Verifiable control of ballistic missile proliferation

A MULTILATERAL INITIATIVE TO CONTROL ballistic missile proliferation has become imperative for arms control, as the global spread of missile capabilities apparently continues, the ineffectiveness of supply-side approaches to control is revealed, and the deployment of US theatre and national missile defence systems looms. Achieving such an initiative, however, would be a formidable task and raises serious verification problems. Nonetheless, it now appears that the foundations for such a regime are being laid.

A key decision is whether to impose limits on research and development (R&D), testing or deployment, or on all three types of activity. Limits on R&D are effective in respect of emergent indigenous systems, but ineffective in controlling the horizontal proliferation of existing systems. Verifying compliance with such agreements would require extensive and intrusive procedures. Test restrictions are effective in preventing new designs and limiting the scope for modifying existing technology, but less effective in preventing the emergence of comparatively unsophisticated indigenous systems. Verification of a ban on testing is relatively simple, since it is not easy to test a missile undetected, and verifying a ban on deployment depends on the way in which missiles are deployed. Open-air deployment or deployment in visible silos is relatively easy to detect, whereas detecting concealed deployments is much harder.

A further issue to be considered is the global distribution of missile technology. Some states will already have missile programmes at the deployment stage, while others will be untested. Some will be willing to accept limits on a deployed weapon, while others merely will agree to halt research. Threat perception rapidly escalates as development advances: a tested missile is considerably more threatening than one at the research stage, while a deployed missile is more threatening still. If the missile has been tested, bans on deployment will only partially address threat perceptions, as rapid 'breakout' from the agreement remains possible.

Also problematic is the dual-use issue. Distinguishing space-launch vehicles (SLVs) from ballistic missile programmes is difficult since much of the required technology is either dual-use or easily convertible. A partial solution is transparency in SLV programmes to reassure outsiders of their peaceful intent. This could be in the form of policy declarations, exchanges of information or on-site inspections. All three would probably be required to obtain sufficient information to ensure that guidance systems, payload, flight trajectory and launch facilities were appropriate for SLVs rather than ballistic missiles. The US, in particular, has expressed concern about the possibility of breakout from such a regime. It is almost impossible to develop an SLV programme that does not have latent convertibility to a ballistic missile programme, so purportedly peaceful SLV programmes can be swiftly weaponised.

The technology for verifying arms control restrictions on missiles has made significant progress in recent years, although it is still a growth area. Some of the technology, such as photo-reconnaissance, radar surveillance and remote sensing satellites, are highly sophisticated,

Inside this issue . . .

Elena Petkova and Kevin Baumert examine the Aarhus Convention and Clare Tenner looks at the collapse of the COP6 climate change negotiations. In addition, all of the usual features: Peace Missions Monitor, Verification Watch, Science and Technology Scan, VERTIC News and Events, and Verification Quotes.

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but expensive. While commercial satellite data is increasingly cheap and accurate, it is not yet sufficiently powerful for some missile verification tasks. The potential for meaningful agreement, therefore, will be to some extent contingent on the verification technology available to the parties involved.

Policy initiatives

While multilateral agreements on missile control are difficult to negotiate and verify, the real problem is a shared one: there are simply no agreed norms regarding the ballistic missile problem. Any regime will have to start from scratch in establishing them. Over the past two years, the idea of a confidence-building approach has been evident in policymaking circles in a number of countries. At their 1999 Noordwijk Plenary in the Netherlands, the members of the Missile Technology Control Regime (MTCR) committed themselves to extending 'responsible missile behaviour' beyond their own supply-side focus. At a meeting in Moscow in March 2000, Russia elaborated this concept when it proposed a Global Control System (GCS) on missile activities. An amalgam of previous MTCR members' proposals rather than a solely Russian initiative, the GCS attempted to define 'responsible' missile behaviour and list possible incentives for states to be responsible. At a minimum, this would involve making missile activities transparent (permitting launch monitoring and providing information about launches); at the maximum, a renunciation of missiles altogether. Incentives would range from international assistance to SLV projects in return for commitments not to convert them to ballistic missile programmes, to security guarantees for states that agreed to give up missiles completely.

The three great virtues of the GCS are its recognition that:

- missile programmes are driven by security concerns and will not be foregone in the absence of security assurances;
- peaceful SLV programmes are legitimate; and
- a culture of openness is necessary for future controls on missile activities.

The US was quick to dismiss the security guarantees idea as unworkable, but was just as quick to agree that transparency was the essential first step.

The most significant development, however, has been in the MTCR itself, which held its 2000 Plenary Meeting in Helsinki, Finland, in October. Having agreed on the need for outreach to non-members, the MTCR drew up a set of principles, commitments, confidence-building measures and incentives, and packaged them into a Code of Conduct Against Missile Proliferation. The Finnish Chair, Ambassador Markku

US and Russia sign accord on missile launches

On 16 December 2000, Russian Foreign Minister Igor Ivanov and US Secretary of State Madeleine Albright signed an agreement on missile launches. The accord will provide pre- and post-launch notification of all ballistic missile tests and space launches. It greatly expands the scope of previous agreements to include shorter-range ballistic missiles and sounding and research rockets, as well as notification of satellites that fail to maintain their orbit. The new system will operate via the Joint Data Exchange Centre in Moscow agreed in June 2000 (see *Trust & Verify*, July 2000). Significantly, the agreement is open to other countries.

