# Mind the (verification) gap!

It is surprising that there is no regular and systematic effort to gather data on global patterns of expenditure on scientific and technical work in support of arms control, non-proliferation and disarmament—in the same way, for instance, that a number of bodies compile frequent and detailed records of such activity in support of weapons development worldwide. In the nuclear field in particular, the emphasis that many governments place on the 'verifiability' of arms control makes the role of technology in this sphere a subject of obvious importance—indeed it is much discussed in the literature. Improved understanding of the scale, organisation and objectives of existing scientific and technical research work in the arms control field would highlight opportunities for reform or for the expansion of global initiatives.

Even allowing for a broad definition of relevant work, say 'verification and other aspects of nuclear arms control, nonproliferation and disarmament', ambiguity exists over whether certain areas of research, or particular government or institutional programmes, should be categorised as verification and arms control expenditure or be considered part of more general 'national security' spending. Indeed, even when expenditure on monitoring technologies can be tied directly to a requirement to assess compliance with an arms control agreement (the nuclear test ban, for example), it may be the case that some countries would want to obtain the same kind of information for national security purposes regardless of whether a treaty existed or not. Clearly, there is no simple means of classifying such research and development (R&D), since it has applicability both to arms control and to broader national security.

A cursory look at the field reveals that perhaps more than 90 percent of global verification-related scientific and technical work occurs in the US. China, France, Russia and the UK, the other established nuclear weapon states, fund at least some relevant research, as do a number of other countries, either in connection with civil nuclear power programmes or as part of their multilateral arms control endeavours.

In the US, nuclear verification and arms control work is a major programme item at the newly constituted National Nuclear Security Administration, part of the US Department of Energy (DOE). The largest block of funding specifically directed to arms control, nonproliferation and disarmament (US$874 million in Fiscal Year 2001) was awarded to the Office of the Deputy Administrator for Defense Nuclear Nonproliferation. Among other things, these resources constitute the principal means of support for substantial (more than US$100m) programmes at each of the national nuclear weapon laboratories. This is where much of the research, development and technical analysis most directly, although not exclusively, concerned with progress in nuclear arms control and disarmament, is conducted.

## Inside this issue . . .

Tom Milne examines global spending on nuclear disarmament verification work, while Mirak Raheem assesses the challenges facing the Temporary International Presence in Hebron. In addition, all of the usual features: Peace Missions Monitor, Verification Watch, Science and Technology Scan, Verification Quotes and VERTIC News and Events.

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The US Department of Defense (DOD) also funds broadly relevant work, much of which is carried out by the Defense Threat Reduction Agency, which sponsors, for example, the Co-operative Threat Reduction Program. In addition, the DOD makes substantial funds available in other pertinent areas, notably for space-based monitoring systems. The scale is not easily determined, though, as verification-related work is buried in huge procurement and research, development, testing and evaluation (RDT&E) budgets. In other areas, research may have some applicability to arms control, but this is incidental in relation to the primary purpose of the project. At a rough guess, DOD funding for verification-related work might be comparable to total DOE funding. As a rule of thumb, the DOE tends to fund R&D through the prototype stage, while the DOD funds the development of equipment for operational use.

## Global verification patterns

Worldwide work on nuclear verification and arms control falls into three main areas:

- verification of nuclear arms reductions;
- global nuclear materials management; and
- nuclear explosion monitoring.

The US and Russia have run bilateral programmes in regard to the transparency of warhead dismantlement since it was signalled in 1997 that this would form a part of a prospective Strategic Arms Reduction Treaty (START) III. The UK has also started to prepare for future multilateral nuclear reductions: a small group began work in April 2000 at the Atomic Weapons Establishment, supported by an annual budget of £1m.

In the area of global nuclear materials management, the physical security and safeguarding of weapon-usable fissile material in the former Soviet Union has been the primary issue of concern for the past decade or so. The US has spent hundreds of millions of dollars on material protection, control and accounting activities over the past several years, and anticipates spending at least a further US$1–2 billion over the next decade, dwarfing contributions from European and other countries.

A limited amount of scientific and technical work continues in support of International Atomic Energy Agency (IAEA) safeguards, through national technical programmes known as IAEA Member State Support Programmes. Most of the individual programmes have annual budgets of some US$1m. While small in absolute terms, in many cases, these programmes constitute a substantial part of total arms control and nonproliferation-related work in the country concerned. Work on disposition options for weapon-usable fissile material declared surplus to defence needs is a significant part of DOE arms control activity.

Finally, in the case of nuclear test monitoring, the US programme is (again) by far the world's largest in all aspects. The Soviet Union is known to have had a significant test monitoring operation. Today, Russia continues to invest some money in monitoring programmes, although its capabilities are severely degraded and little information is made public. China is similarly unforthcoming with details about its test monitoring activities. Among the other countries known to carry out some test monitoring, the focus is usually on seismic detection, given limited resources (again, these programmes are mostly funded at a level of one or a few million dollars a year).

## Conclusion

US bodies, principally the DOE and the DOD, provide approximately US$2bn of funding for scientific and technical work relevant to verification and other aspects of nuclear arms control, nonproliferation and disarmament. Much of this work is driven by more general national security initiatives, however, and would continue in the absence of arms control regimes and accords.

Precise international comparisons of support for verification are difficult. China and Russia, in particular, are far less open about defence-related expenditure than the US. Yet it must be assumed that China and Russia, as well as a few other countries, fund space activities, materials work and other national security programmes that have some applicability to verification and arms control. Funding outside the US of technical work directly in support of arms control and disarmament is probably in the region of US$50–100m, a relatively small fraction of the US figure.

