Verifying Libya's nuclear disarmament

On 19 December 2003 Libya made the surprise announcement that it had decided to abandon its weapons of mass destruction (WMD) capabilities. The breakthrough apparently came in early October 2003 when American, British, German and Italian forces collaborated to intercept the German-flagged *BBC China,* which was carrying at least 1,000 fully assembled gas centrifuges and components. The vessel had picked up its cargo in Dubai, and was bound for Libya, before being diverted to the Italian port of Taranto for inspection. This may have been the straw that broke the camel's back, finally convincing Libyan officials that it was time to put an end to the country's WMD programmes. The Libyan government had already secretly approached the United Kingdom and the United States, in March 2003, to identify ways of doing this, presumably to obtain the maximum benefits in terms of international recognition and financial assistance.

Following negotiations with, and visits by, UK and US experts in 2003, Libya agreed to 'disclose and dismantle' all of its WMD programmes and 'immediately and unconditionally' to allow international inspectors to enter the country. It also agreed to destroy all missiles capable of carrying a 500-kilogramme payload with a range greater than 300 kilometres and to refrain from developing such missiles in future. In addition it said that it would sign an Additional Protocol to its International Atomic Energy Agency (IAEA) safeguards agreement, and comply with the 1972 Biological Weapons Convention (BWC), to which it is already a party. It has since acceded to the 1993 Chemical Weapons Convention (CWC) and the 1996 Comprehensive Nuclear Test Ban Treaty (CTBT).

This article will consider the nuclear aspects of Libya's WMD programmes and the role to be played by the IAEA in the verification tasks that lie ahead.

Libya's past known nuclear capabilities

The major known facility in Libya is the Tajoura Nuclear Research Centre (TNRC), which was developed with the assistance of the Soviet Union, beginning in 1982. It encompasses 15 facilities and laboratories, including the 10-megawatt (MW) Tajoura Research Reactor (TRR), a critical facility, a neutron generator and a TM4-A Tokamak fusion reactor. Other facilities include a radiochemical laboratory that supports isotope production activities and a nuclear metallurgy laboratory. The TNRC also has a physical research facility with laboratories for conducting research on nuclear physics, solid-state physics, neutron physics, material science and engineering, radiation biophysics and mass spectrometry. Many of these facilities contain hot cells that, theoretically, could be used to carry out spent fuel analysis and other research.

In this issue . . .

Jack Boureston, Yana Feldman and Charles Mahaffey assess Libya's WMD capabilities and related verification challenges, while Ben Mines examines developments regarding the Iraq Survey Group. Plus all of the usual features: Verification Watch, Science and Technology Scan, Peace Missions Monitor, Verification Quotes and VERTIC News and Events.

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New revelations

During the 1980s and 1990s, Libya built at least one pilot centrifuge facility and experimented with uranium enrichment technologies, the existence of which has just been publicly revealed. Before the IAEA became involved, American and British teams examined large amounts of 'specialised nuclear equipment and related documentation'. In December 2003, during meetings with the IAEA, Libyan officials conceded that the country had imported natural uranium and centrifuge and conversion equipment, and that it had constructed pilot-scale centrifuge facilities.

Libyan Foreign Minister Abd-al-Rahman Shalqam claims that the enrichment programme is on a laboratory scale: 'it isn't weaponisation'. According to Shalqam, the centrifuge facilities have been dismantled. During his December visit to 10 previously undisclosed nuclear sites in Libya, Dr Mohamed ElBaradei, Director General of the IAEA, confirmed that these centrifuge facilities had indeed been disassembled and put in boxes.

Libya and the nuclear black market

At present, no one country has been identified as the main supplier of nuclear technology to Libya, but all eyes are on Pakistan. In fact, Libya's nuclear imports appear to have come from a 'sophisticated black market'. While the government of Pakistan denies any sanctioned state-to-state transfers, state officials admit that Pakistani nuclear scientists may have independently shared equipment and expertise with Libya. According to an unnamed senior European diplomat who has had access to detailed intelligence, the Libyan programme had 'certain common elements' with Iran's enrichment programme, as well as with the apparent pattern of technology transfers from Pakistan to Iran. Iran's centrifuges use an aluminium rotor with a diameter of approximately 100 millimetres, similar to those that Pakistan acquired clandestinely in the mid-1970s. According to Western officials, these Iranian centrifuges have an annual production capacity of approximately two separative work units (SWUs). In addition to the centrifuges, Libya has admitted to importing equipment that would allow it to process uranium concentrate (yellowcake) into uranium tetrafluoride (UF_4) and uranium hexafluoride (UF_6).

Enter the IAEA

On 20 December 2003, at a meeting with IAEA representatives, the Libyan government pledged to eliminate 'materials, equipment and programmes which lead to the production of internationally proscribed weapons'. Days later, it agreed to sign an Additional Protocol to its existing safeguards agreement with the Agency, allowing for more thorough inspections of its nuclear facilities. By the end of December, ElBaradei had visited Libya to begin the verification process. His comment that Libya appeared to be at an early stage in realising its nuclear ambitions seemed to contradict the initial, more alarmist assessments of the UK and the US. Moreover, there appeared to be disagreement on the scale of the IAEA's role in verifying the extent of Libya's WMD capabilities and their dismantlement and destruction.

This matter appears to have been resolved with the January 2004 agreement that the Agency will work to verify and dismantle Libya's clandestine nuclear weapons programme, while the UK and the US will work to remove and/or destroy the various components. ElBaradei has said that the responsibility of the IAEA will be to 'verify that Libya's programme is properly dismantled, while the Americans and Britons would physically destroy the capabilities'. In addition, the UK and the US are working with Libya to destroy its chemical and biological weapons capabilities.

