the Proposals for Action to tackle deforestation—agreed by the Intergovernmental Panel on Forestry (IPF) and adopted at the nineteenth UN General Assembly Special Session in June 1997. Although the 100-odd Proposals are not legally binding and fail to address some of the underlying causes of deforestation, their implementation would be an important step towards halting the global crisis.

To manage the monitoring exercise, a broad-based Steering Committee, representing eight geographic regions, was established in July 1999. It worked with regional co-ordinators to select country researchers and to provide them with knowledge of the IPF-IFF process and of the people working on national forest issues. The Committee was also responsible for designing a framework questionnaire for collecting data and collating conclusions and recommendations based on the researchers' reports. Twenty-two countries from all regions were assessed: the focus was on those nations that play a prominent role in the policy debate, have significant forest coverage, and maintain high levels of timber imports or exports. The questionnaire was distributed to, and discussed with, governments through the country researchers. It examined seven basic aspects of compliance: process; participation; transparency; gap analysis; prioritisation; concrete action; and co-ordination.

Other national NGOs, IPOS and academics were identified and invited to contribute to the report. A draft version was distributed at the IFF's fourth and final session in January-February 2000 and at a meeting of the Steering Committee, which was convened to initiate a second phase of review and comment. Over this period and for a subsequent four to six weeks, comments and suggestions were received from governments and peer reviewers and incorporated into the final contributions of the country researchers.

The report—*Keeping the Promise: An Independent Review of the Implementation of the IPF Proposals for Action*—was released in May 2000 (see www.forestpolicy.org). It found that little progress had been made in implementing the Proposals for Action and that forest destruction was continuing at an unprecedented rate. In addition only a small number of countries had established a process for implementing the Proposals, few had provided the substantive report on progress, as required by the UN Commission on Sustainable Development (CSD), national

Also in this issue . . .

Clare Tenner on climate change and verification, book reviews on nuclear testing and commercial satellite imaging by Oliver Meier, plus Verification Watch, Science and Technology Scan, Verification Quotes, and VERTIC news and events. See the back page for information on the forthcoming *Verification Yearbook 2000*.

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Countries in the deforestation study

Australia

Brazil

Cameroon

Canada

Chile

China¹

Colombia

Costa Rica

Ecuador

Finland

France¹

Germany

Ghana

India¹

Indonesia

Japan

Malaysia¹

New Zealand

Peru¹

Russia

UK

US

¹ reviews not completed

policies and programmes had rarely been reviewed, and some parties that might have been responsible for implementation were unaware of the existence of the Proposals for Action.

Some of the reasons given by governments for lack of compliance were that: the reporting structures were weak; the Proposals for Action were vague and did not provide a clear framework for implementation; the Proposals were not legally binding; and implementation was not the sole responsibility of governments, but also of NGOs, the private sector and international institutions.

The study itself concluded that the absence of implementation was due to the vagueness of the Proposals for Action and lack of political will.

Despite these disappointing findings, clear benefits accrued from conducting the monitoring exercise: selected governments were named and shamed in areas where progress had not been made; in cases where partial implementation had

occurred, states were given the opportunity to explain their problems or successes; NGOs and IPOs were able to draw to the attention of governments the need for compliance; the importance of the participation of NGOs, IPOs and other parties in policy implementation and development was again demonstrated; and more parties became engaged in the process, creating new links between those involved in policy discussion and those taking part in field-level implementation.

An uncertain future

At its final session, the IFF proposed that a new UN Forum on Forests (UNFF) be created to promote implementation of the Proposals for Action. Some NGOs advocated the institutionalisation of independent monitoring in the Forum's work plan, but many governments rejected this. However, it is hoped that, as a result of the first independent monitoring project, a more serious attempt will be made to implement the Proposals for Action. Designing an effective, transparent structure in the UNFF to ensure compliance will be key to achieving this objective.

Meanwhile, the monitoring project's Steering Committee has reorganised itself into a loose network of NGOs—the Global Forest Coalition. The Coalition intends to organise a second phase of monitoring implementation of the Proposals. But this depends on securing funding. For the moment, therefore, the future of the independent process remains uncertain.

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The Kyoto Protocol: sinking fast?

WHILE THE EU WAS BUSY IN LYON in September (see article opposite) attempting to strengthen the role of domestic policies and measures in reducing greenhouse gas emissions, other parties were negotiating means to avoid them. In particular, several developed countries pushed hard for the full inclusion of biological 'sinks' in the Kyoto Protocol. This would allow them to take credit for natural systems, such as vegetation and soil, which absorb greenhouse gases, thereby avoiding the need to reduce emissions from source. The Protocol does allow parties to use 'human-induced' land-use change and forestry (LUCF) activities that store gases to increase their emissions allowances. But this is subject to them being 'measured as verifiable changes in carbon stocks' and 'reported in a transparent and verifiable manner'. Environmental groups have always maintained this would be difficult.

Now researchers from the International Institute for Advanced Systems Analysis (IIASA) in Austria have stated publicly that full inclusion of sinks activities in the Protocol would make it 'completely unverifiable' and a 'cheat's charter'. The comments were based on analysis of a full carbon account constructed for Russia in 1990 and for three scenarios in 2010. Available methods for calculating the uncertainties associated with the estimates for each component of the account revealed that changes in the carbon balance between 1990 and 2010 were small in relation to the accounting uncertainties resulting from huge gaps in our knowledge of carbon fluxes between the biosphere and atmosphere. The project team does not consider these problems to be unique to Russia, as a parallel project for Austria produced the same outcome. The team concludes that the uncertainties will 'generate severe problems in verifying the implementation of the Kyoto Protocol'.