Source RANSAC news, 18 December 2000, www.ransac.org; 'Nuclear pact to prevent "accidents"', 16 December 2000, www.cnn.com; *Arms Control Today*, US–Russian Strategic Stability Co-operation Initiative, September 2000, www. armscontrol.org.

The Missile Technology Control Regime

The MTCR, established in 1987, aims to restrict the proliferation of missiles capable of delivering weapons of mass destruction by controlling the transfer of relevant technology. Member states pledge to subject an agreed list of materials and equipment to their national export controls. The MTCR is not a treaty and thus is not binding. Nor is it institutionalised. It has no secretariat, but rather an administrative 'contact point' in Paris. The MTCR currently has 32 members: Argentina, Australia, Austria, Belgium, Brazil, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Poland, Portugal, Russia, South Africa, Spain, Sweden, Switzerland, Turkey, Ukraine, UK, US. In addition, a small number of non-members, including Bulgaria, China, Israel, Kazakhstan, Romania, Slovakia and South Korea, have pledged, with varying degrees of credibility, to abide by its rules, or claim to be 'working towards' adopting them.

Peace Missions Monitor

Russians block return of OSCE mission to Chechnya

The eighth foreign ministers conference of the Organization for Security and Co-operation in Europe (OSCE) in November 2000 ended in acrimony when Russia refused to accept a deadline for the return of the OSCE observer mission to Chechnya. Russia agreed at the OSCE summit in Istanbul in 1999 that the mission could return, but so far it has not been able to reach the war-torn region.
Source *International Herald Tribune*, 29 November 2000, p. 6.

OSCE Police Monitoring Group in Croatia

The OSCE has withdrawn its Police Monitoring Group (PMG) from the Danube region of Croatia after it successfully completed its mission. The Group had taken over responsibility for monitoring, assisting and advising the local multi-ethnic Croatian police from the UN Police Support Group in October 1998. UN Secretary-General Kofi Annan called the exercise a 'model of success for future UN/OSCE co-operation'.
Source *OSCE Newsletter*, vol. 7, no. 11, December 2000, p. 7.

Colombia: FARC rejects inspectors

The Revolutionary Armed Forces of Colombia (FARC) has rejected proposals that local or international inspectors should monitor the demilitarised zone it controls under a peace initiative. A FARC spokesman, Paul Reyes, told *El Tiempo* that 'A verification commission would be extremely important only to verify agreements—and so far there aren't any'. United Nations' special envoy Jan Egelund returned to Colombia in January 2001 to attempt to broker a peace settlement between FARC and the government.
Source Jason Webb, 'UN envoy to visit Colombia as peace talks stuck', *Reuters*, 8 January 2001.

Northern Ireland: verification commission calls for IRA compliance

The head of the Independent International Commission on Decommissioning, Canadian General John de Chastelain, has said that early movement by all paramilitary groups is crucial if decommissioning is to be completed by the target date of the beginning of June 2001. The Irish Republican Army, the most heavily armed of the paramilitaries, has not been in touch with the Commission since June 2000, despite permitting inspections of two of its arms dumps by independent observers outside the Commission's auspices.
Source *Independent*, 23 December 2000, p. 2; *International Herald Tribune*, 3 January 2001, p. 4.

Reimaa, announced the initiative in October at the Conference on Disarmament in Geneva. (During the same session, Iran proposed a UN Study Group to investigate the problem of missile proliferation.)

Details of the Code of Conduct are not yet public, but the above developments are indicative of where consensus might lie. The concept of 'responsible missile behaviour' is being developed to mean increased openness about development and testing, through voluntary declarations or on-site inspections, with limits or cuts in missile forces being deferred to the future. It is, therefore, a flexible concept, and, crucially, is based on voluntary commitments rather than the supply-side cartel model of the MTCR.

As yet, there is little indication of where the Code of Conduct will ultimately lead—to a global missile ban or more limited missile-free zones, for example. Demands for a global missile ban lack credibility in the current climate, while calls for regional bans smack of elitism when the nuclear weapon states, the most capable ballistic missile powers, are unwilling to accept any limitations themselves. Nonetheless, a widely adopted Code of Conduct could avoid the destabilising effects of secret programmes, such as North Korea's *Taepodong*, and may lay the foundations for further efforts. The arrival of President George W. Bush's pro-NMD administration in Washington, DC, means that these developments come none too soon for those interested in alternative ways to tackle missile proliferation.

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Aarhus Convention: using citizens' rights to enhance verification

MOST INTERNATIONAL AGREEMENTS aim to achieve tangible outcomes—such as pollution control, arms reductions or species protection—or the implementation of specific policies, like tariff or quota reductions. The 1998 Aarhus Convention, rather than focussing on outcomes, deals with process. Officially known as the Convention on Access to Information, Public Participation in Decision-Making, and Access to Justice in Environmental Matters, it was signed at the Fourth 'Environment for Europe' Ministerial Conference in Aarhus, Denmark, in June 1998. Forty of the member states of the Economic Commission for Europe (ECE), as well as the European Community (EC) as an organisation, have signed the Convention. The treaty is expected to enter into force in 2001, when 16 states have ratified or otherwise signalled that they are bound by the accord. While the agreement was initiated by the ECE, it is open to any country: hence its global significance.