Verifying the Libyan programme

The IAEA has started work on a comprehensive plan to determine the extent of Libya's nuclear weapons programme and nuclear infrastructure. Agency representatives have said, however, that, even in advance of the plan being finalised, IAEA specialists are already in Libya to begin the verification process. More IAEA experts will join them in the coming weeks and months. Specific issues that will need to be addressed include those set out below.

The extent and origins of Libya's centrifuge programme and conversion facility. The IAEA must identify the sources of Libya's centrifuge technology, both to understand how far its capability had advanced and to discover who provided it. This will help the international community to halt such proliferation and to detect and freeze other enrichment programmes before they become operational.

The status of Libya's research reactor and radiochemistry laboratory located at the TNRC. Libyan scientists affiliated with these facilities are known to have studied radiochemistry properties and isotope production methods. Moreover, the TNRC's hot cells (up to 10 of them) may support a reprocessing capability that, although limited, could in theory produce enough material over time for a nuclear weapon.

The location, purpose, and status of any facilities that may be related to Libya's nuclear programme, whether they are for civilian or military purposes. According to initial Western

reports, American and British teams visited at least 10 facilities prior to Libya's announcement that it wished to rid itself of WMD. So far the IAEA has only visited four. What about the other six? Are there more?

The status of any nuclear materials in Libya's possession. Of particular concern is the 80 percent high enriched uranium (HEU) that the Soviet Union transferred to Libya to fuel its 10 MW research reactor at the TRNC. Furthermore, Libya reportedly acquired an enormous amount of yellowcake from Niger in the 1980s. Some or all of this may have been used in conversion and enrichment experiments, which, in turn, could have generated HEU. Alternatively, the yellowcake could have been converted into uranium pellets called targets, which could then have been irradiated and separated to obtain plutonium for a nuclear weapon.

Conclusion

Only long-term diligent verification by the IAEA and the international community will shed light on Libya's true nuclear capabilities and past intent. The Agency's current efforts in Libya, along with subsequent inspections and dismantlement programmes, should also result in an even more significant breakthrough: exposure of an international network of nuclear cooperation that has enabled Libya's nuclear infrastructure to develop as far as it has. Such a revelation would be an important victory in the international campaign to stem the spread of nuclear weapons technology.

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Peace Missions Monitor

Liberia: UN slows disarmament process

The UN has been forced to slow down the Disarmament, Demobilization, Rehabilitation and Reintegration Program in Liberia after being overwhelmed by the number of fighters who have come forward to hand over their weapons. More than 1,000 ex-combatants were turning up daily, instead of the 250 anticipated. The United Nations Mission in Liberia (UNMIL) may have to delay the programme by a month to permit it to improve conditions in the cantonment areas. Part of the problem has been that UN member states that pledged assistance for the programme have been late in meeting their commitments.

Successor observer mission in Bougainville

On 1 January 2004, a new United Nations Observer Mission in Bougainville (UNOMB) began operations in the Papua New Guinean province, replacing the former United Nations Political Office in Bougainville (UNPOB). The new mission will be smaller but will continue the work of its predecessor in monitoring and nurturing implementation of the August 2001 Bougainville Peace Agreement. A critical step was taken in August 2003 with the completion of Stage II of the weapons disposal plan. More than 1,900 weapons were placed in 16 containers and trunks—each locked with two keys, one held by the respective rebel commander and one by UNPOB—pending a final decision on the fate of the arsenal. This move allowed the Papua New Guinean government, as agreed under the peace accord, to enact the Constitutional Amendment and the Organic Law on Peace Building on Bougainville, which will facilitate the drafting of a Bougainville Constitution, the delegation of powers and functions to a Bougainville interim provincial government, and elections for an autonomous government for the region. Meanwhile, the Australian-led Bougainville Transition Team was withdrawn at the end of December 2003 in view of the progress being made.

Ethiopia rejects part of Demarcation Commission decision

The UN Security Council has expressed disappointment over Ethiopia's rejection of parts of the 2002 ruling by the neutral Demarcation Commission regarding the border between Ethiopia and Eritrea. The two countries fought a bitter territorial war between 1998 and 2000. The commission was established as part of the peace process outlined in the December 2000 Comprehensive Peace Agreement signed in Algiers, Algeria. Eritrea, for its part, was criticised by the Security Council for the sharp increase in the restrictions it has placed on the movement of personnel of the United Nations Mission in Ethiopia and Eritrea (UNMEE), which is monitoring and facilitating the peace process. UN Secretary-General Kofi Annan has volunteered his 'good offices' to help resolve the difficulties, but he has made it clear that this does not absolve the two sides of using the existing peace mechanisms to sort out their differences.

Source 'UN forced to slow disarmament process in Liberia', UN Wire, 15 December 2003; UN Security Council Press Release, SC/7952, 15 December 2003; Press statement on Ethiopia, Eritrea by Security Council President, SC/7972, 7 January 2004.