Source Fred Pearce, 'Smokescreen exposed', *New Scientist*, 26 August 2000, p.18; Sten Nilsson, Anatoly Shvidenko, Vladimir Stolbovoi, Michael Gluck, Mattias Jonas and Michael Obersteiner, 'Full Carbon Account for Russia', *Interim Report IR-00-021*, International Institute for Advanced Systems Analysis, Laxenburg, Austria, 22 August 2000 (Executive Summary).

Climate change: crunch time for verification decisions

IN PREPARATION FOR THE Sixth Conference of the Parties (COP6), the states parties to the 1992 UN Framework Convention on Climate Change (UNFCCC) have continued to work intensively over the past few months. The meeting, which will take place in The Hague, Netherlands, in November 2000, is expected to finalise the details of the 1997 Kyoto Protocol and to facilitate its ratification and entry into force over the next couple of years.

In the run-up to COP6, work on the Protocol's verification system concentrated on developing guidelines for the annual reporting and review of national greenhouse gas emission inventories. These guidelines will provide the data to assess compliance by developed countries with their emissions reduction commitments.

Although this work is essential, emissions inventories should not be the sole focus of the verification system. Emissions reduction obligations under the Protocol are set for five-year 'commitment periods'. The first phase runs from 2008–12, meaning that it will not be possible to assess formally compliance with Kyoto targets until the annual inventories for 2012 have been submitted and reviewed—in approximately 2015.

Article 3.2 of the Protocol, however, states that each Annex 1 party (developed countries) must have made 'demonstrable progress in achieving its commitments' by 2005. This provides an early opportunity for Annex 1 states to share among themselves and with developing countries, the business world and civil society, details of the initiatives they are pursuing to meet their Kyoto commitments. If developed properly, this provision could build confidence in the regime by providing assurances that all Annex 1 parties are taking action to cut greenhouse gas emissions. This will be important, given the perceived economic costs of introducing emissions reductions.

In order to implement Article 3.2, parties need to define 'demonstrable progress' and to consider what information should be reported in 2005. Credit is due to the European Union (EU), which pushed hard on this issue at preparatory talks for COP6 in Lyon, France, from 4–15 September 2000.

Given that parties do not have emissions targets for 2005, it would be difficult to base a review solely on greenhouse gas emissions inventories. Even if these showed a rising emissions trend (as is likely), this could not be taken as evidence that a party will not meet its reduction target for the first commitment period. A second approach would be to examine

the policies and measures that a party has taken to achieve reductions. This was the method promoted by the EU in Lyon.

The EU recommended that a consultative process on policies and measures be established, *inter alia*, to identify information needed to facilitate the assessment of demonstrable progress. It suggested that reporting on demonstrable progress 'be done through a comparable and transparent methodology', using 'criteria and quantitative parameters' to measure advances since 1990. But the EU stressed that the objective would not be to compare the performance of different parties and that demonstration of progress would not be a compliance issue.

Other developed countries did not share the EU's vision. The US suggested that information on the institutional and legal steps that a party has taken to prepare itself to meet emissions reductions would be enough to show demonstrable progress. These would include, for example, the setting up of national systems to estimate emissions. Other developed countries were also strongly opposed to any meaningful process for assessing policies and measures. As a result, all useful references to demonstrable progress were deleted from the text on the consultative process, and proposed actions aimed at improving transparency, effectiveness and comparability of policies and measures were bracketed. A further twist came when Saudi Arabia insisted that the Organization of Petroleum Exporting Countries (OPEC) should play a part in any future process of assessing policies and measures.

The draft reporting guidelines negotiated in Lyon do include a section on reporting on demonstrable progress. This was also bracketed, though, as a result of the dispute over the need for data supplemental to a regular national communication. The EU's proposal that parties provide views on demonstrable progress by April 2001 to facilitate a decision on relevant reporting requirements at COP7 was retained in brackets in the draft decision for COP6. The fate of 'demonstrable progress' could well be decided in the few short weeks between now and the last night of negotiations in The Hague. VERTIC will be working hard to persuade developed and developing countries of its benefits before it is too late.

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Book reviews

Nuclear tests and commercial satellites: all you want to know but are afraid to ask

Catalog on Worldwide Nuclear Testing

Editor-in-Chief, V.N. Mikhailov

Published by Begell-Atom, LLC, 1999

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Orders via www.begellhouse.com

Between 16 July 1945, when the US conducted the world's first nuclear explosion, and 29 July 1996, when China carried out an underground nuclear test at its Lop Nor test site, the five nuclear weapon states detonated 2,049 nuclear devices. The 'universal catalog' contains information on all these events, as well as on the Indian and Pakistani nuclear tests of May 1998. Consequently, this is the first comprehensive overview of nuclear testing since the Comprehensive Nuclear Test Ban Treaty, banning nuclear tests in all environments, was opened for signature in 1996. The study was done by a group of experts from the Russian Ministry for Atomic Energy, using official and unofficial 'highly regarded' sources.

The result is a volume that offers little in the way of analysis, but much in terms of data. In a five-page summary the authors present their information in an historical perspective. Tables containing the key characteristics of the five declared nuclear weapon states' testing programmes supplement this summary. Where appropriate, the authors have included brief comments on a particular explosion. The table listing the 2,049 explosions is, in itself, a fantastic resource. But the real added value comes in the following chapters, where the raw data are compiled into different categories. Sixteen tables illustrate the unbelievable scale of the nuclear testing enterprise. This is depicted under such dry headings as 'Total yield by year and state', which reveal that, in 1962 alone, the aggregate yield of US tests exceeded 37 megatons and that the cumulative yield of all Soviet explosions was more than 285 megatons. Nuclear explosions are listed by test site, showing that the combined yield of all atmospheric nuclear tests in French Polynesia, for example, was around 170 megatons.