The agreement grants environmental rights to the citizens of the parties, thereby affecting the way local development decisions are made, as well as seeking to influence national and international policies. The Convention should improve the verifiability of environmental policies by promoting public oversight, engaging the public and non-governmental (NGO) groups in policy-making, and providing avenues for remedying non-compliance.

The pillars of Aarhus

The Convention's three 'pillars' elaborate Principle 10 of the 1992 Rio Declaration, which stresses the need for public participation in environmental decision-making. The first pillar establishes rules and requirements for governments to disclose information about the state of the environment, and the factors, policies and activities that influence it. The second pillar addresses how the public and public interest groups can participate in decision-making on policies and projects with an anticipated environmental impact. The third pillar deals with the right of the public and public interest groups to seek judicial remedy for non-compliance by governments and corporations with the legal obligations established by the first two pillars.

Economic Commission for Europe

The ECE is a regional UN organisation founded in 1947 to promote 'economic dialogue and cooperation' among the countries of Europe. Its membership includes all the states of Europe, plus Canada, the Central Asian Republics, Israel, and the US. For further details see www.unece.org.

National and international implications of the Convention

The Aarhus Convention's provisions are to be implemented by all public authorities, including governments at regional, national and other levels, natural or legal persons performing public administrative functions, and regional economic organisations, such as the EU. The Convention's rules apply to environmental ministries and other government agencies handling environmental and related matters. Public agencies dealing with finance and export credits, for instance, must implement the Convention's provisions insofar as they fund, insure or guarantee projects listed in Annex I of the treaty.

Significantly, once the Convention enters into force, the transactions of multilateral development banks also fall under its rules, requiring public authorities in recipient parties to it to disclose information and to implement public review procedures. This will affect the management of loans by the World Bank, the European Bank for Reconstruction and Development and the European Investment Bank, whose collective loan portfolio to current Aarhus signatories totalled US$24.9 billion in 1996.

The Convention will allow non-governmental organisations and individual citizens to track the performance of economic actors, irrespective of where they operate or their country of incorporation. The Aarhus framework for horizontal accountability of development agents sets common transparency and participation standards 'without discrimination as to citizenship, nationality, or domicile and, in the case of a legal person, without discrimination as to where it has its registered seat or an effective center of its activities'. The Convention thus tries to match access to information, participation and remedy rights to the global nature of capital.

Furthermore, Article 3 requires parties to promote the application of its principles in 'international environmental decision-making processes and within the framework of international organizations in matters relating to the environment'. Signatories are already drafting a disclosure and participation protocol on genetically modified organisms, and in co-operation with the parties to the 1991 Espoo Convention on Environmental Impact Assessment in a Transboundary Context, a protocol on Strategic Environmental Assessment. In addition, Article 3 strengthens the hand of NGOs that are seeking to improve the transparency and verifiability of multilateral environmental agreements, such as the 1997 Kyoto Protocol to the 1992 UN Framework Convention on Climate Change.

Conclusion

The Aarhus Convention provides civil society with a valuable tool for promoting the disclosure of information, public engagement and accountability across governmental (national and international) and corporate spheres. An informed and open public access promises more effective, legitimate and just decisions on projects and policies, greater public trust in existing multilateral environmental agreements, as well as more transparent and verifiable accords in future.

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Verification Quotes

This agreement ends a 13-year regime of 24-hour 'portal monitoring' at the gates of missile assembly plants . . . Every truck, container, vehicle or cargo big enough to carry a missile that came out was inspected.

US Ambassador Steven Steiner on the end of on-site inspections under the 1987 Intermediate-range Nuclear Forces Treaty, quoted in Reuters, 14 December 2000.

Following allegations of the use of Chemical Weapons (CW) in Lainya in southern Sudan in July 1999, 17 environmental samples obtained from the area by Mr Damien Lewis were analysed by DERA [Defence Evaluation and Research Agency], Porton Down for the most likely CW agents and their breakdown products. Although traces of the explosive TNT and its breakdown products were present in eight of the samples, no evidence was found of the CW agents tested for. Low levels of arsenic were measured in 15 of the samples at concentrations well within the expected natural limits for environmental samples. We understand that samples from the same site analysed in both Finland and the United States confirmed the UK analyses. The UK therefore concluded that there was no evidence to substantiate the allegations that chemical weapons were used in Sudan. The UK has informed the OPCW and the Sudanese Government of these findings.

Baroness Scotland of Asthal, Parliamentary Under-Secretary of State, Foreign and Commonwealth Office, UK House of Lords, replying to a written question from Baroness Cox as to whether the UK government would consider requesting a challenge inspection in Sudan by the Organization for the Prohibition of Chemical Weapons, Hansard, 31 October 2000, Column WA81.

'We took the warheads off naval platforms but still require them to be nuclear-ready', he said. 'Our captains are still judged by how well their sailors are trained to handle nuclear weapons, even though nuclear weapons are no longer carried day to day'. I said that the United States had implemented the initiatives differently, in that we no longer have such training requirements. He replied, 'I don't believe you. Why would you make changes absent a formal arms control agreement?'. When I said, 'Budget', he responded, 'I still don't believe you. In our navy, unless there is a legal government-to-government document in the form of a treaty or agreement, the procedures and requirements stay the same'.

