

14. Libya's renunciation of nuclear, biological and chemical weapons and ballistic missiles

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I. Introduction

In a joint statement with the United Kingdom and the United States on 19 December 2003, Libya publicly renounced nuclear, biological and chemical (NBC) weapons and agreed to restrict itself to the possession of ballistic missiles with a range of no more than 300 kilometres. It agreed to adhere to the 1968 Treaty on the Non-Proliferation of Nuclear Weapons (Non-Proliferation Treaty, NPT), the 1972 Biological and Toxin Weapons Convention (BTWC), the 1993 Chemical Weapons Convention (CWC) and the guidelines of the Missile Technology Control Regime (MTCR).¹ Libya also agreed to allow international inspectors to verify its commitments, including the dismantlement of its nuclear weapon programme and the destruction of its chemical weapon (CW) stockpile. In 2004 the remaining sanctions against Libya were lifted and the country took further steps to implement its commitments and to reintegrate itself into the international community.²

As information became available on Libya's former programmes, details of an informal nuclear weapon suppliers' network (the so-called Khan network, which sold technology to Libya until 2003³) emerged and a new basis was provided for evaluating the proliferation assessments that governments had made in the past. The British and US role in prompting Libya's action intensified debate over the merit of different approaches—national and institutional, foreign and domestic—to addressing concerns about NBC weapons.

Section II provides background to Libya's decision to renounce NBC weapons and its most capable ballistic missiles. Section III describes the trilateral process of negotiation between Libya, the UK and the USA and the subsequent lifting of remaining sanctions. International reaction to Libya's

¹ Libya acceded to the 1925 Geneva Protocol on 29 Dec. 1971 with the reservation that this did not imply recognition of Israel and that Libya would not be bound by Geneva Protocol provisions if other states or their allies did not adhere to those prohibitions. Libya acceded to the CWC on 6 Jan. 2004 and to the BTWC on 19 Jan. 1982. In 1999 Libya began to participate in negotiations on a protocol to strengthen the BTWC. (The negotiations were suspended indefinitely in 2001.) Libya deposited its instrument of ratification to the 1996 Comprehensive Nuclear Test-Ban Treaty on 6 Jan. 2004. On the BTWC and CWC see chapter 13 in this volume. On MTCR see chapter 17 in this volume.

² E.g., Williams, F., 'Libya to start talks to end world trading isolation', *Financial Times*, 28 July 2004, p. 6.

³ On the Khan network see section V and chapter 12 in this volume.

decision is discussed in Section IV. Libya's weapon programmes are described in sections V–VII. The conclusions are presented in section VIII.

II. Background

Until 2004 Libya was subjected to one of the most stringent of all United Nations (UN) sanctions regimes,⁴ not for reasons connected with weapon programmes but in consequence of its involvement in a number of violent incidents during the 1980s, for which it subsequently admitted at least partial responsibility.⁵ The country was implicated *inter alia* in the 21 December 1988 bombing of the Pan Am airliner which exploded over Lockerbie, Scotland, and the 19 September 1989 bombing of the UTA French airliner which crashed over Niger. In 1992 the UN Security Council passed Resolution 731, which strongly deplored the fact that Libya had not 'responded effectively' to the requests of other governments for help in their criminal investigations and called on it to 'cooperate fully in establishing responsibility for the terrorist acts' against the two aircraft. The resolution requested the UN Secretary-General to 'seek the cooperation' of Libya to provide 'a full and effective response' to the requests.⁶ In 1992 the Security Council passed Resolution 748, which imposed an arms and air travel embargo on Libya for failing to comply with Resolution 731.⁷ In April 1999 the Security Council suspended its sanctions against Libya after it turned over to a Scottish court two suspects wanted in connection with the Lockerbie bombing. In August 2003 Libya accepted responsibility for the bombing and agreed to pay \$2.7 billion in compensation. In 2003 the UN Security Council approved Resolution 1506, which lifted the sanctions imposed in 1992.⁸

III. The trilateral process and the lifting of sanctions

Throughout the 1990s, Libya is reported to have signalled interest in normalizing its relations with Europe and the USA.⁹ According to a member of the

⁴ For background see Katzman, K., *U.S.–Libyan Relations: An Analytical Compendium of U.S. Policies, Laws & Regulations* (Atlantic Council: Washington, DC, Aug. 2003).