Even though the study is written for scientists and arms control specialists, this part of the book is essential for general consideration of the nuclear testing issue. This impression is underlined by a listing of so-called US nuclear testing 'operations', which includes the number of military staff who participated in exercises around these tests. Unfortunately, the sloppy editing is apparent by page 3, where a table containing information on Soviet tests is wrongly labelled. Despite its horrendous price, this study is an essential research tool for anybody working on nuclear testing. One hopes an update will never be necessary.

Secrets for Sale: How Commercial Satellite Imagery Will Change the World

Yahya A. Dehqabzada and Ann M. Florini

The Carnegie Endowment for International Peace

Washington, DC, March 2000

There is little doubt that the availability of high-quality commercial satellite imagery will have a profound impact on most areas of international politics. Nonetheless there is a great deal of confusion about what exactly is happening, what the implications might be, and what to do about them. This concise and comprehensive study helps to answer these questions. Yahya Dehqabzada, a researcher working on satellite questions at the RAND Corporation, and Ann Florini, a leading expert on the issue at the Carnegie Endowment for International Peace, cover the most important aspects in only 44 pages.

They describe the application of remote sensing capabilities in the security, humanitarian and environmental fields, as well as in the media and business sectors, and the growth of the commercial remote sensing industry. The drawbacks of commercial satellite imaging are also considered, highlighting the often-overlooked fact that transparency has both positive and negative consequences.

The study concludes that it is futile to attempt to control or even to prevent the growth in transparency resulting from increased use of commercial satellite imagery. The authors argue convincingly that the US would be better served by a return to traditional American policies that put emphasis on open skies and freedom of information. For the rest of the world, this new form of transparency will do far more good than harm.

Copies of the report can be obtained from:

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Alternatively, the study can be downloaded from the Carnegie Endowment's website at www.ceip.org.

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UNMOVIC restrained

The UN Monitoring, Verification and Inspection Commission (UNMOVIC) now has a trained inspectorate ready to resume the work of the disbanded UN Special Commission (UNSCOM) on Iraq. However, China, France, Russia and the US reportedly persuaded UNMOVIC chairman Hans Blix to cancel a scheduled August announcement that his organisation was prepared to begin its mission. Language in a 31 August UNMOVIC report to the UN Security Council was modified to make its operational status more ambiguous. One Security Council diplomat was quoted as saying that both Russia and the US agreed that giving the impression that UNMOVIC was ready to fulfil its mandate 'might create a climate of confrontation at an inappropriate time'. Security Council members apparently wished to avoid a diplomatic row that might have affected the Millennium Summit of World Leaders in New York the following month. Most of the 44 UNMOVIC inspectors have since returned to their home countries, but they may be recalled when needed. Another group of inspectors is due to be trained in France from 7 November–8 December 2000.

In September 2000, the Security Council once again discussed the status of Iraq. French Foreign Minister Hubert Védrine issued a surprisingly strong public warning to Baghdad not to expect the lifting of UN sanctions until it agrees to co-operate fully with UNMOVIC. It remains unclear when, or if, UNMOVIC will be able to implement its mandate. Iraq has repeatedly indicated that it will not co-operate with the body.

Meanwhile, a spokeswoman for the *Bundesnachrichtendienst* (BND)—Germany's foreign intelligence agency—claimed, on 25 August, that some 250 technicians are currently working on the Ababil-100 short-range ballistic missile at the Al Mamoun facility (southwest of Baghdad). UN Security Council resolution 687 and other UN resolutions limit the permissible range of Iraqi missiles to 150 kilometres. While the Ababil-100 complies with this constraint, there is evidence that Iraq is also seeking to develop a 3,000 km-range missile.

Source Colum Lynch, 'U.N. arms inspectors back down', *Washington Post*, 31 August 2000, p. A25; Christopher Wren, 'France warns Iraq UN determined on resuming inspections', *International Herald Tribune*, 15 September 2000, p. 8; Howard Schneider, 'Iraq to refuse entry to new group of UN arms monitors', *Washington Post*, 24 August 2000, p. 4; and 'Germany locates Iraqi missile factory', *Jane's Defence Weekly*, vol. 34, no. 9, 30 August 2000, p. 8.

Landmine Monitor 2000 released

The International Campaign to Ban Landmines (ICBL) released the second Landmine Monitor report on 7 September at the Second Conference of States Parties to the Landmine Convention in Geneva, Switzerland. The 1,100-page *Landmine Monitor*

Report 2000: Toward a Mine-Free World provides new details on mine use, production, trade, stockpiling, demining and mine victim assistance in every country of the world from entry into force of the treaty in March 1999 until mid-2000. The report identifies the use of anti-personnel mines in 20 conflicts by 11 governments and at least 30 rebel groups/non-state actors. This includes continued use of anti-personnel mines by one treaty signatory, Angola, and likely use of anti-personnel mines by treaty signatories, Burundi and Sudan. While these three governments have not ratified the Convention, the use of anti-personnel mines by a signatory state can be judged a violation of international law.

VERTIC again contributed to the annual report, providing an annex (prepared by Angela Woodward) on 'The United Nations' Role in Implementing the Compliance Aspects of the Ottawa Convention'. VERTIC's contribution will be published separately as a VERTIC *Briefing Paper* in October.