Rose Gottemoeller's conversation with a Russian naval captain about Russia's implementation of mutual, but unilateral and unverified US–Russian measures, announced in 1990-91 to remove nuclear weapons from non-strategic naval platforms, reported in 'Lopsided Arms Control', Washington Post, 7 December 2000.

Verification survives COP6 collapse

THE COLLAPSE OF negotiations at the Sixth Conference of the Parties (COP6) to the UN Framework Convention on Climate Change (UNFCCC) bodes ill for the climate regime's future. The meeting—held in The Hague from 20–25 November 2000—was expected to finalise details of the Kyoto Protocol, which was signed in 1997, to allow for its ratification and entry into force. But the parties failed to agree on key issues, both at The Hague and during subsequent diplomatic efforts.

The collapse was not surprising given the political and technical complexity of the negotiators' task. The issue of 'sinks' —widely reported as a major stumbling block—is indicative. The sinks included in the Protocol are land-use change and forestry activities that remove carbon dioxide from the atmosphere. Quite apart from the question of to what extent they can be used to offset states' industrial emissions, the inclusion of sinks raises a host of verification difficulties. These include problems in measuring the size and effectiveness of the sink, the lack of historical comparative data, the possibility that sinks themselves can become sources of greenhouse gases and the impossibility of distinguishing between 'direct human-induced land-use change activities' and indirect and natural changes.

In talks prior to COP6, there were signs of progress on the verification system for the Protocol. For example, the negotiating group covering the Kyoto Mechanisms reached agreement on the basic verification procedures for the Clean Development Mechanism (CDM), which permits Annex I (developed) states to establish projects in developing countries to offset their own emissions. The procedures will be controlled by an Executive Board and will be based on a project cycle consisting of project validation, registration, verification/certification and issuance of credits. Unfortunately, it was not agreed whether projects between developed countries under Joint Implementation (JI) would be subject to such international oversight. For JI and CDM it is still unclear how to set the baseline from which project emissions reductions can be calculated.

Progress was also made on the guidelines for monitoring and reporting on the implementation of the Protocol by state parties, and on the procedure for reviewing these submissions. One positive outcome was agreement to work further on reporting requirements related to 'demonstrable progress' in 2005. Disagreement remains, however, on how to define and deal with inadequate national reporting.

Given the technical and political uncertainty surrounding the Protocol, it would be unwise to forget the verification systems in place under the Climate Convention itself. The COP5 in November 1999 established new guidelines for reporting and review under the UNFCCC, including a Common Reporting Format (CRF) in which parties should submit their annual greenhouse gas inventories. Annex I parties' 1998 inventories in the CRF were due on 15 April 2000. The UNFCCC Secretariat reported to COP6 that 34 of the 41 Annex I parties had reported their 1998 inventories by October 2000 and 23 of these had used the CRF. The Secretariat has developed a database to store, process and retrieve the information submitted electronically in the CRF and to analyse it for the purpose of technical review. The Secretariat has performed initial checks on the CRF submissions and produced a 'status report' for each party, which is published on the UNFCCC website.

Unfortunately the content of the 1998 inventories is not encouraging. Annex I parties' emissions fell six percent between 1990 and 1998, but this was due to emissions reductions in countries with economies in transition, together with reductions by Germany and the UK. All other parties showed increased emissions, many of them very large.

The Secretariat has also completed in-country visits to all Annex I parties—except those that only became parties in 1998—to assess their second national communications. So far 29 reports have been published. Some NGOs have also been assessing these reports —for example, Climate Action Network Central

stop press

Global climate change greater and faster, says IPCC

The third report of the Intergovernmental Panel on Climate Change (IPCC), released on 20 January 2001, puts increasing pressure on states to implement the Convention on Climate Change and its Kyoto Protocol. The scientific report concludes that there is more and stronger evidence of changes to the global climate system attributable to human activities. Future global temperature rises are now predicted at 1.4–5.8 degrees centigrade between 1990 and 2100—almost double previous estimates.

Source www.ipcc.ch

Top 10 greenhouse gas emissions 1990–98

Party	Increase (%), 1990–98	Kyoto target, 2008–12
Monaco	28	-8
Spain	21	+15[1]
Ireland	19	+13[1]
Greece	18	+25[1]
Portugal	17	+27[1]
Australia	15	-8
Canada	13	-6
US	11	-7
Japan	10	-6
Denmark	9	-21[1]

1 Targets under the European Union 'burden-sharing mechanism', which were agreed in June 1998.

and Eastern Europe has published an independent evaluation of the second round of national communications from their region. Developing countries are making progress in producing their first national communications. Ten new initial national communications from non-annex I parties were presented at COP6, bringing the total to 36. But these parties stressed once again that inadequate funding and support from the Global Environment Facility influences both the accuracy of the data and the rate at which national communications are submitted.

While a host of lessons must be learned from COP6, one of the most sobering is that the complexity of implementing a workable Kyoto Protocol should not be underestimated. In the meantime one must not forget (as happened in The Hague) to foster implementation of the Framework Convention itself.