Given the range and complexity of the technical problems involved in the verification of nuclear disarmament, and the need for national technical expertise to ensure that the national interest is safeguarded in any disarmament process, more resources could productively be invested in the field, particularly outside the US. If such funding becomes available it will be important to look for practical ways to maximise the benefit of such investments—for example, by establishing or expanding verification and arms control programmes at national nuclear facilities.

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# The Temporary International Presence in Hebron: monitoring violence or peace?

As the second Intifada between Israelis and Palestinians drags into its seventeenth month and casualties continue to mount, there have been increasing calls for some form of international presence to help stem the cycle of violence. As the only such mission currently on the ground, the Temporary International Presence in Hebron (TIPH) is a test case for assessing the benefits and limitations of observation and monitoring the Israeli–Palestinian conflict. The dangers facing this little-known mission were starkly illustrated in March 2002, when two TIPH observers (one from Switzerland and one from Turkey) were killed.

The TIPH set a crucial precedent: it was the first time that Israel had agreed to an international presence in the West Bank or Gaza. Traditionally, Israel has viewed any international mission as likely to be biased, and an obstacle to implementing security measures and projecting national power. In general, the Palestinians have favoured an international presence, which they see as a safeguard against Israeli aggression. While the two sides agreed in principle to such a mission in their joint 1993 Declaration of Principles (DOP), the TIPH was the first concrete manifestation.

An agreement setting up the TIPH was signed by Israel and the Palestinians on 31 March 1994. The force was dispatched in response to the 25 February 1994 massacre of 29 worshippers at the al-Ibrahimi Mosque in Hebron by a lone Jewish extremist. It was hoped that the deployment would shore up the confidence of the Palestinians, who had withdrawn from peace talks in protest. The mandate of TIPH 1 was to 'assist in promoting stability and in monitoring and reporting the efforts to restore normal life in the city of Hebron, thus creating a feeling of security among Palestinians'. Reports would be forwarded to TIPH participating states and to liaison committees comprising representatives of the mission and the two warring parties, but they would not be made public. In addition, the TIPH was to engage in local mediation efforts.

Norway, which had played a crucial role in brokering the 1993 Oslo Accords that started the peace process, agreed to lead the mission. By 8 May 1994, 160 observers and support staff from Denmark, Italy and Norway were on the ground. Approximately half of the observers had military backgrounds, while the rest were former police officers. Despite having the right to carry arms, the participating countries decided that the observers would not do so. Restricted to wielding cameras and notebooks, the observers patrolled Hebron on foot or by car. The mission ended in August 1994 when its monthly mandate was not renewed by the Israeli government and the Palestinian Liberation Organisation (PLO). This was due more to the fact that the attentions of the warring parties was focused on an 'OSLO II' agreement than to any major dissatisfaction with the performance of the mission.

TIPH was revived following the signing of the January 1997 Protocol Concerning the Redeployment in Hebron, which saw complete Israeli withdrawal from the 80 percent of the city that was completely Arab (H1) and partial withdrawal from the Old City, which was home to 15,000 Arabs and 450 Jews (H2). The new 142-strong multilateral mission included observers from three additional countries: Sweden, Switzerland and Turkey. The mandate and capabilities of TIPH 2 largely replicated those of the original mission. The major difference was the strengthening of its mediation role by incorporating it into the security co-ordination mechanisms between the Israeli and Palestinian security agencies. These mechanisms were to function at the local, district and national levels, and involve the Palestinian police, Israeli army and the relevant ministries of both sides.

## Unique role, limited impact

Unfortunately, the effect of the TIPH on the security of Hebron's Palestinian residents has been limited. While it may have curbed or prevented some Israeli army responses to provocations by Palestinian civilians, more often than not it could only play the role of the helpless onlooker. A Human Rights Watch Report of April 2001 found human rights violations by both Israelis and Palestinians to be 'widespread', with the Israeli army responsible for the 'most extensive abuses'. The fact that the report completely overlooked the presence of the TIPH and recommended that an independent monitoring body be established illustrates how little impact the mission had had.

There are a number of reasons why the mission experienced difficulties. First the limitations of its mandate meant that it could not meet the expectations of the local population. The TIPH was not given the power to monitor, verify or enforce the

## Verification Quotes

Prudence alone recommends not relying solely on the IAEA to determine whether the Korean Peninsula is free of nuclear weapons. A complementary approach, based on a step-by-step process of creating North–South nuclear projects and mutual nuclear inspections, could provide valuable insurance.

David Albright and Holly Higgins, 'North Korea: it's taking too long', *The Bulletin of Atomic Scientists,* vol. 58, no. 2, January/February 2002, pp. 56–61.

It's the best environmental monitoring system ever conceived and devised. (It is) seeing all kinds of things around the world and I bet people will take advantage of it.

Peter Basham, IMS Coordinator at the Provisional Technical Secretariat of the CTBT Organisation on the capabilities of the International Monitoring System, quoted in David Ruppe, 'CTBT: Progress Mixed on Organization's Five-Year Anniversary' *Global Security Newswire,* 19 March 2002, www.nti.org.

Agreement has been reached that it will be based on the verification mechanisms of the existing START-I Treaty and supplemented with new transparency and confidence measures with respect to nuclear warheads, the post reduction levels of which must be 1,700–2,200 units.

Alexander Yakovenko, The official spokesman of Russia's Ministry of Foreign Affairs answers questions regarding a Russian–American Treaty on the Reduction of Strategic Offensive Arms, Russian Ministry of Foreign Affairs, 27 February 2002, www.ransac.org.

If this satellite tracking technique is used to help whalers, what hope have the whales got?

Richard Page of Greenpeace on plans to launch in October a Japanese satellite dedicated to monitoring the migration of minke whales, quoted in Emma Young, 'Japan to launch whale-tracking satellite', *NewScientist.com,* 8 January 2002, www.newscientist.com.