Iraq Survey Group emerges empty-handed

After more than seven months of searching, the United States-led Iraq Survey Group (ISG), comprising weapons and other experts from Australia, the US and the UK, has found no evidence of weapons of mass destruction (WMD) in Iraq. David Kay, the Special Advisor for Strategy on Weapons of Mass Destruction and the Coordinator of ISG activities, declared in his 3 October 2003 interim report to the US government that there was no evidence of active chemical or nuclear weapons programmes or of biological weapons (BW) production. Nor have any stockpiles of WMD been discovered. However, there was evidence of WMD-related programmes and of dual-use equipment that had been concealed from United Nations (UN) inspectors. The finds included a vial of a reference strain of botulinum toxin, allegedly imported legally from the US in the 1980s. But there is some doubt as to whether such a strain could be used as a biological weapon. Kay also suggested that Iraq had compartmentalised its former BW programme to maintain a smaller capability that could be reactivated at short notice. He alleges that the Iraqi intelligence service ran a covert network of biological laboratories and safe houses and that Iraqi scientists conducted research on BW-applicable agents, such as aflatoxin, brucella, Congo Crimean hemorrhagic fever, and ricin, none of which were reported to the United Nations Monitoring, Inspection and Verification Commission (UNMOVIC).

It is becoming apparent that WMD stockpiles are now unlikely to be unearthed. The discovery in January 2004, by Danish troops, of 36 mortar shells that preliminary tests showed contained blister agent, turned out to be a false alarm: subsequent tests showed no CW present. A Carnegie Endowment for International Peace report released that month suggested that Iraq's nuclear programme had been dismantled and that its chemical weapons capability was effectively non-existent. Instead it appears that Iraq focussed on preserving a dual-use capability rather than on weapons production. The view that is becoming more generally accepted is that while Iraq had a clear intention to resume WMD production once UN sanctions were lifted and weapons inspectors had left the country, it did not have the means, following years of sanctions and inspections, to pursue its ambitions. The threat, therefore, lay not in the weapons or in the capacity to acquire them, but in Iraq's desire to acquire them.

The exception was its work on long-range missiles. Reports suggest that Iraq intended to restart the missile programme first, as these would take the longest to develop. Former Iraqi Deputy Prime Minister Tariq Aziz has told US forces that Iraq did not possess WMD, but had ordered the commencement of several secret programmes to develop or purchase long-range ballistic missiles. Yugoslav missile experts are alleged to have travelled to Iraq in 2001 to help extend the range of Iraqi missiles beyond the permitted 150 kilometres (kms) by attaching several rockets together. It is also alleged that Yugoslavs and other foreign experts even worked in Iraq into 2003. In addition, Iraq is said to have paid North Korea US$10 million for technologies for a 1,300 km missile, although North Korea never honoured the deal because of US pressure.

Why did Iraqi President Saddam Hussein opt not to prove to UN inspectors that his country had no WMD? Perhaps it was in order to gain international respect stemming from Iraq's presumed possession of such capabilities. Perhaps it was because he was unaware of the status of his country's WMD capabilities: leaders of authoritarian regimes are often shielded from the truth by fearful minions. Saddam's capture by US forces in December 2003 initially offered some hope that the full extent of Iraq's past efforts to develop WMD would be revealed. It is now more likely that he will help to confirm that Iraq destroyed all of its WMD following the 1990–91 Gulf War.

Evidence is also mounting to rule out claims that Iraqi WMD stocks were transferred either to terrorist groups or neighbouring countries. A report in November 2003 by Anthony Cordesman of the Center for Strategic and International Studies in Washington, DC, compiled from ISG briefings, states that no evidence has been found to prove that Iraq transferred any such weapons to terrorist groups. Elsewhere, Condoleezza Rice, the US National Security Advisor, has said that there is also no evidence that Iraq transferred WMD to Syria.

Some former members of the ISG have complained that the body is poorly organised and over-funded, allegedly spending extravagant amounts on air-conditioned trailers, new computers and even a sprinkler system for a lawn. So far, the total cost of the search by the US for WMD is US$1 billion. Additional funding approved by the US Congress was supposed to increase the size of the ISG by 200 personnel to 1,400, although this is

now unlikely to be needed. Although it had been estimated that the ISG would need another six to nine months to complete the investigation, the search for weapons may already be winding down. The US has reportedly ordered the group to shift its attention away from WMD towards identifying and locating terrorist and armed opposition groups. A number of US intelligence experts and linguists from the ISG are to be reassigned to counterinsurgency missions. The 400-strong, Australian-led Joint Captured Material Exploitation Team (JCMEG)—a military team responsible for finding military equipment—has now been withdrawn from Iraq and there are suggestions that the ISG has been reduced to only a few hundred specialists. Kay has also reportedly asked to step down from his post before the group submits its final report and could leave before the next interim report is due in February 2004.

Meanwhile, Dr Mohamed ElBaradei, Director General of the IAEA, has asked for UN weapons inspectors to be allowed to return to Iraq as soon as possible to fulfil their verification mandate. He also asked for a copy of Kay's classified interim report, but the US has thus far refused his requests. Neither UNMOVIC nor the IAEA can verify any claims made by the ISG as they have not received any information other than what Kay has released publicly. In particular they cannot determine if the ISG has found evidence of previously unknown WMD-related activities.

Despite its absence from the country since March 2003, UNMOVIC continues to review its data on what is known about Iraq's weapons programmes, as well as considering the long-term monitoring requirements now that sanctions have been lifted and the environment in Iraq has changed. UNMOVIC still has a mandate to carry out Ongoing Monitoring and Verification (OMV) to ensure that Iraq does not continue to develop WMD and it is best placed to establish a legitimate, intrusive inspection system that will outlast the US-led occupation of the country. For now UNMOVIC has been reduced in size to 51 core staff, but approximately 350 experts remain on its roster of inspectors. It has even maintained training programmes on techniques and equipment used in the field. UNMOVIC has also started to prepare a compendium of the experience and knowledge that it has gained, particularly from multidisciplinary inspections in Iraq.