Source *Landmine Monitor Report 2000: Toward a Mine-Free World*, Human Rights Watch, Washington, DC, 2000. For more information, see www.icbl.org or e-mail media@icbl.org

OSCE calls for international verification of Yugoslav election results

The Chairperson-in-Office of the Organisation for Security and Co-operation in Europe (OSCE), Austrian Foreign Minister Benita Ferrero-Waldner, has called for verification of the 23 September Yugoslav presidential election result by international experts. Ferrero-Waldner cited substantial differences between the figures published by the Yugoslav Federal Election Commission and the findings of non-partisan groups and opposition sources. She offered OSCE assistance in this process.

Source OSCE press release, 29 September 2000, info@osce.org.

US sanctions Japan for whaling non-compliance

The US has imposed unilateral sanctions on Japan, after the country expanded its whale hunting to include sperm and Bryde's whales. The move is in violation of American legislation and international law, such as the 1946 International Convention for the Regulation of Whaling. So far, the sanctions deny Japan fishing rights in US waters, but they may be extended to encompass economic sanctions, too. The International Whaling Commission banned commercial whaling in the mid-1980s. Japan claims that it is hunting whales for scientific purposes, which is allowed by the Commission. The US contends that Japan is only hunting the whales to satisfy the large demand for meat.

Source 'U.S. Decision on Whaling Angers Japan', *International Herald Tribune*, 15 September 2000, p. 8.

Australia rejects human rights inspections

Stung by criticism of its treatment of Aborigines, the Australian government has said it will restrict visits by UN human rights inspectors and review its involvement with the UN Human Rights Commission in Geneva. Earlier this year, the Commission found that mandatory sentencing laws in two Australian jurisdictions discriminated against Aborigines, and it criticised the federal government for failing to overrule such laws. In March, Prime Minister John Howard's government announced that it would conduct a review of the way the UN human rights system works. The Australian moves will complicate efforts by Western governments to convince Burma, China, Iran and other states suspected of human rights violations to accept visits by the Commission.

Source *International Herald Tribune*, 30 August 2000, p. 4; Amin Saikal, 'Australia Wants No Gruff from the United Nations', *International Herald Tribune*, 5 September 2000, p. 8.

CTBT news

On 29 July 2000, the last horizontal tunnel at the former nuclear test site at Semipalatinsk, Kazakhstan, was destroyed with 100 tonnes of granulotol. The explosion ('Omega 3') in the Degelen Mountains was used to test and calibrate stations contributing to the International Monitoring System for the Comprehensive Nuclear Test Ban Treaty (CTBT). It was the third experiment of its kind in Kazakhstan, and the test site's destruction marks the end of a five-year bilateral programme with the US to dismantle its nuclear weapons test infrastructure. One hundred and sixteen atmospheric tests and 491 underground nuclear explosions—more than 80% of all Soviet nuclear tests—were conducted at Semipalatinsk.

As the CTBT reaches the fourth anniversary of its opening for signature, the number of signatures has risen to 160, while 63 states have deposited their instruments of ratification. New Treaty signatories are Guyana, Kiribati, Nauru, Nigeria and Sierra Leone. Kiribati has also ratified the agreement, and Belarus has deposited its instrument of ratification. Cambodia ratified the CTBT on 8 August 2000, but it has not yet deposited its instrument of ratification.

The Provisional Technical Secretariat of the future CTBT Organization (CTBTO) has announced that the seismological and hydroacoustic networks are now 30% operational and that 10% of the infrasound and radionuclide stations are functioning. The Provisional Technical Secretariat (PTS) has certified the first three primary seismic arrays in Canada (Yellowknife), Norway (Hamar) and the US (Mina, Nevada).

From 22–24 August 2000, the Preparatory Committee (PrepCom) for the CTBTO held its twelfth session in Vienna, Austria. Preparation of the Operations Manual for the future on-site inspections regime remains the most problematic area

of its work. The PTS is now taking a more active role in the document's drafting and it is expected that a rolling text, covering 70% of the Manual, should be ready by the end of 2000.

Source 'Letter dated 4 August 2000 from the Permanent Representative of the Republic of Kazakhstan addressed to the Secretary-General of the Conference on Disarmament transmitting the text of the statement by the Ministry of Foreign Affairs concerning the Kazakh–United States Calibrating Experiment 'Omega 3' at the former Semipalatinsk test site', CD/1623, Geneva, 8 August 2000; *Catalog on Worldwide Nuclear Testing* (Editor-in-Chief V.N. Mikhailov), Begell-Atom, LLC, 1999; 'Comprehensive Nuclear-Test-Ban Treaty—Four Years Old', CTBTO PrepCom press release, Vienna, 25 September 2000; 'Cambodia ratifies nuclear test ban treaty', AFP, Phnom Penh, 8 August 2000. The final documents of the twelfth PrepCom can be found at www.ctbto.org.

BASIC recommends stronger NATO role in verification

In its forthcoming report, *NATO's Nuclear Agenda: Recommendations for Action*, the British American Security Information Council (BASIC) argues that the Alliance should resuscitate its 1990 initiative to establish a co-ordination mechanism for arms control verification. BASIC believes that the newly established Weapons of Mass Destruction Centre at NATO headquarters should take the lead in organising its verification policies. The study's authors, Tom McDonald and Dan Plesch, conclude that the Alliance will be in a better position to engage in talks on disarmament, as pledged by member states during the Nuclear Non-Proliferation Treaty Review Conference in April–May 2000, if it starts conducting substantive work on verification now.