Cosmetic inspections are worse than none because they may lull states into a false confidence and they may wake up in a horrible situation. Therefore all inspections have to be credible.

Hans Blix, head of the UN Monitoring, Verification and Inspection Commission (UNMOVIC), quoted in 'UN arms expert no "cosmetic" inspections in Iraq', *New York Times,* 3 March 2002, www.nyt.com.

implementation of the Hebron agreements themselves or even to act as a buffer between the Jewish and Palestinian populations—as the United Nations Force in Cyprus (UNFICYP) has done with regard to the Greek and Turkish Cypriot communities. As the TIPH 2 agreement puts it, the mission was not to 'interfere in disputes, incidents or activities'. Its mandate was simply to be present and observe, in the hope that this might deter, forestall or mitigate violence.

Second, Hebron is a particularly hard case. The city of 200,000 people is rife with extremism, Jewish and Muslim, and is thus more prone to violence and hostile to external intervention. The violence, as in the rest of the Occupied Territories, has multiple sources, related to armed settlers, the Israeli military, Palestinian militia and demonstrators.

Third, the mission has been unable to perform its most basic task of monitoring in times of crisis due to harassment and obstruction, principally by the Israelis. In August 2000 the TIPH came under attack from Jewish settlers and was forced to halt its patrols in the H2 area temporarily. In May 1994 Israel imposed a curfew not just on Hebron Arabs but also on the TIPH, a precedent that would hamper TIPH 2. Since September 2001 the Israeli army has denied the TIPH access to the H2 area, which was placed under a virtual 24-hour curfew.

Fourth, the mission failed to gain the confidence of the Israeli and Palestinian security agencies. Instead of acting as a meeting point to increase bilateral contact and co-ordination, the consultation mechanism became a forum for the presentation of complaints. The Israeli army, in particular, was suspicious of the TIPH, which it viewed as partial.

Finally, the TIPH was undermined by its lack of permanence. TIPH 1 relied on monthly renewals of its mandate, while TIPH 2 was extended every three months.

### The future of the observation missions

The Mitchell Report of May 2001 lauded international forces in the region provided that they had the support of both parties and suggested that the TIPH might be used to help manage 'friction points' outside Hebron. US Secretary of State Colin Powell has since apparently warmed to the idea of an international force to help defuse the Israeli–Palestinian conflict. The ideal scenario would comprise an armed international peacekeeping force, with the ability to defend itself and to keep the peace. Such a deployment is unlikely, however, because of continuing Israeli opposition. The alternative would consist of an unarmed observer mission, along the lines of the TIPH, but deployed along the entire Israeli/Palestinian interface. Such a mission would need to be larger, better equipped, have the confidence of the two sides (particularly their respective security agencies), and the political leverage to ensure that it could not be marginalised, especially by Israel. Participation by US personnel would thus be essential, as would a longer-term mandate and security guarantees from the Israelis and the Palestinians. Whether such an international presence is possible will depend on the larger dynamics of the conflict and the resuscitation of the ailing peace process.

**Mirak Raheem,** VERTIC intern.

# Verification Watch

## Child soldiers outlawed

A United Nations (UN) treaty banning the use of child soldiers entered into force on 12 February 2002, three months after New Zealand deposited the required tenth instrument of ratification. The Optional Protocol on the Involvement of Children in Armed Conflict to the United Nations Convention on the Rights of the Child prohibits the use by states and armed groups of combatants under the age of 18 in direct hostilities or their compulsory recruitment. The protocol currently has 100 signatories and 17 states parties. Nations may now join the protocol by accession.

The protocol's monitoring provisions mirror those in the umbrella convention. States parties are required to submit an initial report to the Committee on the Rights of the Child—established under the convention—within two years of the protocol's entry into force for them, on what measures they have taken to implement the protocol. States are obliged to submit further reports every five years providing updated information on their implementation measures. The 10-member committee reviews the reports and may request additional information or complementary reports. However, as the committee is currently behind its intended schedule of reviewing reports submitted under the convention within one year of receipt, the additional burden of reviewing reports under the protocol will necessitate further consideration of proposals to increase this committee to 18 members.

**Source** 'Status of ratification', Coalition to Stop the Use of Child Soldiers, 13 March 2002, www.child-soldiers.org; 'Enforcing child soldier ban', BBC News Online, 12 February 2002; 'Who monitors implementation of the convention', UNICEF, www.unicef.org.

## IAEA visits North Korea, inspects Iraq and reviews terrorism

- A team of International Atomic Energy Agency (IAEA) inspectors visited the Isotope Production Laboratory in North Korea from 15–19 January 2002. The facility is located at the Nyongbyon site, where the IAEA continues to monitor the freeze of the North Korean nuclear programme. Oli Heinonen, director of the Agency's safeguards department, led the team. An IAEA spokesperson described the invitation from Pyongyang as 'a welcome step we hope will lead to . . . in the near future the return of full fledged IAEA inspections'. The IAEA has announced that, even with the full co-operation of North Korea, it would take at least three to four years to verify that all nuclear materials had been comprehensively declared. Meanwhile, the Bush administration has announced that it will continue to implement the 1994 Agreed Framework, even though it does not intend to certify to Congress that North Korea is abiding by the accord.
- An IAEA team of seven experts inspected stocks of low-enriched, natural and depleted uranium at the Iraqi nuclear facility at Tuwaitha. The annual inspection took place from 26–30 January 2002 and is part of Iraq's safeguards agreement with the Agency. Team leader Anrezey Petruzewski stated that the Iraqi authorities provided 'all the help that [was] necessary to perform the inspections'.
- The IAEA Board of Governors met from 18–21 March and approved, in principal, an action plan to improve protection against nuclear terrorism. The plan, which is based on a report by Director General Mohamed ElBaradei, calls for US$12m to be contributed annually by state parties to a special fund. The money will be used to support activities in eight areas. Most of the money will be spent on improving the physical protection of nuclear material and nuclear facilities, the detection of 'malicious' activities involving nuclear materials, improving state systems for nuclear material accountancy and control and security of nuclear material. Australia, Japan, Netherlands, Slovenia, the UK and the US—and the Nuclear Threat Initiative, a private foundation (see *Trust & Verify*, no. 100)—have already made financial commitments and other states have announced contributions in kind. During the meeting, the Agency also argued that it needs an extra US$20m per year for urgent security upgrades at nuclear facilities.