There may still be a future for UNMOVIC beyond Iraq. The European Union (EU) has agreed a WMD action plan that seeks to preserve the unique capabilities of UNMOVIC in some form. France, Russia and the United Kingdom have been reportedly considering how the Security Council might authorise the preservation of UNMOVIC's capabilities and experience beyond Iraq in a way that is acceptable to the US. The Working Group on Biological Weapons of the Federation of American Scientists (FAS) has suggested that UNMOVIC be used to complement the work of existing verification organisations for chemical and nuclear weapons (the Organization for the Prohibition of Chemical Weapons (OPCW) and the IAEA respectively) and help to resolve future compliance crises in relation to biological weapons and missiles.

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Verification Quotes

'He might need tagging and satellite surveillance'.
UK Home Secretary David Blunkett, referring to the readmission of London Mayor Ken Livingstone ('red Ken') to membership of the Labour Party, quoted in *The Times,* 7 January 2004, p. 1.

'. . . using highly professional people who have good staffing behind them, who know the facts and who over the years painstakingly built up relations—not necessarily very warm ones, but credible ones—with difficult people in various countries. That gives them a real, marked advantage over your average American politician . . .'. The North Koreans 'know that there's going to be a point when George Bush is gone, but the ElBaradeis go on forever'.
American international lawyer Professor Thomas M. Franck, explaining the advantages of having experienced heads of international verification organisations, such as Dr Mohamed ElBaradei, Director General of the IAEA, when dealing with difficult proliferation issues like that of North Korea. Quoted by Barbara Crossette, 'IAEA chief out front on arms control', UN Wire, 7 January 2004, www.unwire.org.

'Among ourselves, we think our inspection system is the lowest in the world'.
Unnamed manager in the US Department of Agriculture commenting on the discovery of the first official case of 'mad cow' disease in the US, quoted in Suzanne Goldenberg, 'Culture of indifference leaves America open to BSE', *The Guardian,* 12 January 2004, www.guardian.co.uk.

'That sort of thing is verifiable, after all. Saddam's people could have gone to check if they had the tube of anthrax or whatever weapon they claimed to have'.
Unnamed US intelligence source commenting on speculation that Saddam was hoodwinked by his officials into believing that Iraq really did possess weapons of mass destruction, quoted in Richard Norton-Taylor and Julian Borger, 'New theory for Iraq's missing WMD: Saddam was fooled into thinking he had them', *The Guardian,* 24 December 2003, p. 1.

'. . . she told me that she had been trying to call me to verify the news that her dad had been caught. I told her "Um Ali, I am afraid the news is correct . . .".
Saed Silawi, Middle East correspondent for the Arabic satellite television channel al Arabiya, reporting how Saddam's daughter Raghad found out that her father had been captured, quoted in *The Times,* 15 December 2004, p. 3.

Verification Watch

North Korea: new talks planned

A new round of six-nation talks on North Korea's nuclear weapons programme is expected to be held in Beijing, China, in early 2004, although no formal announcement has yet been made. The talks, involving China, Japan, North Korea, Russia, South Korea and the US, follow those held in August 2003 and are aimed at resolving the impasse between North Korea and the US. Washington wants North Korea to abandon its nuclear weapons programmes. In return, Pyongyang wants the US to conclude a non-aggression agreement with North Korea, and to provide it with financial assistance and food aid. However, there still remains intense speculation about North Korea's nuclear capability, which may now comprise as many as eight weapons that the North Koreans judge as useable without testing. (Notwithstanding this claim, South Korea and the US have agreed to set up 40 monitoring stations in the south to detect a North Korean nuclear test).

A private delegation of US nuclear and foreign policy experts was invited to visit nuclear sites in North Korea in early January. The visit included a tour of Yongbyon, a key nuclear site previously under IAEA safeguards. The delegation was allegedly shown weapons-grade plutonium in order to demonstrate North Korea's nuclear capability. However, the group, which included Dr Sigfried Hecker, former director of the Los Alamos nuclear weapons laboratory, John W. Lewis, emeritus professor of international relations at Stanford University, and former US State Department Korea expert Jack Pritchard, made clear that it was not an inspection team and in no sense could its visit be described as a verification exercise.

North Korea is apparently ready to dismantle its nuclear weapons programme. In return for the conclusion of a non-aggression pact with the US, North Korea now says that it would rejoin the 1968 Nuclear Non-Proliferation Treaty (NPT) and allow IAEA inspectors to re-enter the country. However, while both the US and North Korea appear to have agreed in principle to these demands, problems remain over the concept of simultaneity. North Korea is insisting on receiving food aid and on the resumption of supplies of heavy fuel oil before declaring its intention to end its nuclear activities, which would then only occur after the signing of a non-aggression pact. Such a schedule is unlikely to be workable for the US. For its part, the US might offer non-aggression assurance in two stages: an agreement that lasts for the duration of the six-nation talks; and a long-term deal that would only take effect after North Korea ends its nuclear activities.

Meanwhile, the Korean Peninsula Energy Development Organization (KEDO) announced on 21 November 2003 that it was suspending construction of two light-water nuclear power plants in North Korea in response to the country's development of nuclear weapons. The plants were part of the 1994 Agreed Framework designed to freeze North Korea's nuclear weapons capability. Although the suspension is said to be temporary, for one year from 1 December 2003, the US has indicated that it is unlikely to favour lifting it.