In response to a parliamentary question, meanwhile, the UK Ministry of Defence has stated that it allocated £4.2 million to the verification of nuclear arms agreements in fiscal year 1999–2000. Of this, £11.5m was spent on dismantlement of nuclear weapons.

Source *NATO's Nuclear Agenda: Recommendations for Action*, BASIC, London, forthcoming. Highlights can be found at www.basicint.org; *Hansard*, House of Commons, London, 24 July 2000; Ministry of Defence.

Satellite pictures proliferate

A number of non-governmental organisations have made new satellite images available on the Internet.

- The US Center for Defense Information and the Federation of American Scientists (FAS) have acquired satellite imagery of Chinese airfields facing Taiwan.
- The FAS has also released new pictures of Indian and Pakistani nuclear and missile sites and published old Corona and U-2 pictures of the former Soviet biological weapons test site on Vozrozhdenie Island in the Aral Sea. In addition, the organisation has acquired pictures (taken in July 2000) of the Dimona nuclear complex in Israel. Based on these images, the FAS concludes that Israel has probably been able to produce enough plutonium for no more than 200 nuclear weapons, compared to the previous estimate of 400.

- The Institute for Science and International Security in Washington, DC, has published new high-quality satellite imagery of Pakistan's nuclear test site and infrastructure, North Korea's nuclear complex, and the former Iraqi nuclear complex.
- The US military has argued that the commercial availability of high-resolution satellite imagery is far more of a benefit than a threat to US forces. But Navy Vice Admiral Herbert Brown acknowledged that the Department of Defense is developing tools to disable temporarily satellites that spy on US troops.
- The Turkish armed forces are also relying on commercial satellite pictures. Space Imaging of the US, which is operating the IKONOS satellite, has reportedly signed a regional affiliate agreement with the Turkish company, INTA, to provide satellite pictures to the Turkish military. Despite the deal, Turkey is continuing to develop its own national remote sensing satellite, scheduled for launch by 2003.

Source FAS and ISIS websites at www.fas.org and www.isis-online.org; 'Sharper Sat Images No Threat to U.S. Military', *Defense News*, 17 April 2000, p. 2; Robert Lee Hotz, 'Scientists Question Size of Israeli Nuclear Cache', *Los Angeles Times*, 19 August 2000, www.latimes.com; Burak Ege Bekdil and Umit Enginsoy, 'U.S. Satellite Venture Offers Imagery to Turkey's Military', *Defense News*, 11 September 2000, p. 16.

IAEA running on empty but carrying on buoying

According to press reports, the International Atomic Energy Agency (IAEA) may soon have to curtail some of its activities, including nuclear safeguards. This is because the US and other member states are not paying their dues on time. The US contribution makes up around 25% of the Agency's budget, and late payments have already forced the IAEA to use its Diners' Club credit-card overdraft facility to pay staff.

Meanwhile, in co-operation with the Radiological Protection Institute of the Republic of Ireland and the Environment and Heritage Service of Northern Ireland, the IAEA has deployed an experimental buoy in the Irish Sea, capable of continuously measuring the radioactive contamination of seawater. The detector monitors for caesium-137, a radionuclide that is a by-product of nuclear reprocessing, and for nuclear explosions. The buoy is linked via satellite to the Agency's maritime laboratory in Monaco.

Source William Drozdiak, 'Nuclear agency faces financial crisis', *Washington Post*, 8 August 2000, www.msnbc.com; 'Continuous Radiation Monitor for the Irish Sea', *IAEA press release*, PR2000/17, Vienna, 2 August 2000.

Verification Quotes

There is a simple reason why UNSCOM was a success. The success was due to the quality of the people and to the political element. So that is how it worked: the combination of high-quality practice methods, high technology, wonderful personnel and science . . . What in the end created problems was not the professional quality of UNSCOM, but problems on the political side. That is the single, dominant and only reason that it failed.

Ambassador Rolf Ekeus, former UNSCOM chairman, interviewed in Arms Control Today, March 2000

First and foremost it could lead to the tearing up of all treaties and the (Russian) withdrawal from joint inspections of nuclear weapons. Isn't it useful for the Americans to know what's going on here?

Col. Gen. Vladimir Yakovlev, Commander of Russia's strategic missile forces, referring to US National Missile Defense plans, quoted in Michael Steen, 'Russia Nuclear Chief Threatens U.S. Treaty Sanctions', 27 June 2000, dailynews.yahoo.com

. . . to pass muster, a verification system must be able to deter cheating by leaving a potential violator with little confidence that they could escape detection, and it must be able to reassure us . . . and the rest of the world that any militarily significant violations would be caught. By that standard, I believe that the CTBT verification system, together with our own national monitoring capabilities, does indeed pass muster. Nevertheless, I intend to investigate carefully the concerns that have been raised and see how they might be better addressed.

General John Shalikashvili, head of the US Presidential Task Force on the CTBT, speaking at the Carnegie Endowment for International Peace's International Non-Proliferation Conference, Washington, DC, 16 March, 2000

After succeeding in incorporating various obligations into the treaties, including very intrusive verification arrangements, [some countries] now claim that these treaties cannot be truly effective. The logic is beyond our comprehension.

Ambassador Sha Zukang, Director-General, Department of Arms Control and Disarmament, Ministry of Foreign Affairs, People's Republic of China, quoted in Peace, magazine of the Chinese People's Association for Peace and Disarmament, no. 54, March 2000, p. 13

The biological and toxin weapons treaty was useful, but was wilfully flouted by several signatories, most notably the Soviet Union. There was a simple reason for that: no verification was involved. Now, perhaps because of pressure from its biotechnology industries, the United States appears to be reluctant to adopt verification measures. In response to those members of the United States' political right who say that the Soviet duplicity on this issue should show us the danger of trusting treaties, I quote Ronald Reagan, who said that we should, 'Trust, but verify'. Verification will be important in all future treaties.