⁵ Libya was implicated in supporting the Abu Nidal organization when the group attacked the Rome and Vienna airports on 27 Dec. 1985. Libya was also implicated in the bombing of the La Belle nightclub in Berlin on 5 Apr. 1986. On 13 Nov. 2001 a German court found 4 people guilty of the bombing, including a former employee of the Libyan Embassy to East Germany. US Department of State, 'Background note: Libya', Fact Sheet, Oct. 2004, URL <<http://www.state.gov/r/pa/ei/bgn/5425.htm>>. On 17 April 1984 Yvonne Fletcher, a British policewoman, was killed outside Libya's embassy in London during a confrontation between pro- and anti-Qadhafi demonstrators. The shooting suspect was afforded diplomatic immunity by Libya and was therefore permitted to leave the UK.

⁶ UN Security Council Resolution 731, 21 Jan. 1992.

⁷ UN Security Council Resolution 748, 31 Mar. 1992. On 11 Nov. 1993 the Security Council passed Resolution 883 which strengthened UN sanctions against Libya under Chapter VII of the UN Charter, under which military intervention to maintain or restore international peace and security may be invoked.

⁸ UN Security Council Resolution 1506, 12 Sep. 2003.

⁹ Dunne, M., *Libya: Security is Not Enough*, Policy Brief no. 32 (Carnegie Endowment for International Peace: Washington, DC, Oct. 2004), p. 2.

US National Security Council (NSC), starting in 2002, Libya sent to the USA numerous 'direct and indirect messages' indicating its 'eagerness to resolve differences'.¹⁰ During these contacts, the USA indicated that, in addition to the Lockerbie bombing, two main issues needed to be addressed: (a) the verifiable renunciation of Libya's NBC weapon and medium- and long-range missile programmes, and (b) an end to Libya's support of terrorism.¹¹

In March 2003, while negotiations were being held on the Lockerbie settlement, the head of the Libyan intelligence service reportedly approached officials from the British Secret Intelligence Service (SIS, commonly known as MI6) and expressed Libya's willingness to renounce NBC weapons.¹² Officials from the US Central Intelligence Agency (CIA) were later invited to participate in the discussions. Libya, the UK and the USA then engaged in secret negotiations that resulted in two visits, in October and December 2003, to Libya by CIA and MI6 officials, who interviewed Libyan scientists and were said to be struck by their openness.¹³ According to Libya's official news agency, the British and US officials were given information on 'materials, equipment and programmes [for NBC weapons] which led to the manufacture of internationally banned weapons with centrifuges and containers for the transfer of chemical materials'.¹⁴ In addition, Libya reportedly provided the CIA and MI6 with 'exceptional' information on 'hundreds' of Islamic extremists, including those affiliated with al-Qaeda.¹⁵

A joint public statement issued on 19 December 2003¹⁶ was drafted at a meeting between British and Libyan officials in London on 16 December 2003 and subsequently agreed by Libya, the UK and the USA. Final approval of the document was facilitated by a telephone conversation between British Prime Minister Tony Blair and Libyan President Muammar Qadhafi.¹⁷ In its national press release of 20 December, Libya indicated that it was also committed to working for a Middle East and Africa that are 'free from weapons of mass destruction' (WMD).¹⁸

¹⁰ Dunne (note 9), footnote 3. Michele Dunne was the NSC member in question.

¹¹ Dunne (note 9), p. 2.

¹² Fidler, S., Khalaf, R. and Huband, M., 'Return to the fold: how Gaddafi was persuaded to give up his nuclear goals', *Financial Times*, 27 Nov. 2004, p. 11.

¹³ Tyler, P. E. and Risen, J., 'Libya arms talks lasted months', *International Herald Tribune*, 22 Dec. 2003, pp. 1, 6.

¹⁴ 'Foreign Liaison Secretary—Statement', Jana, 20 Dec. 2003, URL <<http://www.jamahiriyanews.com/>>.

¹⁵ Beaumont, P., Bright, M. and Ahmed, K., 'Libya's spies' secret deal to reveal terrorists', *The Observer* (Internet edn), 21 Dec. 2003, URL <<http://observer.guardian.co.uk/international/story/0,6903,1111197,00.html>>.

¹⁶ 'Foreign Liaison Secretary—Statement' (note 14).

¹⁷ Beaumont, P., Ahmed, K. and Bright, M., 'The meeting that brought Libya in from the cold', *The Observer* (Internet edn), 21 Dec. 2003, URL <<http://observer.guardian.co.uk/international/story/0,6903,1111161,00.html>>.

¹⁸ 'Foreign Liaison Secretary—Statement' (note 14). In Sep. 2004 Libya, the UK and the USA agreed an 'arrangement to discuss any future WMD concerns'. Dunne (note 9), p. 4.