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Verification Watch

Shali's CTBT salvo

After ten months of consultations with Senators, nuclear weapon researchers and arms control experts, General John M. Shalikashvili, Special Advisor on the Comprehensive Nuclear Test Ban Treaty (CTBT), presented his report to US President Bill Clinton on 4 January. It argues in favour of early US ratification of the CTBT, and concludes that the treaty's contribution to US national security would far outweigh any disadvantages. All major arguments against the CTBT are considered in detail and recommendations made on how to address such concerns.

On verifiability, Shalikashvili points out that 'it is important to consider the sum of all sources of information that could be used to determine whether someone has conducted a nuclear explosion'. The report argues that synergies between different verification technologies must be considered and that the agreement's own verification system, national intelligence capabilities and scientific networks are complementary. These conclusions mirror those of the Independent Commission on the Verifiability of the CTBT, initiated by VERTIC, which published its report in October 2000.

To strengthen verifiability further, General Shalikashvili recommends that:

- more funding and intelligence collection capabilities be assigned to monitoring nuclear test activities;
- collaboration between different verification communities be increased;
- new verification technologies be brought quickly into operation;
- the US continue to help prepare for implementation of the treaty's on-site inspection provisions and confidence-building measures; and
- additional steps be taken to increase transparency at known nuclear test sites.

Source General John M. Shalikashvili (ret.), Special Advisor to the President and Secretary of State, Findings and Recommendations Concerning the Comprehensive Nuclear Test Ban Treaty, Washington, DC, 2001, www.state.gov; Independent Commission on the Verifiability of the Comprehensive Nuclear Test Ban Treaty, October 2000, www.ctbtcommission.org; see also Oliver Meier, 'Will Bush budge on the nuclear test ban?', Strategic Pointer, International Institute for Strategic Studies, 15 January 2001, www.iiss.org.

POP goes verification . . .

After four years of negotiations, agreement was reached in December 2000 on an international treaty to regulate the production, shipping, disposal and use of persistent organic pollutants (POPs). The fifth session of the Intergovernmental Negotiating Committee for an International Legally Binding Instrument for Implementing Action on Certain Persistent Organic Pollutants—convened in Johannesburg, South Africa, from 4–9 December—finalised the agreement, covering eight pesticides, two industrial chemicals and two unintended by-products. The treaty makes minimal provision for verification, though. Parties are required to develop national implementation plans to be transmitted to the Conference of Parties (COP) within two years of entry into force and to update them regularly. Parties will also be required to report, at regular intervals in a format to be agreed, on measures taken to implement the treaty and on their effectiveness. The accord provides that the COP develop procedures and mechanisms for determining non-compliance as soon as practicable.

but progress in desertification monitoring

The Fourth Conference of the Parties to the Convention to Combat Desertification, held in Bonn, Germany, from 11–22 December 2000, established an Ad Hoc Working Group to review the 123 national reports submitted since entry into force. While there is no procedure for verifying the information, it was suggested that future discussions cover lessons learned and the next steps required for facilitating the implementation process, including establishing a permanent implementation review committee.

. . . and Montreal Protocol is successful

The Montreal Protocol on Substances that Deplete the Ozone Layer has been successfully implemented, according to analysts working on the World Climate Research Programme's project on stratospheric processes. They claim that stabilisation of ozone depleting substances in the lower atmosphere means that the polar ozone holes should close in about 50 years, although they warn that increased concentrations of greenhouse gases in the atmosphere could jeopardise this. One reason for the Protocol's success is its strong verification system, which continues to ensure compliance. At the Twelfth Meeting of the Parties, held in Ouagadougou, Burkina Faso, in December 2000, the Implementation Committee reported that important milestones had been reached with respect to reporting and phase-out. The Committee pointed out that it had successfully dealt with deviations by Israel from its commitment to phase out methyl bromide, but it expressed concern over Russian non-compliance with the Protocol.

Source 'Summary of the Fifth Session of the Intergovernmental Negotiating Committee for an International Legally Binding Instrument for Implementing International Action on Certain Persistent Organic Pollutants: 4–9 December 2000', *Earth Negotiations Bulletin*, vol. 15, no. 54, 12 December 2000; 'Summary of the Fourth Conference of the Parties to the Convention to Combat Desertification: 11–22 December 2000', *Earth Negotiations Bulletin*, vol. 4, no. 149, 26 December 2000; Mark Schrope, 'Successes in Fight to Save Ozone Layer Could Close Hole by 2050', *Nature*, vol. 408, 7 December 2000, p. 627; 'Summary of the Twelfth Meetings of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer: 11–14 December 2000,' *Earth Negotiations Bulletin*, vol. 19, no. 12, 15 December 2000.