Mr Malcolm Savidge (Aberdeen, North), MP, debate on weapons of mass destruction, House of Commons, London, 18 Jan. 2000



Satellite house calls

If a satellite develops a fault while orbiting, it is usually impossible to tell what has happened or to fix it. Although satellites do have on-board diagnostic systems they often cannot pinpoint the source of problems, and these systems themselves can, and do, fail. A solution might be a small chaperone craft that could photograph and run diagnostic tests on malfunctioning satellites, and beam the data back to earth.

A team formed by the microsatellite manufacturer, Aero-Astro of Herndon, Virginia, and the space insurance broker, Space Machine Advisors of Greenwich, Connecticut, US, believe that this should be simple. They are currently working on *Escort*, a craft that is about the size of a shoebox and which contains sensors—including infrared mappers—that can detect hot and cold spots, indicating short circuits or thermal leaks. It will also have a broadband radio receiver that listens to sounds emitted by the satellite, helping engineers to identify the malfunctioning device.

It could be launched on special missions, or sent up with new satellites in a dormant state. Once operational it would have a 30-day life span, enabling it to check on several satellites. Each *Escort* microsatellite would cost about \$5m—compared to at least half-a-billion dollars for a communications satellite. While *Escort* is developed, operators could depend on the 'restoration satellite', proposed by AssureSat of California. This will be placed in a geo-stationary position, enabling it take the place of failed communication satellites while they are repaired or replaced.

Source 'Space rescue', *New Scientist*, 16 September 2000, pp. 41–43.

Detecting landmines by smell and resonance

Studies on how dogs smell are being used by researchers to develop an 'artificial nose' to detect landmines. The studies have shown that a dog's aptitude for sniffing out landmines comes partly from its ability to divert exhaled air away from a target scent. This prevents the scent from being confused with exhaled air, and sets up a current that pulls new air across the target, drawing odour molecules towards the dog's nose. The artificial nose removes odour molecules from the air it draws in, allowing it to use the exhaled air as a baseline. The contrast between the baseline and the incoming air enables the system to detect landmines. The machine has been successful in field tests, but, to date, sniffer dogs' noses are 10–50 times more sensitive to smell.

The US has recently tested a prototype mine detector that uses quadrupole resonance technology to find plastic landmines. It is reported that the prototype located all plastic anti-personnel and anti-tank TNT landmines during recent tests, and that the US Army and Marine Corps plan to field the detector.

Source 'Sniffing Danger', *New Scientist*, 26 August 2000, p. 16; 'In brief', *Jane's Defence Weekly*, 8 March 2000, p. 10.

Developing better biosensors

Since early 1997, researchers at four US national laboratories have been collaborating through their 'biological foundations program' to develop more capable sensors for detecting biological warfare agents. The research has reportedly been making good progress. Among the goals of the programme are:

- development of DNA markers to identify harmful pathogens at the genome-level within minutes and at the species-level within 30 minutes;
- identification of the most capable technologies for signature generation;
- development of antibody signatures for plague and other diseases; and
- development of biosensors that sense virulence signatures of genetically engineered pathogens—by detecting an antibiotic resistance gene, for example.

While the programme is aimed primarily at improving domestic responses to bio-terrorist attacks, all of the technologies have great potential in a future verification regime for the Biological Weapons Convention—a protocol for which is currently being negotiated in Geneva.

Meanwhile, portable biodetectors are being improved. The US company, Idaho Technology, is reported to have developed a 40-pound device that can identify a range of biological agents, including plague and anthrax, within 15 minutes. The \$55,000 instrument uses DNA testing and RNA sequencing to identify pathogens. It is already in service in the American military.

Source Arnie Heller, 'Uncovering Bioterrorism: DNA based signatures are needed to quickly and accurately identify biological warfare agents and their makers', *Science & Technology Review*, May 2000, pp. 4–12; Frank Curreri, Military Praises Device That Detects Deadly Viruses, *Salt Lake Tribune*, 24 June 2000, www.sltrib.com.

VIRTUAL VERTIC: copies of *VERTIC Briefing Papers* and executive summaries of *Research Reports* are available on the Centre's website at www.vertic.org

Independent Commission up and running

The Independent Commission on the Verifiability of the Comprehensive Nuclear Test Ban Treaty (CTBT) has begun the 'virtual' phase of its existence. (It was initiated in August by VERTIC to assess the international community's ability to verify compliance with the Treaty.) Fourteen Commissioners—all of whom are eminent scientists with long track records in the CTBT verification debate, and whose combined expertise covers all aspects of CTBT verification—are discussing the current and future capabilities of the agreement's verification system.

They are currently shaping their draft report via e-mail. The Commission will meet once, on 26–27 October 2000 in London, to finalise its report. VERTIC will host a seminar at the British Council in London on Monday 30 October 2000 at 5.30p.m. to present its findings to the public (see the insert in this edition of *Trust & Verify*).