**Source** 'IAEA officials to visit nuclear laboratory in North Korea', *The Korea Herald*, 8 January 2002; 'IAEA team to visit North Korean nuclear facilities', *IAEA Press Release*, PR 2002/1, Vienna, Austria, 10 January 2002; Karen Boyd, 'North Korea: IAEA officials complete visit to isotope laboratory', *Global Security Newswire*, 23 January 2002, www.nti.org; 'North Korea: Bush will refuse to certify compliance, officials say', *Global Security Newswire*, 20 March 2002, www.nti.org; 'Iraq co-operated with nuclear inspection—IAEA', *Reuters*, 31 January 2002; Lothar Wedekind, 'IAEA team concludes inspections in Iraq', *IAEA FrontPage News*, 31 January 2002, www.iaea.org; 'Protection against nuclear terrorism: specific proposals', GOV/2002/10, Vienna, Austria, 5 February 2002.

## More is less—Bush policy on global warming

Nearly a year after the US rejected the 1997 Kyoto Protocol to the 1992 United Nations Framework Convention on Climate Change (UNFCCC), the administration has finally come up with its long promised domestic policy on global warming. In an announcement on 14 February, President George W. Bush set a voluntary target to reduce US greenhouse gas (GHG) intensity —a ratio of emissions to economic output measured by gross domestic product—by 18 percent over the next decade. However, this linguistic trickery obscures the fact that this will allow actual emissions to rise with economic growth on a 'business as usual' trajectory.

This growth in actual emissions will breach the US legal commitment under the UNFCCC to reduce greenhouse gas emissions to 1990 levels. Furthermore, this new policy takes a contrary approach to the Kyoto Protocol, currently being adopted by the rest of the world. Under the protocol, the US would have been required to reduce its emissions to eight percent below 1990 levels by 2012. The new US strategy will allow for a 30 percent rise in the same period.

In addition to the intensity target, the new policy provides for an expansion of the existing voluntary reporting programme for US companies. Yet, in 2000, only about four percent of total US GHG emissions were reported under this scheme. It also lacks credibility due to the absence of common methodologies and independent verification for ensuring the accuracy and reliability of data.

**Source** UN Wire, www.unfoundation.org, 15 February 2001.

## Fish stocks agreement enters into force

The 1995 United Nations Agreement on Straddling Fish Stocks and Highly Migratory Fish Stocks (commonly known as the Fish Stocks Agreement) finally entered into force on 11 December 2001, 30 days after Malta became the thirtieth signatory to deposit its instrument of ratification with the UN. Although the agreement has entered into force, its effectiveness hinges on the six key deep-water fishing fleet states, accounting for an estimated 90 percent of the world fishing catch, joining the regime: Japan, Poland, Russia, South Korea, Spain and Taiwan. Apart from Poland, all of these countries have signed the accord. Russia is the only one to have ratified it. Negotiation of the treaty began in 1993 as a direct outcome of the 1992 Earth Summit, which called on states to convene a conference to promote implementation of the 1982 United Nations Convention on the Law of the Sea (UNCLOS) in relation to trans-boundary fish stocks.

Amid fears that over fishing is decimating global stocks, the Fish Stocks Agreement calls on parties to work through regional organisations—which they are obliged to join as the price for fishing in these areas—to set fishery targets. States are obliged to co-operate with each other via these regional regimes in order to collect and disseminate scientific data on fish stocks and to establish mechanisms for 'effective monitoring, control, surveillance and enforcement'. As an overarching principle, the treaty requires parties to adopt a precautionary approach to conservation and stock management and sets out rules for enforcement and the settlement of disputes.

In a move away from previous fisheries agreements, which grant enforcement responsibilities exclusively to the flag state of fishing vessels, the Fish Stocks Agreement also gives powers to regional fisheries organisations, other member states of these organisations and port states that have joined the agreement. Where violations are detected and evidence is secured, the inspecting party is obliged to inform the flag state of the ship, which has three days to respond, indicating whether it will take enforcement action or authorise the inspecting state to do so on its behalf. In the event of disagreement, parties to the agreement may use the dispute settlement procedures laid out in UNCLOS, even if they have not joined that treaty.

**Source** UN Wire, www.unfoundation.org, 12 December 2001.

## Landmines: discussing compliance

Representatives of states parties, non-governmental and international organisations met in Geneva, Switzerland, from 28 January to 1 February to discuss implementation of the Ottawa Convention. This was the most widely attended Intersessional Standing Committee meeting for the treaty to date. Progress since the Fourth Meeting of States Parties, held in Managua, Nicaragua, in September 2001, was discussed in each of the four committees that focus on substantive and operative issues relating to the treaty. Discussion of non-compliance concerns centred on the allegation of landmine use by Uganda in the Democratic Republic of Congo in 2000, a claim first raised at the Managua meeting. While Uganda has consistently denied that its forces used mines after joining the treaty in 1999, it announced that it had initiated an investigation of the allegation. This further reduced the willingness of states parties to instigate the compliance clarification measures provided for under the treaty, which have never been used. However, they will be expecting a report on the investigation's findings at the next intersessional meeting in May 2002. Meanwhile, Canada received support to continue developing consensus proposals

for establishing procedures for implementing the treaty's compliance provisions.