Russia: fissile material (and other) accounting and monitoring

- Russia will allow Norway to inspect a Russian storage site for spent nuclear fuel and radioactive waste from nuclear submarines at Andreeva Bay on the Kola Peninsula, 28 miles from the Norwegian border.
- The US has announced that 10 metric tons of fissile material has been secured at the Novosibirsk Chemical Concentrates Plant in Siberia. The material was moved under the Russia–US Material Protection, Control and Accounting (MPC&A) programme to protect it from theft. The US Department of Energy says security upgrades are underway for 750 of the estimated 960 metric tons of Russian nuclear materials requiring security.
- US Senator Pete Domenici has introduced a bill to provide additional incentives for Russia to place fissile materials under international safeguards. The Fissile Material Loan Guarantee Act would authorise federal guarantees of loans of up to US$1 billion, but Russia would have to place two metric tons of weapons-grade material (one ton of highly enriched uranium and one ton of plutonium) under international safeguards for each US$20 million received. The loans would be for nonproliferation or energy programmes. The International Atomic Energy Agency, which is reportedly aware of the proposal, would administer safeguards. US President-elect George W. Bush accused the administration of US President Bill Clinton of unwarranted largesse to Russia, but he has exempted nonproliferation aid from future restrictions by his administration.
- The Russian Audit Chamber and the US General Accounting Office have agreed to conduct joint inspections covering bilateral areas as diverse as US humanitarian aid, environmental protection, uranium imports and chemical and nuclear weapons. The results will be reported to their legislatures.

Source Doug Mellgren, 'Russia Will Allow Norway Inspection', *Associated Press*, Oslo, 15 December 2000; 'U.S. Says Nuclear Materials Secured In Russia', *Reuters*, 17 November 2000; Press Release, Office of Senator Pete

V. Domenici, Domenici Introduces Fissile Material Loan Guarantee Act, Washington, DC, 7 December 2000; 'Russia, US to make joint audit inspections', *Itar–Tass*, 30 November 2000.

CWC: Iran's compliance questioned; Johnston Atoll delivers

The Director-General of the Organization for the Prohibition of Chemical Weapons (OPCW)), José M. Bustani, has apologised to Iran over an article in the November 2000 issue of *OPCW Synthesis*. The article by Professor Gerald M. Steinberg, Director of the Program on Conflict Management and Negotiation at Bar Ilan University, Israel, questioned the effectiveness of the Chemical Weapons Convention (CWC) and Iran's compliance with the treaty. Bustani stressed the Secretariat had no reason to question Iran's full compliance. Later, in an open letter to Bustani, Steinberg said that it would be a 'positive development' if the OPCW and Iran were able to 'demonstrate that these [compliance] concerns are invalid'. Bustani also rejected the claim in another article in the same edition of *OPCW Synthesis*, by retired Egyptian General Moukhtar El Fayoumi, that the CWC verification regime was ineffective against the use of chemical weapons by non-state actors.

Meanwhile, in December, the Johnston Atoll Chemical Agent Disposal System destroyed the last US chemical weapons located at the Pacific atoll. The facility will be dismantled. The US has eight other sites where chemical weapons are stockpiled and one operational destruction plant at Tooele, Utah.

Source Organization for the Prohibition of Chemical Weapons, Office of the Director-General, 'Statement by the Director-General of the OPCW', Vienna, 8 December 2000; Gerald M. Steinberg, 'Israeli policy on the CWC', *OPCW Synthesis*, Autumn–November 2000, pp. 29–31; Moukhtar El Fayoumi, 'The CWC in the present Middle East environment: an Egyptian view', *OPCW Synthesis*, Autumn–November 2000, pp. 26–26; and Gerald M. Steinberg, 'Clarification in response to the statement of the Director-General of the OPCW—8 December 2000', open letter to OPCW Director-General José M. Bustani, 27 December 2000; Pamela Mills, 'Progress in The Hague, Developments in the Organization for the Prohibition of Chemical Weapons', *CBW Conventions Bulletin*, December 2000, no. 50, p. 13.

Conventional arms control monitoring

- The Organisation for Security and Co-operation in Europe (OSCE) has adopted a far-reaching agreement to combat the spread of small arms. The result of 11 months of negotiations, the agreement, for the first time seeks to establish norms and measures for monitoring the proliferation of military-type weapons in the OSCE region. Under the agreement, states will exchange information on exports and imports of small arms within the region. They will aim to combat illegal trafficking and the sale of small arms by prosecuting illegal manufacture, marking weapons and destroying illegal weapons. New licensing standards have also been produced.
- The Programme for Co-ordination and Assistance for Security and Development (PCASED), an initiative by the UN Development Programme (UNDP) to support the light weapons moratorium in West Africa, has revised its March 1999 Plan of Action due to insufficient funding and lack of political will. The new five-point plan retains the much-needed register of small arms, while the goal of harmonising national law and administrative procedures in the region has been dropped. Despite the setbacks, the programme has achieved some notable successes, such as the decommissioning of hundreds of weapons in Niger and the destruction of 19,000 in Liberia.
- Burkina Faso is to establish a body to monitor arms imports to counter allegations that it is supplying weapons to the Revolutionary United Front in Sierra Leone and the National Union for the Total Independence of Angola.
- A Regional Arms Control Verification and Implementation Assistance Centre (RACVIAC) was established in Zagreb, Croatia, on 20 October 2000, as part of the Stability Pact for Southeast Europe. The Centre aims to: contribute to a common understanding of current agreements between state parties; provide information on obligations under international arms control agreements and their implementation by regional governments; provide an international forum for training verification personnel; and promote confidence- and security-building measures in southeast Europe.

Source *OSCE Newsletter*, vol. 7, no. 12, December 2000; *Jane's Defence Weekly*, 13 December, 2000, p.17; *The Conflict, Security & Development Group Bulletin*, Centre for Defence Studies, London, October–November 2000, pp. 9–10; *Jane's Defence Weekly*, 25 October 2000, p. 12; www.stabilitypact.org.