Source 'North Korea ready for nuclear talks next year', Global Security Newswire, 29 December 2003, www.nti.org; 'Annan hails news that DPR of Korea, China agree to fresh round of 6-nation talks', UN News Service, 30 October 2003, www.un.org/news; 'US officials cautious, hopeful after North Korea agrees to talk', Global Security Newswire, 31 October 2003, www.nti.org; 'North Korea reportedly displays "nuclear deterrent force"', Global Security Newswire, 12 January 2004, www.nti.org; 'North Korea threatens seizure of nuclear construction equipment, materials', Global Security Newswire, 12 November 2003, www.nti.org.

Iran signs protocol; Brazil resists; Libya next?

Iran signed an Additional Protocol to its IAEA safeguards agreement on 18 December 2003, following its revelations of an 18-year clandestine nuclear programme. The protocol will allow the IAEA to conduct more intrusive inspections, including short-notice and challenge inspections, and permit greater access to data on Iran's nuclear activities. Although the Iranian parliament and the Guardian Council have to approve the protocol before it enters into force, Iran has assured the IAEA that it will abide by the agreement even before it goes through the domestic ratification process.

The IAEA has also urged Brazil to sign an Additional Protocol in view of its plans to enrich its own uranium by mid-2004. But Brazil has declared that it does not intend to allow the more intrusive monitoring that would be provided for in a Protocol. It claims that, as a peaceful nation, it should not be subject to the same levels of intrusiveness as demanded of countries like Iran and Libya. This is nonsensical given that all

states are expected to accept Additional Protocols regardless of their standing or the level of sophistication of their nuclear programmes. Meanwhile, Libya is expected to sign an Additional Protocol as part of its decision to forego weapons of mass destruction. The addition of Iran, Libya (and presumably Iraq when it resumes full sovereignty) to the roster of states with Additional Protocols is a major boost to the decades-long effort to strengthen nuclear safeguards.

Source 'Iran signs up to nuclear checks', BBC News, 18 December 2003, www.bbc.co.uk; 'Iran signs Additional Protocol', Global Security Newswire, 19 December 2003, www.nti.org; 'IAEA urges Brazil to sign Additional Protocol', Global Security Newswire, 31 December 2003, www.nti.org. For further information on the Additional Protocol see Kenneth Boutin, '93+10: strengthened nuclear safeguards a decade on', VERTIC *Brief* no. 2, February 2004.

Mixed CW developments

In August 2003, after years of legal wrangling, the US army began to destroy chemical weapons at the Anniston Chemical Agent Destruction Facility in Anniston, Alabama. Since construction began six years ago on the US$1 billion incineration facility, an alliance of local and national environmental groups has fought to block its use. Partly because of the delay in opening Anniston and other destruction plants, the US has sought to extend the April 2004 deadline for destroying 45 percent of its CW stockpiles, as required under the CWC, to 2007. Russia is experiencing even greater difficulties. Its destruction facility at Shchuchye in the Ural Mountains will not be completed until mid-2005 and the mostly nerve gas shells stored there will not be fully neutralised before 2012—the deadline for the destruction of Russia's entire CW arsenal, which is considerably larger.

Meanwhile, Libya's admission that it has a substantial chemical weapons arsenal has led it to accede to the CWC, on 6 January 2004. Libya will become the 159th state party to the treaty when the treaty enters into force for it on 5 February 2004. The OPCW has said that it cannot begin inspections until 60 days after that. American and British inspectors have already been shown tens of tonnes of mustard gas produced at least a decade ago at a pharmaceutical plant south of Tripoli. The Libyans also reportedly have hundreds of 250-pound aerial dispersal bombs that could be filled with mustard gas at short notice. Libya will be the sixth party to the CWC to have declared a CW arsenal, the others being the US, Russia, India, South Korea and Albania.

Source Jeffrey Gettleman, 'Army begins burning of chemical weapons in Alabama town', *The New York Times,* 10 August 2003, www.nytimes.com; 'United States will miss chemical weapon destruction deadline; seek extension', Global Security Newswire, 4 September 2003, www.nti.org; Steve Gutterman, 'Sen: Russia too evasive over bioweapons', Yahoo! News, 15 August 2003, http://story.news.yahoo.com; Richard Beeston, 'UN nuclear teams will be sent to Libya within days', *The Times,* 22 December 2003, p. 10.

Compliance troubles for CITES

A report published by TRAFFIC, the joint wildlife trade monitoring programme of the World Wide Fund for Nature (WWF) and The World Conservation Union (IUCN), claims that the domestic ivory trade in Côte d'Ivoire, Nigeria and Senegal is subverting international trade controls established by the 1973 Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES). All three states are in breach of ivory market controls required by CITES. The report says that the lack of effective regulation of the domestic market in these countries, due to inadequate legislation and poor law enforcement, is a significant driver of elephant poaching in other African countries. A large proportion of the ivory on sale in these countries comes from Cameroon, the Central African Republic, the Democratic Republic of the Congo and Gabon. Buyers were identified as being tourists, expatriates and business people from France, Italy, the US and East Asia. The report calls for improved legislation and enforcement, since national market controls are essential to controlling the ivory trade.

Source Marianne Courouble, Francis Hurst and Tom Milliken, 'More ivory than elephants: domestic ivory markets in three West African countries', TRAFFIC Online Report Series No. 8, December 2003, www.traffic.org; 'Ivory trade out of control in three West African countries', World Wildlife Fund Newsroom, 15 December 2003, www.worldwildlife.org; 'West Africa's ivory trade thrives', BBC News, 15 December 2003, www.bbc.co.uk.