**Source** Stephen Goose, Head of ICBL Delegation, 'Statement of the International Campaign to Ban Landmines to the Third Meeting of States Parties to the 1997 Mine Ban Treaty', September 2001, www.icbl.org; 'Oral statement by the representative of Uganda to the Intersessional Meeting on the Status and Operation of the Convention', 1 February 2002; Canadian Department of Foreign Affairs and International Trade, 'A dialogue on the facilitation and clarification of compliance', *Non-paper,* January 2002, www.gichd.ch.

## Movement over Iraq inspections

As the US and the UK step up pressure on Iraq to comply with its obligations to admit inspectors from the United Nations Monitoring, Verification and Inspection Commission (UNMOVIC), the Commission has developed a 300-page binder on 100 unresolved questions remaining after the seven years of inspections by the United Nations Special Commission (UNSCOM). The information used to compile the questions, including old inspection reports, the testimony of defectors, satellite photographs and previous Iraqi declarations, is being entered into a searchable database. However, France and Russia have demanded that UNMOVIC must scale down the list to focus on the core issues that Iraq must address in order for UN sanctions to be lifted. Meanwhile, Iraqi officials held talks in March with UN Secretary-General Kofi Annan on the resumption of inspections—UNMOVIC Executive Chairman Hans Blix was present for the first time. Further meetings are scheduled for April. It is not clear, though, whether these are simply a ruse by Iraq to buy time in the hope that US pressure for a military assault will wane, or a realisation by Baghdad that only through the readmission of inspectors and the granting of unlimited access will it have any hope of preventing such an attack entirely.

**Source** 'Iraq II: UNMOVIC prepares for inspections', *Global Security Newswire,* 21 February 2002, www.nti.org; David Albright and Kevin O'Neill, 'The Iraqi maze: searching for a way out', *The Nonproliferation Review,* November/December 2001, www.cns.miis.edu.

## CTBT news

- Progress is being made towards completing the 321 International Monitoring System (IMS) stations. At the end of 2001, 24 stations were certified, including 10 auxiliary seismic stations. One hundred and twenty two stations, representing more than one-third of the global network, were complete or substantially met treaty specifications.
- During the seventeenth session of Working Group B of the Preparatory Commission for the CTBT Organisation (PrepCom), which took place from 4–21 February 2002, the Chinese delegation raised the issue of the cost of post-certification operation of IMS stations. The matter will be studied by state parties, with the assistance of the Provisional Technical Secretariat (PTS) in preparation for the next PrepCom session on 9–12 April 2002. Reducing station readiness and data availability have potentially serious implications for test ban verification.
- China and Iran have stopped transmitting IMS data to the International Data Centre in Vienna, Austria. The reasons are unclear. China reportedly has not completed its own national data network for data transmission to Vienna. Teheran is said to have difficulties with national implementation legislation allowing the release of data. Some observers suspect that the new policies may be politically motivated.
- The Bush administration has requested US$18.2m in its Fiscal Year 2003 budget proposal for the development of the IMS. This is a reduction of US$1.8m compared to last year and reflects the August 2001 US announcement that it will not fund those parts of the PrepCom's work that are related to the development of provisions for on-site inspections.
- A December 2001 report by the Department of Energy identified delays in conducting certain reliability tests of existing nuclear warheads. As a result—and based on recommendations contained in the classified Nuclear Posture Review—the Bush administration has requested US$15m as part of the Fiscal Year 2003 budget to increase readiness at the Nevada Test Site. Washington now wants to be able to resume testing within 18 months, whereas it previously assumed preparation time of 24–36 months.
- Indian and US officials have dismissed Pakistani claims that India might have conducted a nuclear test. While visiting Washington in mid-February, Pakistani President Pervez Musharraf is reported to have said that 'there were certain indications [of a recent nuclear test] and I did share this information, yes, with the US leadership. I can't give conclusive evidence of it but I thought, if at all there is a possibility, it should be checked'.

**Source** Private communication; Carol Giacomo, 'China, Iraq said balking at test ban pact cooperation', *Reuters,* 7 March 2002; Walter Pincus, 'Report finds shortcomings in energy dept. arms testing', *Washington Post,* 3 January 2002, p. A15; David Ruppe, 'US testing I: no live testing needed for now, US official testifies', *Global Security Newswire*, 15 February 2002, www.nti.org; 'Bush requests funds for CTBT monitoring', *Arms Control Today,* March 2002, www.armscontrol.org; 'US says Pakistani nuclear charge baseless', *Reuters,* Washington, DC, 12 February 2002; 'India: we will not test nuclear weapons, official assures EU', *Global Security Newswire*, 15 February 2002, www.nti.org.

## Attempt to oust OPCW head fails so far

The US has launched an increasingly virulent campaign to remove José Mauricio Bustani, the Brazilian Director-General of the Organisation for the Prohibition of Chemical Weapons (OPCW), which verifies compliance with the 1993 Chemical Weapons Convention (CWC). The US has openly accused Bustani of managerial incompetence, including financial mismanagement, the demoralisation of staff and 'ill-considered initiatives'. Bustani has refused to resign, claiming that the US move is illegal and an assault on multilateral arms control. On 22 March, a no-confidence motion tabled in the OPCW's Executive Council failed to achieve a two-thirds majority, as did a Brazilian motion to resolve the issue through negotiations and an outside audit of the OPCW. The Council was seriously divided, with Canada, Japan, Nigeria, Poland, South Korea and most of the EU countries voting in favour of the US motion. Brazil, China, Cuba, Iran and Russia voted against the motion, while France, India, Mexico, Pakistan and South Africa abstained. The US is seeking a meeting of all states parties to the CWC, in April, to vote on a further no-confidence motion.