International reaction

International reaction to Libya's commitment was positive. The Organisation for the Prohibition of Chemical Weapons (OPCW), the body which monitors compliance with the CWC, welcomed the Libyan Foreign Minister's announcement that his country would adhere to the convention 'without delay'.¹⁹ The UN Security Council welcomed Libya's decision to abandon its WMD programmes and the means to deliver such weapons. It also reaffirmed 'the need to seek to resolve proliferation problems by peaceful means through political and diplomatic channels'.²⁰ On 26 June 2004 the US–European Union (EU) Declaration on the Non-proliferation of Weapons of Mass Destruction welcomed 'Libya's decision to abandon, under international verification, its WMD and longer-range missile programs'.²¹ The US Administration also welcomed Libya's decision, citing it as a 'powerful precedent that a state can surrender WMD without a regime change'.²²

Egypt and Syria expressed their support for Libya's decision. However, some government officials in the Middle East reportedly expressed the view that Libya should not have taken what they perceived as a unilateral step without first having secured agreement on verifiably transforming the Middle East into a WMD-free zone and that such a step should only have been taken once Israel had agreed to become a party to the NPT.²³

The lifting of sanctions

In February 2004 the USA lifted restrictions on travel to Libya and, in April 2004, it ended the applicability of the 1996 Iran–Libya Sanctions Act.²⁴ The USA re-established direct diplomatic relations with Libya on 28 June 2004.²⁵ On 20 September US President George W. Bush issued an executive order

¹⁹ Organisation for the Prohibition of Chemical Weapons (OPCW), 'Libya to adhere to the Chemical Weapons Convention', Press Release no. 40, 22 Dec. 2003, URL <http://www.opcw.org/html/global/press_releases/2k3/PR40_2003.prt.html>.

²⁰ United Nations News Service, 'Security Council welcomes Libya's decision to abandon weapons of mass destruction programmes', Press Release SC/8069, New York, 22 Apr. 2004, URL <<http://www.un.org/News/Press/docs/2004/sc8069.doc.htm>>.

²¹ The White House, 'Fact sheet: U.S.–EU summit: declaration on the nonproliferation of weapons of mass destruction', 26 June 2004, URL <<http://www.whitehouse.gov/news/releases/2004/06/20040626-11.html>>.

²² Bolton, J., 'The Bush Administration's forward strategy for nonproliferation', Presentation to the American Enterprise Institute, Washington, DC, 24 June 2004, URL <<http://www.state.gov/t/us/rm/33907.htm>>; and Mahley, D., 'Dismantling Libyan weapons: lessons learned', *The Arena* (Chemical & Biological Arms Control Institute: Washington, DC, Nov. 2004), available at URL <<http://www.cbaci.org>>.

²³ Middle East Media Research Institute (MEMRI), 'Arab media reactions to Libya's announcement of WMD dismantlement', Special Dispatch no. 640, 13 Jan. 2004.

²⁴ 'Travel warning', US Department of State advisory, 29 Dec. 2004, URL <http://travel.state.gov/travel/cis_pa_tw/tw/tw_926.html>; and US Department of Energy, Energy Information Administration, 'Global energy sanctions', URL <<http://www.eia.doe.gov/emeu/cabs/sanction.html>>.

²⁵ 'US resumes relations with Libya', BBC News Online, 28 June 2004, URL <<http://news.bbc.co.uk/1/hi/world/africa/3848499.stm>>.

lifting trade sanctions against Libya that had been in place since 1986.²⁶ In October 2004 the EU lifted its trade embargo and other sanctions against Libya and removed most of its restrictions on arms sales to the country.²⁷ UN sanctions were lifted on 12 September 2003.²⁸

The rationale for Libya's decision

A number of possible factors have been cited to explain Libya's decision to renounce NBC weapons and medium- and long-range missiles. US Administration officials have portrayed the decision as a vindication of the administration's robust approach to combating the spread of NBC weapons.²⁹ They noted that Qadhafi had initiated the discussions a few days before the US-led war on Iraq began in March 2003. They also suggested that a US-initiated coalition operation that intercepted, in October 2003, a German-owned freighter carrying a secret shipment of centrifuge parts to Tripoli was an important factor in convincing Libya of the futility of pursuing its NBC weapon programmes.³⁰

However, there has been disagreement over whether—or to what extent—the Bush Administration's counter-proliferation strategy should be credited for Libya's decision. Some observers have described it as part of the Qadhafi regime's long-term diplomatic efforts to overcome two decades of political and economic isolation.³¹ The stringent international sanctions regime imposed on Libya had caused serious damage to its economy. According to Libya's prime minister, the government concluded that its NBC weapon and missile programmes were consuming scarce resources but would have only limited military and political utility.³² Other Libyan officials reportedly expressed irritation over the US Administration's efforts to portray the Libyan decision as a vindication of its policies.³³

²⁶ 'Executive Order 13357 of September 20, 2004', *Federal Register*, 22 Sep. 2004, pp. 56665–66, URL <http://www.access.gpo.gov/su_docs/aces/fr-cont.html>.