The Commissioners are:

- **Nobuyasu Abe** (Permanent Mission of Japan to the International Organizations in Vienna);
- **Peter Basham** (Provisional Technical Secretariat of the CTBT Organization, Vienna);
- **Elisabeth Blanc** (Commissariat à l'Énergie Atomique, CEA, France);
- **Ola Dahlman** (Advisor to the Ministry of Foreign Affairs, Stockholm, Sweden);
- **Trevor Findlay** (VERTIC)
- **Lindsay H. Hall** (Defence Operational Technology Support Establishment, New Zealand)
- **Herbert E. Huppert** (Cambridge University, Institute of Theoretical Physics and Fellow of the Royal Society, UK);
- **Bhupendra Jasani** (King's College London, UK);
- **Yury Khokhlov** (Research Institute of Pulse Technique, Russia);
- **Peter Marshall** (Atomic Weapons Establishment at Aldermaston, UK);
- **Mordechai Melamud** (Israel Atomic Energy Commission, Israel);
- **Joachim Schulze** (Provisional Technical Secretariat of the CTBT Organization, Vienna);
- **Gregory van der Vink** (Incorporated Research Institutions for Seismology, IRIS, US); and
- **Terry C. Wallace** (University of Arizona, US).

VERTIC is acting as the Commission's Secretariat. Among other activities, this involves organising a range of public and press

events to ensure that the results of the Commission's work are widely disseminated. VERTIC has received funding for the initiative from the John Merck Fund, the Ploughshares Fund, Rockefeller Family Philanthropic Offices, and the governments of Germany and the UK. For more information, see the Commission's website at www.ctbtcommission.org.

VERTIC Kyoto Protocol Workshop

Participants from Europe and the US attended VERTIC's workshop on 'Developing Verification Systems for the Kyoto Protocol', held in London on 28 July. The event was intended to facilitate discussion between experts who are looking at different aspects of verification of the 1997 Protocol. This was timely, given that details of the Protocol are due to be finalised in November at COP6 (see the article on climate change on page 3 of this issue of *Trust & Verify*).

Negotiations on the Protocol have become increasingly complex in recent years, forcing both government delegates and observers to focus on small chunks of the debate in formal negotiating groups. Verification cuts across the mandates of these groups. The workshop examined the connections between ongoing work on the guidelines for monitoring, reporting and review (Articles 5, 7 and 8), the Compliance System, and the Kyoto Mechanisms (Emissions Trading, Joint Implementation, and the Clean Development Mechanism).

A key issue to emerge was the need for parties to discuss reporting and review of 'demonstrable progress' in 2005 (Protocol Article 3.2) and possible links to eligibility to participate in the Kyoto Mechanisms. Participants also noted the verification 'big picture', relating to US ambitions to buy emissions reductions from Russia. They pointed out that heavy investment in Russian monitoring and reporting systems will be required if the country is to be allowed to sell emissions credits. Overall, participants concluded that a priority for COP6 must be to agree on the basic linkages between Articles 5, 7 and 8, the Compliance System and the Mechanisms. VERTIC plans to convene a follow-up meeting in early 2001 to analyse the verification system for the Protocol that emerges from The Hague conference. Papers for the July workshop and a longer report on the meeting are available on the VERTIC website.

OSI project launched

VERTIC's new project on on-site inspections (OSIs) in arms control and disarmament began in August, with the appoint-

ment of researcher John Hart. John was formerly a researcher at the Monterey Center for Nonproliferation Studies in California, US, and a research assistant with the Project on Chemical and Biological Weapons at the Stockholm International Peace Research Institute (SIPRI) in Sweden. The one-year-long study will involve a comparative analysis of OSI regimes in selected arms control agreements. It will cover the OSI protocols, procedures, and technologies involved in the 1972 Biological Weapons Convention (BWC), the 1993 Chemical Weapons Convention (CWC), the 1996 CTBT, and the 1990 Conventional Armed Forces in Europe (CFE) Treaty. A number of treaty-related concepts, such as 'managed access' and 'risk assessments', will also be addressed. A workshop to discuss these issues is scheduled to be convened in early 2001. The results will be published in August 2001.

VERTIC hosts seminar on 'A Systems Audit Approach to Verification'

On 2 August 2000, VERTIC hosted a seminar at the Hatton Conference Centre in London on 'A Systems Audit Approach to Verification: Making Monitoring of Compliance More Efficient?' Stephen Francis, Safeguards Strategy Manager at British Nuclear Fuels Limited, spoke on proposals to use quality assurance and fraud detection techniques to make verification more efficient. Participants from the Department of Trade and Industry, AWE Aldermaston, non-governmental organisations, and academia discussed how systems auditing techniques are applied in other verification contexts, such as environmental agreements, arms control and non-proliferation regimes, as well as in the revenue service.

Verification Handbook

VERTIC has been commissioned by the Geneva-based UN Institute for Disarmament Research (UNIDIR) to produce a *Verification Handbook*, setting out the theory and practice of verification across the range of arms control and disarmament regimes—global and regional. The *Handbook* is intended for use in the context of the Middle East peace process. It is expected to take one year to produce and VERTIC will be appointing a dedicated researcher to undertake the work. It will be published jointly by VERTIC and UNIDIR and will be translated into Arabic.

VERTIC testimony to House of Commons Committee

The House of Commons Foreign Affairs Committee has released its report on Weapons of Mass Destruction (House of Commons, Session 1999–2000, Foreign Affairs Committee Eighth Report, Weapons of Mass Destruction, Her Majesty's Stationery Office, London, 25 July 2000). The report contains VERTIC's written submission (pp. 81–84), oral testimony (pp. 84–92) and a Supplementary Memorandum in response to

Committee members' questions and the testimony of other witnesses (pp. 93–94). Several VERTIC recommendations to the UK government are endorsed in the report, including:

- the need for strong financial support for the work of the Preparatory Commission for the Comprehensive Nuclear Test Ban Treaty Organization; and
- the desirability of the UK impressing on its European partners the need to ratify Additional Protocols to their nuclear safeguards agreements with the International Atomic Energy Agency (IAEA).