Mixed news for Montreal Protocol

There has been mixed news for the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer. Good news comes from US researchers who have concluded that the rate of destruction of the ozone layer has decreased substantially. After analysing 20 years of data from three satellites and three ground-based instruments, scientists claim that they have conclusive proof that the ozone layer is regaining its health. Professor Michael Newchurch of the University of Alabama, who led the research, said that although the ozone layer had been declining by about eight percent per decade for some 20 years, this had now dropped to approximately four percent per decade. The scientists, who believe that the Montreal Protocol is responsible for the improvement, expect the decline to stop altogether in the next few years, although the ozone layer will not make a full recovery for at least 50 years. In the upper stratosphere, where ozone destruction is primarily caused by chlorine pollution, the ozone is already on its way to recovery. The lower stratosphere, meanwhile, is not attaining the same level of recuperation, since other factors, such as greenhouse gases, are having an adverse effect on it.

Unfortunately, a growing black market in chlorofluorocarbons (CFCs) is threatening the success of the protocol. The UK-based NGO, the Environmental Investigation Agency (EIA), released a report at the fifteenth Meeting of the Parties (MOP) to the Montreal Protocol in Nairobi, Kenya, from 10 to 14 November 2003, which revealed a global trade in ozone depleting substances (ODS). The report claimed that smuggling operations were taking place in Singapore, South Africa and the US. Weak enforcement of regulations and the underhand methods of smugglers were cited as driving factors behind this trade. Consequently, the EIA has called on the Montreal Protocol's states parties to shore up ODS controls and improve enforcement through the provision of training and resources. The EIA, however, warned that as long as CFCs were being produced the black market would continue to exist. As a result, it proposed accelerated phase-out of ODS.

The protocol has received another blow, as parties are locked in a dispute over whether to grant the US an exemption under the protocol to use methyl bromide—an ODS. Under the treaty, developed countries are to phase-out methyl bromide consumption by the end of 2004. The US administration, under pressure from the farming and business sectors, is not only asking for an exemption from the phase-out, but also for agreement to increase production. The Dominican Republic, the EU, Guatemala, Japan and Norway are critical of the request. Governments were unable to reach agreement on the issue at the fifteenth MOP; it will be discussed again at an extraordinary meeting in Montreal, Canada, in March 2004.

Source 'Ozone benefits from treaty', BBC News, 1 August 2003, www.bbc.co.uk; American Geophysical Union News, 29 July 2003, www.agu.org; United Nations Environment Programme (UNEP) Ozone Secretariat website, www.unep.org/ozone, 23 September 2003; Ezra Clarke, 'Lost in transit—global CFC smuggling trends and the need for faster phase out', EIA, 10 November 2003, www.eia-international.org; 'Psst, got any CFCs?' *New Scientist*, vol. 2421, 15 November 2003, p. 4; 'Global smuggling of CFCs is growing, UK group says', UN Wire, 11 November 2003, www.unwire.org; 'The Montreal Protocol on Substances that Deplete the Ozone Layer', Montreal Protocol website, 6 January 2004, www.unep.org/ozone/montreal; 'CFC smuggling scam exposed', EIA Press Release, 10 November 2003, www.eia-international.org; 'Illicit trade on the increase—Agency', *Reuters/Planet Ark,* 11 November 2003, www.planetark.com; 'Governments postpone decision on methyl bromide exemption', UN Wire, 14 November 2003, www.unwire.org; 'European delegates oppose US ozone treaty exemption', UN Wire, 12 November 2003, www.unwire.org; 'Bush administration seeks exemption for pesticide banned in treaty', UN Wire, 30 January 2003, www.unwire.org.

Five more countries ratify CTBT

Afghanistan, Eritrea, Honduras, Kyrgyzstan and Libya have all ratified the Comprehensive Nuclear Test Ban Treaty (CTBT). The ratifications bring the total number of treaty parties to 109. There are also 61 signatories. Libya, which deposited its instrument of ratification on 6 January 2004, is by far the most important new state to ratify in over a year, since of has now admitted that it had begun efforts to acquire nuclear weapons.

Meanwhile, the first Executive Secretary of the Preparatory Commission for the CTBTO, Wolfgang Hoffmann, has announced that he is to step down from his post after his contract ends on 31 July 2005.

Source 'Afghanistan signs and ratifies the Comprehensive Nuclear-Test-Ban Treaty on the seventh anniversary of the treaty's opening for signature', CTBTO Press Release, 25 September 2003; 'Kyrgyzstan ratifies Comprehensive Nuclear-Test-Ban Treaty', CTBTO Press Release, 13 October 2003; 'Honduras ratifies Comprehensive Nuclear-Test-Ban Treaty', CTBTO Press Release, 4 November 2003; 'Eritrea signs and ratifies the Comprehensive Nuclear-Test-Ban Treaty', CTBTO Press Release, 12 November 2003; 'Libya ratifies Comprehensive Nuclear-Test-Ban Treaty', CTBTO Press Release, 13 January 2004; 'Top test ban treaty official to step down in 2005', Global Security Newswire, 20 November 2003, www.nti.org.

Milan sees steadfast progress in climate talks

The Ninth Conference of the Parties (COP9) to the 1992 United Nations Framework Convention on Climate Change (UNFCCC), attended by VERTIC, took place on 1–12 December 2003 in Milan, Italy. The atmosphere at the conference was both hopeful and purposeful, despite concerns over Russia's continuing oscillation over whether or not to ratify the 1997 Kyoto Protocol. Consequently, progress was made in a number of areas. Further, there were a large number of side events, with a broad range of contributors demonstrating their interest in, and commitment to, resolving the climate change problem.