²⁷ Council of the European Union, 'Press release, 2609th Council meeting', EU Press Release, 11 Oct. 2004, p. 8, para. 7, available at URL <<http://www.europa.eu.int>>.

²⁸ United Nations, 'Security Council lifts sanctions against Libya imposed after Lockerbie bombing', UN Press Release, 12 Sep. 2003, URL <<http://www.un.org/av/photo/sc/sc091203.htm>>.

²⁹ The White House, Office of the Press Secretary, 'The President's national security strategy to combat WMD: Libya's announcement', Fact Sheet, 19 Dec. 2003, URL <<http://www.whitehouse.gov/news/releases/2003/12/20031219-8.html>>.

³⁰ Wright, R., 'Ship incident may have swayed Libya', *Washington Post* (Internet edn), 1 Jan. 2004, URL <<http://www.washingtonpost.com/ac2/wp-dyn/A46260-2003Dec31>>. The operation marked the first interception of a vessel under the US-organized Proliferation Security Initiative (PSI). On the PSI see chapter 18 in this volume.

³¹ Williams, D., 'Possible opening to West stirs hope in Libya', *Washington Post* (Internet edn), 27 Dec. 2003, URL <<http://www.washingtonpost.com/wp-dyn/articles/A33259-2003Dec26.html>>; and Indyk, M., 'The Iraq War did not force Gaddafi's hand', *Financial Times*, 9 Mar. 2004, URL <<http://www.brookings.edu/views/op-ed/indyk/20040309.htm>>.

³² Shukri Ghanem, quoted by Fidler, Khalaf and Huband (note 12).

³³ Referring to the US Government's display to the media of some sensitive nuclear equipment and material it had removed from Libya, an official from the International Atomic Energy Agency reported that Libya was 'quite unhappy with this dog and pony show because it hurts them domestically [and] in the Arab world'. 'Libya upset over US calling disarmament a "victory" for Washington', Channel News Asia, 17 Mar. 2004, distributed via the BioWeapons Prevention Project discussion forum, 19 Mar. 2004.

There has been speculation that Libya may have been motivated by additional considerations. It has been suggested that Qadhafi wished to improve his relations with the West at least in part because he believed that al-Qaeda-affiliated militants were planning to assassinate him.³⁴ This view is supported by the fact that, in October 1993, Libyan security forces arrested suspected coup plotters, including some members of Libya's military, who were said to have held extreme Islamic views.³⁵

In a November 2004 interview Qadhafi described the decision by Libya in the context of its security concerns and regional geopolitical interests.³⁶ In particular, he noted that Libya's weapon programmes were in line with similar programmes being undertaken elsewhere and that, had Libya succeeded in developing nuclear weapons, it was not clear under what circumstances they might actually have been used. He also stated that Libya's decision was partly the result of 'fear' of such weapons among its neighbouring states. Qadhafi expressed dissatisfaction about the benefits received by his country stating: 'They have not really compensated Libya for its contribution to international peace. If we are not compensated other countries, in turn, are not going to follow our example'. Finally, Qadhafi said that Libya had received neither security guarantees from other countries nor adequate assistance to help transform military programmes for civilian purposes.³⁷

Qadhafi has periodically attempted to change his image and his government's policies, at various times emphasizing Libya's geopolitical role as either a part of a pan-Arab Middle East or more oriented towards sub-Saharan Africa. Libya's decision can therefore be seen as an example of another such shift by Qadhafi.

IV. Assessments of Libya's activities

Intelligence information played an important role in the trilateral negotiations on Libya's past weapon programmes and allowed the UK and the USA to compare notes with Libya and to seek clarification of issues of concern partly through carrying out on-site visits and interviews with facility personnel.

Public information about Libya's biological weapon (BW) and nuclear weapon-related activities did not adequately reflect the true situation, while information on its missile programme and, to a lesser extent, its CW programme was more accurate. Until recently, most authoritative or official information on suspected Libyan NBC weapon and missile programmes was contained in status-of-proliferation reports and statements issued by the USA and other states. Some information was also released as a consequence of criminal proceedings against individuals and companies which had violated

³⁴ For background see US Department of State, 'Appendix C: background information on other terrorist groups', URL <<http://www.state.gov/documents/organizations/31947.pdf>>.

³⁵ US Department of State (note 5).