Japan and Norway self-monitor their illegal whale catches

Japan and Norway have announced plans to archive the DNA of whales. The plan comes after a group of marine biologists using DNA sampling verified that some whale meat on sale in Japan came from unreported catches of the endangered 'J' stock of North Pacific minke whales (see *Trust & Verify*, July 2000), putting Japan in violation of its obligations under the 1946 International Convention for the Regulation of Whaling. Japan and Norway both undoubtedly see the establishment of a DNA monitoring system as a key step in overcoming international resistance to the resumption of commercial whaling.

Source *Nature*, vol. 408, 30 November 2000, p. 508; *International Herald Tribune*, 17 January 2001, p. 8

Science & Technology Scan

New biological agent detectors . . .

Tetracore LLC of Gathersburg, Maryland, US, has developed two new types of biological agent detection devices. The Bio-Threat Alert (BTA) consists of a white paper strip placed in a small plastic device. The strip contains antibodies that bind with botulinum and ricin toxins, as well as anthrax and plague bacteria. A second device recognises selected gene sequences specific to particular biological agents. This provides a much higher level of sensitivity and can still be successful after the target bacterium has died. The Chicago Fire Department's Hazardous Materials Division used BTA strips in December 2000 to determine in 15 minutes that a substance found in a letter labelled as containing anthrax was harmless. The strips are expected to be available by February 2001 for detecting botulinum toxin and staphylococcal enterotoxin B (SEB), the latter being an incapacitant that has been weaponised in the past.

US-based Barringer Technologies Inc. and London-based Lipoxen Technologies Ltd are to develop a new method to rapidly detect food pathogens, including *Escherichia coli* and *Serratia marcescens*. The liposome-based technology called IONSCAN has potential applications for detection of biological warfare agents.

. . . but Australians invent new agent

Ron Jackson, a researcher at Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO), and Ian Ramshaw of the Australian National University (ANU) have created a strain of mousepox virus that completely suppresses the cell-mediated immune system of mice. It was the unintended consequence of inserting a gene in the mousepox virus to stimulate production of large amounts of interleukin 4 (IL-4). Since the work has dual-use applications, the researchers sought permission from the Australian Defence Department to publish the results. A report on the research will appear in the February 2001 issue of the *Journal of Virology*. The use of such modified viruses for military purposes is prohibited under the 1972 Biological and Toxin Weapons Convention.

Source Terence Chea, 'Countering germ warfare', *Washington Post*, 17 November 2000, p. E05, www.washingtonpost.com; 'Chicago uses new on-site testing of equipment during recent anthrax scare', press release, 7 December 2000, www.alexeter.com; Fred Woodhams, 'Wheeling product used to determine biological terrorism', *Daily Herald*, 14 December 2000, www.dailyherald.com; 'Barringer Technologies Inc. signs development for rapid pathogen detection', *Business Wire* (press release), 8 November 2000, biz.yahoo.com.html; Rachel Nowak, 'Disaster in the making', *New Scientist*, 13 January 2001, pp. 4–5; genetech.csiro.au.

Satellites abounding

- A US congressional commission has called for an immediate review of a presidential directive that set the protection of American military forces abroad as the top priority for the country's spy satellites. There are increasing pressures from other US government departments to be granted access to satellite information, presumably including for verifying compliance with international agreements, such as those in the arms control and disarmament field.
- The US government, meanwhile, has granted a Colorado company a licence to sell high-resolution satellite photographs (down to 0.5 metres) to its customers around the world. Although the move took place without public announcement, it effectively relinquishes the monopoly of US intelligence agencies on precision imagery from space.
- In early December Israel launched the Eros A-1 reconnaissance satellite using a Russian booster. The satellite, with a resolution of 1.8 metres, is the first of a possible eight new satellites that the country plans to launch.
- Canada's military science and technology organisation plans to triple, to 35 million Canadian dollars, the annual amount it spends on space research. The emphasis will be on intelligence gathering and surveillance, presumably including monitoring the implementation of arms control and disarmament agreements.
- The US air force is developing a new infrared sensor that will reduce the weight and cost of satellites and extend their life by obviating the need for additional cooling systems.
- A US congressional panel has proposed the creation of an Office of Space Reconnaissance, based in the US National Reconnaissance Office, which would develop new US satellite capabilities, such as 24-hour, all-weather radar.

Source *International Herald Tribune*, 21 November, 2000, p.3; *International Herald Tribune*, 18 December 2000, p.3; *Jane's Defence Weekly*, 13 December 2000, p. 17; *Defense News*, 6 November 2000, p. 12; *Defense News*, 6 November 2000, p. 10; *Defense News*, 11 November, 2000, p. 17.

Verification Yearbook 2000 launched

VERTIC held a successful launch of its *Verification Yearbook 2000* on 8 December at the Hatton Conference Centre in London. Copies are now available from VERTIC and individual chapters can be downloaded from the VERTIC website. Work has already begun on *Verification Yearbook 2001*, which will be edited by Oliver Meier.