A variety of issues were on the agenda, ranging from the straightforward to the contentious. Perhaps the most notable issue concerned rules for carbon sinks in the Clean Development Mechanism (CDM). Under the Kyoto Protocol the CDM allows developed parties to carry out projects that reduce emissions in developing countries. There was a plethora of divergent views among parties and non-governmental organisations (NGOs) on this technical subject. After intense negotiations, however, a compromise decision was reached, specifying how sinks can be used. Surprisingly, the *Guide to Good Practice Guidance for Land Use, Land Use Change and Forestry* by the Intergovernmental Panel on Climate Change (IPCC) also caused a stir, resulting in only part of the document being adopted at this session. Grievances did not concern the content of the guide, but, rather, the lack of time given to parties to review it before making a decision on its adoption.

Annex I parties (developed countries) discussed issues relating to their national communications and proposed a workshop to improve the timeliness of submissions and to increase transparency in reporting. There were also proposals for workshops on emissions projections and national systems under the Kyoto Protocol. Agenda items relating to the national communications of Non-Annex I parties (developing countries) generated lively debate on how often these parties should report (without any definite result) and on how to improve their capacity to report. A decision was taken to initiate a review of general capacity-building in developing countries and countries with economies in transition. In addition the conference requested the Global Climate Observing System (GCOS) Secretariat to coordinate the development of a phased five-to-10 year implementation plan for the integrated global observing systems for climate. COP9 saw considerable progress in regard to the review system for greenhouse gas (GHG) inventories. A training programme for expert review teams (ERTs), which are responsible for assessing the GHG inventories of Annex I countries, is now underway. In addition, side events were held concerning challenges for ERTs and on the development of new software to facilitate GHG inventory reporting.

COP9 witnessed progress in negotiations on both the UNFCCC and the Kyoto Protocol. The vast amount of work now being conducted globally on so many different aspects of climate change was evident during the side events. Many parties voiced a strong commitment to take action on climate change and many parties stated that much more needs to be done. The next COP is to be held in Buenos Aires, Argentina, between 29 November and 10 December 2004.

Larry MacFaul
Environment Researcher, VERTIC

Science & Technology Scan

Airships for verification?

The US military is considering using airships, equipped with the latest sensor technology, to play a surveillance role in homeland security, as well as for military intelligence and civilian purposes. Although airships have been out of favour in recent years, they offer a number of advantages over rotary and fixed-wing surveillance aircraft. They can loiter above a target for 24 hours a day and can remain operational for weeks at a time, offering persistent coverage. They can operate at up to 10,000 feet (approximately 3,000 metres) and so can remain unseen at high altitudes, from where their sensors can observe wide areas. As they use less fuel than aircraft or helicopters they are cheaper to operate. They are also cheaper and more flexible than unmanned aerial vehicles (UAVs) or satellites. Airships also produce little noise or vibration—ideal for sensors—as well as little air pollution. Using an array of hi-tech surveillance equipment, including infrared for night operations, the verification uses of airships might include the long-term monitoring of weapons facilities, demilitarised zones or borders.

Source Steve Vogel, 'Military has high hopes for new eye in the sky', *The Washington Post,* 8 August 2003, www.washingtonpost.com; Tony Perry, 'The next weapon in the US war on terrorism might be surveillance blimps', *Los Angeles Times,* 13 September 2003, www.latimes.com.

Environmental monitoring advances

Large-scale observation systems are burgeoning on both sides of the Atlantic. The US National Climatic Data Center has developed a new system—the 'Climate Reference Network'—to monitor climate change in the US. The system comprises multiple stations that record solar radiation, rainfall, wind and temperature and are located far away from urban areas to avoid problems associated with pollution and heat. In Europe, significant steps have been taken towards unifying the region's many Earth-observation capabilities into a comprehensive network. A joint European Commission/European Space Agency (EC/ESA) steering committee moved the initiative forward at a user forum in Baveno, Italy, in November 2003. It proposed that a Global Monitoring for Environment and Security (GMES) network be set up by 2008. GMES is designed to supply data for a plethora of Earth observation applications, including those related to the environment, land-use planning, civil defence and security. GMES will also serve as Europe's contribution to the Global Observing System (GOS).

Source 'New US system to start monitoring climate change', UN Wire, 16 December 2003, www.unwire.org; 'Inching forward', *Aviation Week & Space Technology,* vol. 159, no. 23, 8 December 2003, p. 38; Global Monitoring for Environment and Security (GMES) website, www.gmes.info, 8 January 2003.

US keeps secrets under wraps

The US administration has issued an order delaying by three years the release of millions of government documents and giving it the power to reclassify information. This overturns an executive order signed by President Bill Clinton in 1995 to declassify millions of national security documents more than 25 years old unless they fell into a narrow category of sensitive information that continued to require protection. Previously, documents remained unclassified indefinitely. The latest order includes new powers to exempt various documents from future declassification, such as 'information that would assist in the development or use of weapons of mass destruction'. It reflects a growing trend, particularly since the 11 September 2001 terrorist attacks in the US, towards increasing government secrecy and establishing limits on freedom of information. Whether these new powers will hinder civil society in monitoring compliance with arms control and other agreements and in encouraging transparency in security matters generally remains to be seen.

Source 'US ready to rescind Clinton order on government secrets', *The New York Times,* 20 March 2003, www.nytimes.com; 'Release of documents is delayed. Classified papers to be reviewed', *The Washington Post,* 26 March 2003, p. A15.

VERTIC | News & Events

Verification Yearbook 2003 launch

Some 30 people attended the launch of the *Verification Yearbook 2003* at the Guardian and Observer Visitor Centre in London on 18 December. They included representatives of academia, the media, and other non-governmental organisations, as well as VERTIC board members and *Yearbook* contributors.