Meanwhile, more than 100 member states have failed to pay their dues to the OPCW, including France, Germany, Iran, Japan, South Korea and, paradoxically, the US. The US refusal to pay its dues on time and to agree to an increase in the organisation's budget have contributed to the current financial crisis. It has been revealed that the US will also fail to comply with its obligation under the CWC to destroy its chemical weapon stockpile by April 2007. This is due to stringent US environmental regulations and technical difficulties in draining agents from old chemical weapons set for destruction. Russia will not only miss its destruction deadline, but it has not even begun its destruction programme, partly due to environmental concerns, but also because of organisational and funding difficulties. The US has agreed to provide US$50m in the current financial year to assist Russia, including with the building of its Shchuchye destruction plant.

**Source** 'Russia: United States to provide $50 million CW destruction', *Global Security Newswire,* 30 January 2002, www.nti.org; Seth Brugger, 'US to miss Chemical Weapons Convention deadline', *Arms Control Today,* November 2002; 'CWC: OPCW wants unpaid dues', *Global Security Newswire,* 15 January 2002, www.nti.org; 'CWC: US to seek special conference if Bustani stays', *Global Security Newswire,* 25 March 2002, www.nti.org.

# *Peace Missions Monitor*

## International monitoring of Zimbabwe election a mixed blessing

International monitoring of the Zimbabwe presidential election on 9–11 March resulted in widely different assessments. (The European Union withdrew its observer team before the election when the Zimbabwean government refused to accredit its head, Pierre Schori of Sweden.) The Commonwealth Observer Group was scathing, saying that the poll was held in a climate of fear and could not be considered free and fair. Its report was key to the Commonwealth decision to suspend Zimbabwe from the organisation for one year. Meanwhile, the South African observer mission discredited itself by claming, contrary to the Commonwealth report, that the re-election of President Robert Mugabe was based on a free and fair vote. The Organisation of African Unity dented its reputation by agreeing with this conclusion, despite the overwhelming evidence of wrong-doing by the Zimbabwean government, including intimidation of voters, early closure and poor organisation of polling stations in and around the capital of Harare and the blatant attempt to stop opposition leader Morgan Tsvangirai from contesting the election by charging him with treason.

**Source** BBC News Online, 19 February, 12, 13 and 14 March 2002, www.bbc.co.uk.

## African peace monitors to Chad

The Community of Sahelo–Saharan States (CEN–SAD) agreed at a meeting in Syrte, Libya, to dispatch approximately 150 observers to monitor the border between the Central African Republic and Chad. An advance party of 50 Sudanese monitors is already stationed in the capital of the Central African Republic, Bangui. The deployment follows the conclusion of a peace agreement, brokered by Libya in January, which ended a three-year civil war between the Chad government and the rebel Movement for Democracy and Justice in Chad.

**Source** *Jane's Defence Weekly,* 16 January 2002, p. 18 and 27 March 2002, p. 27; Integrated Regional Information Networks News, United Nations Office for the Coordination of Humanitarian Affairs, www.irinnews.org, 20 February 2002.

# Science & Technology Scan

## Mini batteries go nuclear

James Blanchard, an associate professor of nuclear engineering at the University of Wisconsin, has developed a prototype of a miniature nuclear battery. Unlike conventional batteries, which use a chemical reaction to generate electricity, the prototype uses tiny amounts of the radioactive version of nickel (Nickel-63), which decays by emitting high-energy electrons, or beta particles. These are collected in a semiconductor material that converts their energy into electricity. At this stage of the US$450,000 project—funded by the US Department of Energy—the prototypes can yield nanowatts, or billionths of a watt of power. However, the inventor hopes that, with increased efficiency, this may soon be increased to microwatts (millionths of a watt). Other advantages over conventional batteries include increased longevity and a reduction in maintenance costs. It is hoped that these characteristics can be used to power a full range of verification systems and sensors, specifically micro-sensors.

**Source** Ann Eisenberg, 'Nuclear power holds the promise of tiny batteries', *International Herald Tribune,* 17 January 2002, p. 11.

## It is a UAV, but not as we know it

A radical new design of an unmanned aerial vehicle (UAV) recently passed its first wind tunnel tests. The SiMiCon Rotor Craft (SRC) combines vertical takeoff and landing, high speed horizontal flight and the ability to hover like a helicopter. This would present distinct advantages over conventional UAVs, which need standard airstrips for take off and landing. The SRC can take off vertically from the back of a flatbed truck, making it an ideal monitoring tool in inaccessible locations. Future uses could include police surveillance, terrain mapping and pollution monitoring.

**Source** 'Torque it up', *New Scientist,* 2 February 2002, p. 20.

## Satellite monitoring: bigger, better, more

Over the past few months there has been a flurry of new satellite launches and announcements, most in the environmental and commercial sectors. The European Space Agency successfully launched ENVISAT on 1 March. The £1.4 billion spacecraft weighs 8,000 kilogrammes and is 10 metres long. ENVISAT is the largest and most complex earth observation satellite ever developed; it is the culmination of a decade of research and development. Sitting in a polar orbit 800 kilometres above the earth, ENVISAT has been described as an important health check for the planet. Over its five-year operational lifetime, 10 on-board scientific instruments will collect data about land, oceans and the atmosphere. This data will be instantly available on the internet, free of charge to academic researchers around the world. It will be used to investigate global warming and the depletion of the ozone layer, as well as measuring land movements, changes in the ice-caps, vegetation coverage and the composition of the atmosphere.