³⁶ Prier, P., 'Muammar Kadhafi: "Que fait l'armée française en Afrique?"' [Muammar Kadhafi: 'what is the French Army doing in Africa?'], *Le Figaro*, no. 18756 (24 Nov. 2004), p. 2.

³⁷ Prier (note 36).

the sanctions regime. Notably, a number of nuclear and CW-related prosecutions in Germany in the 1980s resulted in a large number of German investigative press reports and government inquiries.³⁸ Most other information came from media reports of varying or doubtful quality.

Most of the information produced by the USA is contained in reports and congressional testimony, including annual status-of-proliferation reports that are produced by the CIA.³⁹ In 1993 Russia's Foreign Intelligence Service (SVR, Sluzhba Vneshnoi Razvedky) issued a report on threats posed by NBC weapons and medium- and long-range missiles that included information on Libya.⁴⁰ The language in US assessments from year to year was often identical or very similar but could contain significant omissions: for instance, a 1998 CIA report to Congress did not discuss whether Libya was pursuing a nuclear or a BW programme.⁴¹ In general, the CIA also emphasized Libya's dependence on other countries for equipment, matériel, technology and expertise. While various intelligence services undoubtedly possessed more detailed information, it is reasonable to assume that classified assessments did not reach opposite conclusions from those that were published.

According to the CIA, during the trilateral process Libya 'made significant disclosures' about its 'nuclear, chemical and missile-related activities' and 'minor disclosures about biological-related activities'.⁴² Libya's weapon laboratories were characterized by some involved in the trilateral process as 'weak, inefficient and demoralized'.⁴³ Its NBC and missile programmes were also alleged to have been mismanaged and underfunded.⁴⁴

V. Libya's nuclear weapon programme

Under Qadhafi's leadership, Libya has been a perennial source of concern as regards the proliferation of nuclear weapons and ballistic missile delivery

³⁸ Wiegele, T. C., *The Clandestine Building of Libya's Chemical Weapons Factory: A Study in International Collusion* (Southern Illinois University Press: Carbondale, Ill., 1992); Lundin, S. J., 'Chemical and biological warfare: developments in 1988', *SIPRI Yearbook 1989: World Armaments and Disarmament* (Oxford University Press: Oxford, 1989), pp. 110–111; and *Händler des Todes: Bundesdeutsche Rüstungs- und Giftgasexporte im Golfkrieg und nach Libyen* [Trade in death: Federal German Republic arms and poison gas exports in the Gulf War and to Libya] (ISP-Verlag: Frankfurt am Main, 1989).

³⁹ See the US Central Intelligence Agency Internet site at URL <<http://www.cia.gov/cia/reports/index.html>>.

⁴⁰ Russian Foreign Intelligence Service (SVR), *Novy Vyzov posle 'Kholodnoi Voimy': Rasprostranenie Oruzhiya Massovogo Unichtozheniya (Otkryty Doklad SVR za 1993g)* [New challenges after the 'cold war': the proliferation of weapons of mass destruction (SVR open report for 1993)] (SVR: Moscow, 1993), URL <<http://svr.gov.ru/material/2-1.html>>.

⁴¹ US Central Intelligence Agency, 'Unclassified report to Congress on the acquisition of technology relating to weapons of mass destruction and advanced conventional munitions, 1 January through 30 June 1998', URL <http://www.cia.gov/cia/reports/721_reports/jan_jun1998.html#libya>.

⁴² US Central Intelligence Agency, 'Attachment A, Unclassified report to Congress on the acquisition of technology relating to weapons of mass destruction and advanced conventional munitions, 1 July through 31 December 2003', URL <http://www.cia.gov/cia/reports/721_reports/july_dec2003.htm>.

⁴³ Slevin, P. and Pincus, W., 'Libya made progress in nuclear goal', *Washington Post*, 21 Dec. 2003, p. A01, URL <<http://www.washingtonpost.com>>.

⁴⁴ Beaumont, Ahmed and Bright (note 17).

systems.⁴⁵ Libya ratified the NPT in 1975 and concluded a full-scope safeguards agreement with the International Atomic Energy Agency (IAEA) in 1980.⁴⁶ Despite these steps, many government analysts and independent experts suspected that the Qadhafi regime was engaged in undeclared nuclear activities as part of a proscribed military programme.⁴⁷ There were persistent suspicions, for example, that some installations being built as part of Libya's ambitious Great Man-Made River Project, a water-diversion scheme for irrigation purposes, were connected with NBC weapon-related activities.⁴⁸ At the same time, it was generally believed that Libya had not been able to make significant progress towards achieving a nuclear weapon capability owing to a lack of indigenous resources and expertise resulting from the imposition of international sanctions.⁴⁹ The 1993 Russian SVR report stated that it had no information that Libya possessed nuclear weapons and that approximately 50 foreign nuclear specialists, none of whom were nuclear weapon experts, were working in Libya on private contracts.⁵⁰