Board changes

VERTIC is pleased to announce that Duncan Brack joined its Board of Directors in late January. Formerly head of the Sustainable Development Programme at the Royal Institute of International Affairs (RIIA) in London, he is now an Associate Fellow there. Dr Brack is the author of the chapter on 'Verifying the Montreal Protocol' in the *Verification Yearbook 2003*.

Staff changes

VERTIC regrets to announce that its Arms Control and Disarmament Researcher, Ben Mines, is leaving in mid-January to take up a position in the UK Civil Service. Ben joined VERTIC in February 2003 as an intern, working primarily on the Iraqi weapons inspection dataset. In July he was appointed Arms Control and Disarmament Researcher. He co-authored 'UNMOVIC in Iraq: opportunity lost' with Trevor Findlay, which appeared in the *Verification Yearbook 2003,* and has written a VERTIC *Brief* on CTBT verification, which is to be published in February 2004. We wish him well in his new position.

New intern

Kavita Rajagopalan, from India, joined VERTIC in January for a three-month internship. A third-year student at the University of North Carolina, Chapel Hill, in the US, Kavita is majoring in international studies, with a minor in German. At VERTIC she is researching India/Pakistan monitoring mechanisms.

Annual reports

VERTIC's 2001 and 2002 Annual Reports are now available. Please e-mail Jane Awford at jane.awford@vertic.org to get a free copy.

Postgraduate careers briefing

On 13 January VERTIC hosted a visit by postgraduate students and staff from: the Fletcher School at Tufts University in Boston, US; the Fondation Nationale des Sciences Politiques (Sciences Po) in Paris, France; and the Hubert H. Humphrey Institute of Public Affairs at the University of Minnesota, US. VERTIC staff members briefed the students about their respective areas of research and talked about their own academic and professional careers, as well as the pros and cons of working for NGOs.

Staff news

TREVOR FINDLAY gave a presentation on 4 December on the control of biological weapons at the National Press Club in Washington, DC, at an all-day seminar on WMD issues, organised by the Ploughshares Fund, for journalists. While in Washington he met with Pat Nicholas of the Carnegie Corporation of New York. On 16 December he met with Aaron Markovitz-Shulman, who is researching the possibilities of NGO monitoring of Palestinian compliance with a future Middle East peace accord, to discuss VERTIC's Middle East project. On 19 December he met with David Mason, Counsellor at the Australian Mission in Vienna, Austria, to discuss nuclear nonproliferation issues. Along with Ben Handley, Trevor attended a meeting on 8 January of prospective NGO tenants of a new Ethical Properties building in London. He had a lunch meeting with Ian Davis, Executive Director of the British American Security Information Council (BASIC) and Paul Eavis of Saferworld on 9 January. His media work during the period included: an interview on 22 December with Radio France Europe on how to verify Libya's offer to renounce weapons of mass destruction; a briefing to BBC Online with regard to the likely IAEA inspection process in Libya; and an interview with Austrian Radio on 8 January on gaps in the nuclear nonproliferation system.

JANE AWFORD represented VERTIC at the Parliamentary Skills workshop organised by BASIC at the Grayston Centre on 2 December. Mareike Junge of Peaceworkers UK and Alice Hutchinson of Saferworld shared their experiences of working with parliament. On 3 December she attended the Online Information exhibition at Olympia. Jane and Ben Handley coordinated arrangements for the launch of the *Verification Yearbook 2003* at the VERTIC Christmas party on 18 December. She participated in the Harvard–Sussex Program Day on 'Global Civil Society and Biological and Chemical Weapons' on 12 January at the University of Sussex and the Quaker Peace and Social Witness

Conference on the '1-year Peaceworker (Britain) Programme' on 14 January. She is also overseeing advertising and distribution of the *Verification Yearbook 2003*.

BEN HANDLEY continues to manage VERTIC's administration. In early December he worked closely with the auditors to produce VERTIC's accounts for the 2002–2003 financial year. On 9 December he attended a seminar on 'Legal Exposure in Employees' E-Messaging and Internet Usage'. Ben also prepared financial reports for VERTIC's funders and a financial report for the VERTIC Board's Annual General Meeting in January 2004.

LARRY MACFAUL represented VERTIC at COP9 in Milan from 1–12 December 2003. While there he contributed to the Climate Action Network (CAN) conference publication, *ECO*. Along with Jane Awford, Larry also attended the 'Communicating Biodiversity' meeting organised by the Royal Society for the Protection of Birds (RSPB) and the RIIA at Chatham House on 16 December.

BEN MINES, along with Trevor Findlay, attended a presentation at Chatham House on 12 December 2003 by Sir Jeremy Greenstock, the UK Special Representative to Iraq, entitled 'Iraq: a half-term report'. He also prepared a VERTIC *Brief* on CTBT verification, which is to be published in February/March 2004. Ben is co-editor of this issue of *Trust & Verify*.

ANGELA WOODWARD began planning a workshop to be held in mid-2004 to examine the critical issues facing on-site inspection as a tool for verifying compliance with the BWC. On 11 December Angela, Trevor Findlay and Ben Mines met with Michael Vannoni and Kent Biringer of the Cooperative Monitoring Center (CMC) of the Sandia National Laboratory, Albuquerque, New Mexico, to discuss possible cooperation between VERTIC and the CMC. Angela represented VERTIC at the Landmine Action Annual General Meeting in London on 11 December. She received her LLM (with Merit) in Public International Law from the London School of Economics and Political Science, University of London, on 17 December.

building trust through verification

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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