The Japanese space agency is hot on the heels of Europe with the planned launch of the Advanced Earth Observing Satellite II (ADEOS-II) in October 2002. Part of its payload will be a controversial whale tracking system, designed to resolve the ongoing debate over Japan's whaling programme. Japanese researchers claim that whale stocks are sufficient to warrant 'scientific' hunting; the International Whaling Commission disagrees. Critics believe that culling may increase if the new satellite tracking system is abused. Hundreds of whales will be tagged with titanium pins shot into their blubber and connected to external measurement probes. These will collect data on their migratory patterns and acoustics and will record pressure, temperature and geomagnetic measurements during their dives. All of this data will be transmitted to the satellite when the whale re-surfaces.

On 18 October 2001, the QuickBird satellite was launched by the US company, DigitalGlobe. The satellite has started relaying images showing objects with a resolution of up to 61 centimetres for black and white (panchromatic) and 244 centimetres for colour (multispectral) imagery. According to Digital Globe, this is the highest quality commercial satellite imagery currently available. French engineers are putting the finishing touches to a Spot-5 satellite that will be launched in April. As well as providing commercially available, high resolution images, it will also be used to track natural disasters and undertake crop and vegetation surveys.

**Source** 'Huge satellite goes into orbit', 1 March 2002, 'Japan's whale-seeking satellite, 8 January 2002; 'Non-military satellite views earth', 11 January 2002; 'French prepare powerful eye in sky', 24 January 2002, BBC News Online, www.bbc.co.uk; 'DigitalGlobe (TM) successfully launches QuickBird imaging satellite', *DigitalGlobe Press Release,* Longmont, Colorado, 18 October 2001, www.digitalglobe.com.

VERTIC News & Events

## VERTIC/Wilton Park conference

From 22–24 February VERTIC held its third joint conference with Wilton Park, this time on the subject of 'Verification and Non-Cooperation'. The Cooperative Monitoring Center at the Sandia National Laboratories in Albuquerque, New Mexico, was also a co-sponsor. The conference addressed the issue of how verification might be carried out in situations in which states are, to varying degrees, uncooperative or obstructionist. More than 40 participants attended the conference. For a report on the conference contact the Administration Office, Wilton Park, e-mail: admin@wiltonpark.org.uk.

## Chemical Weapons Convention project

VERTIC has begun a new research project on the implementation of the CWC since its entry into force in 1997, including the operation of the Organisation for the Prohibition of Chemical Weapons. The project is being undertaken by Joan Link, who is on secondment from the UK Foreign and Commonwealth Office (FCO). VERTIC will produce a report on the key issues, along with recommendations for consideration by CWC states parties at their First Review Conference, which is to be held in The Hague in 2003.

## Grant for Landmine Project

VERTIC has been awarded a grant of £30,000 from the Diana, Princess of Wales Memorial Fund for its project on the Article 8 compliance provisions of the 1997 Ottawa Convention banning anti-personnel landmines. A highlight of the project will be the production of a Guide to Fact-Finding Missions to assist states parties in planning to receive such missions. The one-year project will be undertaken by Angela Woodward, VERTIC's Legal Researcher.

## VERTIC CTBT seminar in Vienna

On 18 March VERTIC hosted a seminar on 'CTBT Verification: Achievements and Opportunities' at the Vienna International Centre as part of a day of events to mark the fifth anniversary of the establishment of the Provisional Technical Secretariat (PTS) for the Comprehensive Nuclear Test Ban Treaty Organisation (CTBTO). The meeting was opened by the Austrian Minister for Foreign Affairs, Dr Benita Ferrero-Waldner. The speakers were: the Russian Ambassador to the international organisations in Vienna, Grigory V. Berdennikov; the head of the Seismological Division of the Royal Netherlands Meteorological Institute, Dr Hein Haak; and the Executive Director of the Arms Control Association in Washington, DC, Daryl Kimball. The seminar was attended by more than 100 participants. A report on the seminar and the text of the interventions made are available on the VERTIC website.

## Staff news

**MOLLY ANDERSON**, along with Trevor Findlay, met with VERTIC board members Joy Hyvarinen and Owen Greene on 7 January to discuss future priorities for VERTIC's environment programme. Since then she has prepared a work plan for a new project on greenhouse gas inventories. Along with Vanessa Chagas, Molly attended a United Nations Environment and Development UK meeting on 22 January on Britain's contribution to the World Summit on Sustainable Development, which is to be held in Johannesburg, South Africa, in August/September 2002. On 4 February she met with the staff of Scidev.net to discuss a future article on the summit. She also had an informal meeting on 10 January with Mark Kember of the World Wildlife Fund to discuss emissions trading and future areas of interest for VERTIC's work.

**VANESSA CHAGAS** joined VERTIC as an intern in late January. Originally from Portugal, she has a Masters degree in Political Behaviour from the University of Essex, UK. She is researching the mechanisms for reviewing progress on the various Agenda 21 items that will be considered at the World Summit on Sustainable Development. She has also been assisting with general office tasks. On 19 March she attended the opening of a new climate change exhibition at the Science Museum in London.