The nuclear infrastructure

Libya has a modest civil nuclear infrastructure, centred on the Tajura Nuclear Research Center (TNRC) near Tripoli. The TNRC is the site of a 10-megawatt (MW) research reactor that was completed with Soviet assistance in 1981 and placed under IAEA safeguards.⁵¹ It encompasses 15 facilities and laboratories, including a critical facility, a neutron generator and a Tokamak fusion reactor. It also is the site of a radiochemical laboratory that supports isotope production activities and a nuclear metallurgy laboratory.⁵²

⁴⁵ For an overview of Libya's nuclear programme see Feldman, Y. and Mahaffey, C., 'Country profile 6: Libya', in the SIPRI series 'Countries of nuclear strategic concern', URL <<http://projects.sipri.se/nuclear/cnscl1ya.htm>>; and Federation of American Scientists, 'Libya special weapons', 27 Sep. 2004, URL <<http://www.fas.org/nuke/guide/libya>>.

⁴⁶ Libya concluded a safeguards agreement with the IAEA. IAEA, 'The text of the Agreement of 8 July 1980 between the Libyan Arab Jamahiriya and the Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons', INFCIRC/282, 13 Oct. 1980, URL <<http://www.iaea.org/Publications/Documents/Infcircs/Countries/libya.shtml>>. States which have safeguards agreements and Additional Protocols in force are listed in annex A to this volume. Libya is also party to the 1996 African Nuclear-Weapon-Free Zone (Treaty of Pelindaba), which established an African nuclear weapon-free zone. For lists of parties and signatory and non-signatory states see annex A in this volume.

⁴⁷ See, e.g., US Department of Defense, *Proliferation: Threat and Response* (Department of Defense: Washington, DC, Jan. 2001), pp. 45–48; and Cirincione, J., Wolfstahl, J. and Rajkumar, M., *Deadly Arsenals: Tracking Weapons of Mass Destruction* (Carnegie Endowment for International Peace: Washington, DC, 2002), pp. 307–12.

⁴⁸ See, e.g., Center for Security Policy, 'Great "Man-Made River" project', Decision Brief no. 03-D49, 22 Dec. 2003, URL <http://www.centerforsecuritypolicy.org/index.jsp?section=papers & code=03-D_49>.

⁴⁹ Albright, D., Berkhout, F. and Walker, W., SIPRI, *Plutonium and Highly Enriched Uranium 1996* (Oxford University Press: Oxford, 1997), p. 351; and US Department of Defense (note 47), p. 45.

⁵⁰ Russian Foreign Intelligence Service (SVR) (note 40).

⁵¹ Feldman and Mahaffey (note 45). The reactor was operated only intermittently by local staff after Soviet technical support was withdrawn in 1991.

⁵² Boureston, J. *et al.*, 'Verifying Libya's nuclear disarmament', *Trust & Verify*, no. 112 (Jan./Feb. 2004), p. 1, URL <<http://www.vertic.org/assets/TV112.pdf>>.

The suspension of UN sanctions in 1999 provided Libya with the opportunity to enhance its nuclear infrastructure through foreign procurement and scientific cooperation. Russia initiated discussions with Libya on resurrecting a controversial Soviet-era proposed deal to construct a nuclear power reactor and offered to assist Libya in modernizing the TNRC.⁵³ The USA sought to block this and other forms of nuclear energy cooperation, arguing that such civil-sector work could help Libya develop the dual-use infrastructure and technical expertise suitable for a military programme.⁵⁴

Libya received considerable foreign assistance in procuring sensitive nuclear materials, technologies and components. Much of this assistance was provided by a sophisticated clandestine network run by Abdul Qadeer Khan, sometimes referred to as the 'father' of Pakistan's nuclear weapon programme.⁵⁵ Beginning in 1997, the Khan network supplied Libya with centrifuges and related components for an undeclared uranium-enrichment programme. It also gave Libya documentation related to designing nuclear weapons.⁵⁶ However, the relatively low technical absorption capacity of Libya's scientific-industrial base meant that these 'short cuts' did not bring it appreciably closer to achieving a nuclear weapon capability.