VERTIC | *News & Events*

Landmine Handbook

VERTIC has been commissioned by the states parties to the 1997 Landmine Convention to draft a handbook to assist them in meeting their reporting obligations under Article 7 of the treaty. The draft will be presented to states parties at the meeting of their intersessional working groups in May in Geneva. The government of Belgium is funding the exercise. For the third year running, VERTIC has received a commission from Landmine Monitor to produce a thematic report for the annual assessment of implementation of the Landmine Convention. This year VERTIC will update its 1999 report on national implementation legislation. Angela Woodward will do the work.

Verification Handbook

VERTIC has contracted Canadian researcher Jane Boulden, currently a visiting scholar at Oxford University, to draft the *Verification Handbook* that it is producing for the UN Institute for Disarmament Research (UNIDIR). The *Handbook* is intended for use in the context of the Middle East peace process. It is expected to take at least a year to complete.

New intern

Kelly Groll, a politics student at the University of Vermont, US, commenced her internship at VERTIC on 22 January for three months. She will assist the Executive Director with his research on peace operations, as well as undertaking general office duties. Charles Artz, VERTIC's previous US intern, has returned to resume his studies at Albion College, Michigan.

Staff news

TREVOR FINDLAY attended the intersessional meetings of the states parties to the Landmine Convention in Geneva on 7 December, where he presented an outline of VERTIC's work on an Article 7 Handbook and held discussions with various delegations and the International Campaign to Ban Landmines. On 8 December he presided over the launch of the *Verification Yearbook 2000* in London. He had other meetings during the period with: Susan Woodward of King's College London on 28 November on the verification of peace agreements; Jeremy Leggett of Solar Century on 6 December on climate change issues; Sue Downie of Monash University, Australia, on peace building; and Sarah Meek of International Alert on 12 December on verification of small arms limitations. On 6 December he attended a workshop at the Royal Institute of International Affairs (RIIA) on the failure of the climate change conference in The Hague. On 15 January he attended a presentation by Michael Krepon of the Henry L. Stimson Center, Washington, DC, on national missile defence issues at the International Institute for Strategic Studies (IISS). His written work during the period included an article on 'The role of monitoring and verification' for a forthcoming special edition of *Contemporary Security Policy* on the military dimensions of intervention. And, with Oliver Meier, he wrote 'In verification we trust' for *The Bulletin of the Atomic Scientists*, January–February 2001.

JOHN HART has been preparing for the VERTIC workshop on on-site inspections in March and on completing his manuscript on industry inspections under the Chemical Weapons Convention. He published 'The CWC: compliance concerns and challenge inspections', *ASA Newsletter*, no. 81, 14 December 2000.

OLIVER MEIER wrote an article for the forthcoming second issue of the *Nuclear Weapons Convention Monitor* on nuclear transparency and confidence-building and a *Strategic Pointer* for the IISS website on the options facing President George W. Bush on CTBT ratification. On 15 December he met with Sue Mayer of GeneWatch UK to discuss the BWC verification protocol. On 15 January he attended a presentation at the RIIA by the IAEA Director General, Mohamed ElBaradei. On 18 January he attended a seminar at IISS by Robert Einhorn, Assistant Secretary of the Bureau of Nonproliferation, US State Department, on 'Nonproliferation Challenges Facing the new US Administration'.

ELLEN PEACOCK has been organising the distribution and promotion of VERTIC's *Verification Yearbook 2000*. Additionally, she attended a briefing on COP6 on 19 December with Clare Tenner and a training course on 'Organising successful events, conferences and seminars' at the Centre for Strategy and Communication on 11 January. She has been compiling VERTIC programme and project descriptions for VERTIC's website and is planning for the redesign of the site.

JOHN RUSSELL helped out with administrative tasks and researched ideas for a VERTIC *Research Report* on nuclear disarmament verification. He began a project on the verification of the INF treaty in December. In addition, he researched sources of funding for VERTIC's environment programme.

CLARE TENNER attended the Climate Change Convention conference in The Hague, Netherlands, from 13–24 November 2000. She followed all verification-related aspects of the negotiations, particularly those pertaining to guidelines for national reporting on implementation of the Kyoto Protocol. Clare advised delegates and observers on developments in this area and wrote articles for the *Eco* newsletter. On 4–5 December 2000, Clare participated in a workshop in Washington, DC, arranged by the Center for International Earth Science Information Network (CIESIN) of Columbia University, New York, on 'Remote Sensing and Environmental Treaties: Building More Effective'. She took part in a sub-group's discussions on the use of remote sensing for treaties dealing with the atmosphere and climate. On 7 December she met with other core members of Climate Action Network UK to talk about follow-up action in light of the collapse of the conference in The Hague. Clare and Trevor Findlay met with Rosalind Reeve, a member of VERTIC's International Verification Consultants Network, on 15 December to discuss VERTIC's work on the environment, and on 19 December she and Ellen Peacock attended a COP6 debriefing by the Foundation for International Environmental Law and Development (FIELD).

ANGELA WOODWARD managed the organisation's administration, helped to prepare VERTIC's accounts for the annual audit, and produced end of financial year reports for key funders. As part of her work on the Landmine Convention she represented VERTIC at the Standing Committee meetings of the Landmine Convention in Geneva from 4–8 December. Angela also attended the Mohamed Elbaradei seminar at the RIIA on 15 January.

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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