**TREVOR FINDLAY** addressed by phone-link a meeting in Ottawa, Canada, on 8 January—organised by the Canadian Network to Abolish Nuclear Weapons—to analyse a proposed reporting system for the 1968 Nuclear Non-Proliferation Treaty (NPT). He spoke on the various existing models for treaty monitoring and how they might be applied to the NPT. From 25–28 January he attended various meetings in Vancouver, Canada: a gathering of the Canadian Human Security Network and planning meetings for the new Simons Centre for Peace and Disarmament at the University of British Colombia. On 1 February he chaired

a meeting between VERTIC and the British American Security Information Council (BASIC) to discuss future co-operation. On 11 February he attended a Workshop on Gender and Early Warning at International Alert in London. Along with Oliver Meier, he participated, on 14 February, in a meeting of non-governmental organisations (NGOs)—funded by the Joseph Rowntree Charitable Trust and hosted by Saferworld—to examine the effects of 11 September on NGO plans and activities. On 18 February he attended a seminar by Henry Sokolski, Executive Director of The Nonproliferation Policy Education Center in Washington, DC, at the Centre for Defence Studies, King's College London, on the Agreed Framework for North Korea. From 22–24 he chaired the case study sessions at the VERTIC/Wilton Park Conference and gave a paper on 'Making verification smarter'. He had a chapter entitled 'The role of monitoring and verification' published in Colin McInnes and Nicholas J. Wheeler (eds), *Dimensions of Western Military Intervention,* Frank Cass, London, 2002.

**BEN HANDLEY** introduced new electronic forms into VERTIC's administration and assisted in preparing budget estimates for funding applications.

**JOAN LINK** joined VERTIC in March on a six-month consultancy contract to research the implementation of the CWC. Joan is on sabbatical from the FCO where she previously held positions in the then Arms Control and Disarmament Department and was a member of the UK delegation to the Conference on Disarmament in Geneva.

**OLIVER MEIER** was interviewed on BBC World Television's *Asia Today* on the visit of IAEA's nuclear inspectors to North Korea on 15 January. He attended a seminar on 'Bio weapons: five decades of silence?' at Brunel University, University of London, on 18 January. On 25 January, he and Angela Woodward met with John Walker of the FCO's Arms Control and Disarmament Research Unit to discuss VERTIC's work on biological weapons control. On 5 February he met with staff of the Forschungszentrum Jülich in Germany, to discuss co-operation between VERTIC and the European safeguards community. From 6–8 February Oliver had meetings in Vienna with staff of the CTBTO, the IAEA and members of national delegations to the CTBTO PrepCom. On 16 February he facilitated a workshop on the CTBT at the 'Treaties Day School' at the London School of Economics and Political Science, organised by Abolition 2000 UK, Christian CND and Medact. From 22–24 February he attended the VERTIC/Wilton Park conference and gave a paper on 'The United States and non-cooperation with verification regimes'. On 18 March he chaired the VERTIC CTBT seminar in Vienna. Oliver also spoke to a meeting organised by the Vienna NGO Committee on Disarmament on 'Verification: the future of the CTBT and nuclear disarmament' on 19 March. He and Angela Woodward attended several meetings with NGOs and diplomats on biological weapons control in Geneva from 20–23 March, including a Geneva Forum meeting on 'Civil society monitoring: comparing experiences, exploring relevance to Biological Weapons'. He had an article on 'Civil Society and the Biological Weapons Convention: Creating Transparency Under Duress' published in the March 2002 issue of the *INESAP Information Bulletin*. Starting with this issue, Oliver has taken over as editor of *Trust & Verify* from Trevor Findlay.

## Fact-finding under the Ottawa Convention

The UK conducted its third practice inspection exercise in relation to the 1997 Ottawa Convention, which bans anti-personnel landmines, at a munitions storage facility in Devon from 28–31 January 2002. An observer day was scheduled for 29 January, when VERTIC and representatives of other non-governmental organisations and of the British armed forces were invited to attend all elements of the exercise. While Article 8 of the treaty provides for states parties to authorise 'fact-finding missions' (FFM) to clarify documented non-compliance concerns, the UK is the only state party known to be preparing for implementation of these provisions.

The mandate for the mock inspection required inspectors to investigate allegations that the UK was storing and transferring anti-personnel mine (APM) stocks that it had not declared in its transparency report and that it was conducting APM training in contravention of the defensive training permitted by the treaty. The exercise simulated key aspects of a FFM, including point of entry negotiations, managed-access inspections and clarification discussions.

Unlike other arms control treaties, the Ottawa Convention does not require states parties to establish a national authority to co-ordinate treaty implementation and verification provisions. However, the UK has set up a 'virtual' national authority, which took responsibility for managing the FFM exercise. The latter allowed personnel from the 'virtual' national authority, the inspection site, the FFM team and the UK's Joint Arms Control Implementation Group, which co-ordinates UK efforts related to the receiving of, and participation in, arms control inspections, to practice inspection modalities.

**Mirak Raheem** continued researching the monitoring role of the Temporary International Presence in Hebron and undertaking general administrative duties.

**John Russell** has been drafting an educational leaflet to be published jointly by VERTIC and the United Nations Association (UNA) of the UK on the verification of arms control and disarmament agreements. He has also been researching the 1992 Open Skies Treaty, including the future evolution of the accord now that it has entered into force. John attended a presentation by Martin Butcher of Physicians for Social Responsibility on 18 March at the Quaker Centre in London on new types of nuclear weapons and the war on terrorism. In addition, he represented VERTIC at a meeting of the Mountbatten Centre for International Studies/FCO Nuclear Non-Proliferation Study Group on 19 March.

**ANGELA WOODWARD,** along with Oliver Meier, attended a seminar by Clay Moltz of the Monterey Institute of International Studies on 'Future security in space: commercial, military and arms control trade-offs' at King's College London on 14 January. Angela met with Sue Wixley of the International Campaign to Ban Landmines on 21 January to discuss each organisation's respective landmine projects. On 29 January she participated in a simulated fact-finding mission to the UK under the Ottawa Convention. Angela attended the Intersessional Standing Committee meetings of the states parties to the Ottawa Convention on 31 January and 1 February in Geneva, where she gave presentations on VERTIC's Article 7 Guide and on its current Article 8 project. From 24–25 February Angela participated in the VERTIC/Wilton Park Conference. On 14 March she discussed developments in the conventional weapons area with Richard Lloyd of Landmine Action UK.

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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