Cooperation with the IAEA

At a meeting on 20 December 2003, Libyan officials informed the IAEA that the country had been engaged for more than a decade in undeclared nuclear activities aimed at producing material for 'internationally proscribed weapons'.⁵⁷ On 28 December IAEA Director General Mohamed ElBaradei travelled to Tripoli with a team of senior inspectors to 'initiate an in-depth process of verification of Libya's past and present nuclear activities'.⁵⁸ During the visit, ElBaradei was informed by the Libyan authorities that Libya's nuclear programme involved a total of 12 sites, 4 of which were previously undeclared. Some of the sites shown to ElBaradei housed unopened crates of dual-use equipment, including dozens of gas centrifuges for uranium enrichment, provided by foreign manufacturers. Based on these preliminary inspections, the IAEA determined that Libya's military nuclear programme had most likely been 'in the very initial stages of development'.⁵⁹

⁵³ Federation of American Scientists (note 45).

⁵⁴ US Central Intelligence Agency, 'Unclassified report to Congress on the acquisition of technology relating to weapons of mass destruction and advanced conventional munitions, 1 January through 30 June 2002', URL <http://www.cia.gov/cia/reports/721_reports/jan_jun2002.html#6>.

⁵⁵ On the Khan network see chapter 12 in this volume.

⁵⁶ Tyler, P. and Sanger, D., 'Pakistan called Libyans source of atom design', *New York Times* (Internet edn), 6 Jan. 2004, URL <<http://www.nytimes.com/2004/01/06/international/middleeast/06NUKE.html>>.

⁵⁷ IAEA, 'IAEA Director General to visit Libya', Press Release 2003/14, Vienna, 22 Dec. 2003, URL <<http://www.iaea.org/NewsCenter/PressReleases/2003/prn200314.html>>.

⁵⁸ IAEA (note 57).

⁵⁹ 'Libya "not close to nuclear arms"', BBC News Online, 29 Dec. 2003, URL <<http://news.bbc.co.uk/2/hi/africa/3355277.stm>>; and Koppel, A., 'ElBaradei: Libya nuclear program dismantled',

In February 2004 ElBaradei submitted a report to the IAEA Board of Governors stating that Libya had failed to meet its obligations under its safeguards agreement with the IAEA.⁶⁰ The report stated that, beginning in the early 1980s, Libya imported nuclear material and conducted a wide variety of nuclear activities which it had failed to report to the IAEA, as required by its safeguards agreement. It also did not declare the facilities and other locations where the material had been stored and processed.

On 10 March 2004, the IAEA Board of Governors adopted a resolution finding that Libya's past failures to meet the requirements of its safeguards agreement with the agency, as identified by the Director General, 'constituted non-compliance' under Article XII.C of the IAEA Statute.⁶¹ In accordance with the Statute, the resolution requested ElBaradei to report the matter to the UN Security Council. However, it also stated that the report to the Security Council was 'for information purposes only' and commended Libya 'for the actions it has taken to date, and has agreed to take, to remedy the non-compliance'.⁶² The Security Council subsequently declined to consider punitive measures against Libya.⁶³

On 10 March Libya signed an Additional Protocol to its safeguards agreement with the IAEA.⁶⁴ The protocol grants greater authority to IAEA inspectors in verifying that Libya has not diverted safeguarded nuclear materials for proscribed purposes or built undeclared nuclear facilities.⁶⁵ Libya announced that it would abide by the protocol's provisions prior to its ratification and entry into force.⁶⁶ On 26 May 2004, Libya submitted the initial expanded declaration required under the Additional Protocol.

During the spring and summer of 2004 Libya and the IAEA discussed how to provide a full account of Libya's past nuclear activities and how to clarify a number of safeguards-related issues. On 30 August ElBaradei reported to the Board of Governors that Libya had shown 'good co-operation with the Agency' since December 2003, including providing prompt access to locations and senior personnel requested by the agency; it also had taken 'corrective

CNN International (Internet edn), 29 Dec. 2003, URL <<http://edition.cnn.com/2003/WORLD/africa/12/29/libya.nuclear/index.html>>.

⁶⁰ IAEA, 'Implementation of the NPT safeguards agreement of the Socialist People's Libyan Arab Jamahiriya', Report by the Director General to the IAEA Board of Governors, GOV/2004/12, Vienna, 20 Feb. 2004, pp. 7-8, URL <<http://www.iaea.org/Publications/Documents/Board/2004/gov2004-12.pdf>>.

⁶¹ IAEA, 'Implementation of the NPT Safeguards Agreement of the Socialist People's Libyan Arab Jamahiriya', Resolution adopted by the IAEA Board of Governors, GOV/2004/18, Vienna, 10 Mar. 2004, p. 2, URL <<http://www.iaea.org/Publications/Documents/Board/2004/gov2004-18.pdf>>. The IAEA Statute is available at URL <http://www.iaea.org/About/statute_text.html>.

⁶² IAEA (note 61), p. 2.