VERTIC's original submission is available at its website, with links to the full text of the report at www.parliament.uk.

New Board Member

Joy Hyvarinen of the Institute for European Environmental Policy (IEEP) in London has joined VERTIC's Board. Joy has a Master of Laws from Uppsala University and a Master's degree in public international law from the University of Cambridge. Her recent research has focused on the European Commission's carbon dioxide monitoring mechanism and its policies and measures and the EU negotiating strategy.

VERTIC interns

Sylvia Maurer worked as an intern at VERTIC from August–October. She is a fourth-year student at Freie Universität Berlin, Germany, majoring in political science, with a focus on the European Union. During her internship, she helped to update the *Verification Organisations Directory* and researched the monitoring activities of the Organisation for Security and Co-operation in Europe. VERTIC has recently taken on a new intern until December 2000. Charles Artz, who comes to VERTIC through Educational Programs Abroad (EPA), is a fourth-year student at Albion College, Michigan, US, where he majors in philosophy. Charles will be attending classes at Birkbeck College, University of London, and will be assisting with research on the future verification requirements of a Fissile Material Cut-Off Treaty.

Staff news

TREVOR FINDLAY was invited for lunch at the Indian High Commission on 26 July, in honour of the country's National Security Advisor, Brajesh Mishra. He opened and participated in the VERTIC Kyoto Protocol Workshop on 28 July. From 13–15 September he attended the Second Conference of States Parties to the Landmine Convention in Geneva, and, on 26 September, he took part in a verification workshop at AWE Aldermaston, UK. During the period he worked on several grant applications, edited the *Verification Yearbook 2000* and helped to compile the Independent Commission on the Verifiability of the CTBT's draft report.

OLIVER MEIER visited the Mountbatten Centre for International Security at Southampton University on 13 July to discuss the strengthened nuclear safeguards system with John Simpson and other Centre staff. Oliver attended a 26 July seminar at the International Institute for Strategic Studies (IISS) by Paul Schulte, UK Ministry of Defence, on 'Missile Non-Proliferation: Should We Go Beyond Export Controls?' On 31 July he attended a discussion meeting at IISS led by Dr Michael Guhin, US Negotiator and Representative for Plutonium Disposition. On 14 September Oliver participated in a United Nations Association (UK) meeting on future arms control and disarmament priorities. On 26 September he attended the AWE verification workshop. Oliver has been acting as the Secretary of the Independent Commission on the Verifiability of the CTBT. He finished his chapter on nuclear test ban verification for the *Verification Yearbook 2000*, to be launched in December.

ELLEN PEACOCK continued to be involved in organising the Independent Commission on the Verifiability of the CTBT and established its website. She worked on maintaining the VERTIC website and has been updating and expanding the Centre's annual *Verification Organisations Directory*. Ellen has also begun to reorganise the library, specialising in verification, arms control and disarmament, and environmental material.

CLARE TENNER spent most of July preparing for the VERTIC workshop 'Developing Verification Systems for the Kyoto Protocol' on 28 July. During August, she developed VERTIC's environment programme plan for 2001-02 and produced a funding proposal. She also wrote a VERTIC *Briefing Paper*, summarising some of the discussions at the July workshop. Clare attended the Meetings of the Subsidiary Bodies to the UN Framework Convention on Climate Change from 11-15 September and was present at informal meetings during the preceding week. She contributed to the NGO newsletter, *ECO*, and worked with members of Climate Action Network (CAN) on position papers for COP6. Along with other members of CAN, she met with the EU heads of delegation on three occasions and raised concerns about the Union's negotiating tactics.

ANGELA WOODWARD managed VERTIC's administration, worked on the annual budget for the financial year 2000-01, and completed the Centre's contribution to *Landmine Monitor 2000*. She attended the Second Conference of States Parties to the Landmine Convention in September in Geneva, where the report was launched. She is currently adapting VERTIC's contribution for publication as a *Briefing Paper*. On 19 September Angela, along with Ellen and Clare, took part in a training course, 'Successful communication skills for women'.



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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Verification Yearbook 2000

VERTIC IS RE-LAUNCHING ITS *Verification Yearbook* series in December with a special millennial edition. The 2000 issue will give concise, authoritative and independent analysis of verification developments in the final decades of the twentieth century, and will foreshadow issues and trends that are likely to be of concern to the international community in the future.

The *Verification Yearbook 2000* is divided into four parts, covering arms control and disarmament, the environment and peace agreements, as well as a special section on verification and compliance tools and mechanisms.

The former UN Special Commission (UNSCOM) on Iraq's Executive Chairman, Richard Butler, provides a foreword and the chapters are authored by VERTIC researchers and leading analysts, academics and practitioners.

Some of the highlights are:

- former International Atomic Energy Agency official David Fischer on nuclear safeguards;
- Nicholas Sims of the London School of Economics and Political Science on verifying biological disarmament;
- Annette Schaper on nuclear disarmament verification;
- Jane Boulden of Queen's University, Canada, on verifying and monitoring the military aspects of peace accords;
- Andrew Rathmell of King's College London on the information revolution and verification;
- Tim McCarthy of the Monterey Institute of International Studies, US, on intelligence and verification; and
- Clare Tenner of VERTIC on verifying multilateral environmental agreements.

The *Verification Yearbook 2000* will be available from 7 December 2000 and will cost £30 plus postage.

Advanced orders can now be placed with VERTIC. For an order form and further information, see the Centre's website at www.vertic.org.