⁶³ United Nations News Service (note 20).

⁶⁴ IAEA, 'IAEA verification of Libya's nuclear programme: Board adopts resolution, Libya signs Additional Protocol', Press Release, 10 Mar. 2004, URL <http://www.iaea.org/NewsCenter/News/2004/libya_ap1003.html>. Libya has also ratified the CTBT (note 1).

⁶⁵ For further detail about the Model Additional Protocol contained in INFCIRC/540, Sep. 1997, see IAEA, 'The safeguards system of the International Atomic Energy Agency', IAEA Department of Safeguards, Vienna, URL <http://www.iaea.org/OurWork/SV/Safeguards/safeg_system.pdf>.

⁶⁶ IAEA (note 64). As of 31 Dec. 2004, Libya's Additional Protocol had not entered into force.

actions' to come into compliance with its safeguards agreement.⁶⁷ He noted, however, that Libya had not always been able to provide adequate documentation in its account of its nuclear activities, especially those for which the assistance was provided by foreign intermediaries. In these instances, the IAEA's verification activities 'would benefit greatly from the provision of additional information, including from the provider of the weapon design and fabrication information and from those contractors which helped Libya develop some of its dual use infrastructure'.⁶⁸

Safeguards compliance issues

ElBaradei's reports to the IAEA Board in 2004 included detailed descriptions of Libya's nuclear programme and of its failure to comply with its safeguards obligations.

Imports of nuclear materials. In 1985 Libya exported uranium ore concentrate ('yellowcake') to a 'nuclear weapon state', which then processed it and shipped the resulting products, including uranium hexafluoride (UF₆), back to Libya later in the year. Libya acknowledged that it had failed to declare the import of the UF₆ and other uranium compounds subject to safeguards to the IAEA.⁶⁹ The materials were intended to serve as samples for a uranium conversion facility but were never used. Libya had also failed to declare the import of three cylinders of UF₆ supplied by another country, through clandestine intermediaries, in September 2000 and February 2001.⁷⁰ Pakistan has been identified in some reports as the source of the UF₆.⁷¹ In early 2005 US intelligence agencies concluded, based on the presence of certain isotopes in the UF₆ containers turned over by Libya to the USA, that the material had originated in North Korea.⁷²

Uranium conversion. Libya conducted undeclared laboratory- and bench-scale uranium conversion experiments using imported uranium ore between

⁶⁷ IAEA, 'Implementation of the NPT safeguards agreement of the Socialist People's Libyan Arab Jamahiriya', Report by the Director General to the IAEA Board of Governors, GOV/2004/59, Vienna, 30 Aug. 2004, p. 7, URL <<http://www.iaea.org/Publications/Documents/Board/2004/gov2004-59.pdf>>.

⁶⁸ IAEA (note 67).

⁶⁹ IAEA, 'Implementation of the NPT safeguards agreement of the Socialist People's Libyan Arab Jamahiriya', Report by the Director General to the IAEA Board of Governors, GOV/2004/33, Vienna, 28 May 2004, Annex 1, p. 3, URL <<http://www.iaea.org/Publications/Documents/Board/2004/gov2004-33.pdf>>.

⁷⁰ IAEA (note 69).

⁷¹ Citing British and US intelligence officials, a report from a police investigation into the involvement of Malaysian firms in the Khan network stated that Pakistan sent uranium hexafluoride to Libya in 2001. Royal Malaysia Police, 'Press release by Inspector General of Police in relation to investigation on the alleged production of components for Libya's uranium enrichment programme', 20 Feb. 2004, URL <http://www.rmp.gov.my/rmp03/040220_scomi_eng.htm>.

⁷² However, scientists at the IAEA and some non-governmental experts concluded that the US test results were ambiguous and pointed with equal likelihood to Pakistan as the source of the uranium hexafluoride. Kessler, G., 'North Korea may have sent Libya nuclear material, US tells allies', *Washington Post* (Internet edn.), 2 Feb. 2005, URL <<http://www.washingtonpost.com/wp-dyn/articles/A55947-2005Feb2.html>>.

1983 and 1989 as well as ‘limited’ experiments after 1994.⁷³ Libya failed to provide the IAEA with design information for the facilities at the TNRC where these experiments took place. Libya also failed to provide design information for a pilot-scale uranium conversion facility (UCF) which it ordered, in the form of portable modules, from a ‘Far Eastern’ manufacturer in 1984.⁷⁴ Libyan officials have stated that uranium was never processed at the UCF, which was moved between several locations for security reasons following its assembly in 1998, although some cold tests were conducted in 2002.

Uranium enrichment. Libya had an undeclared uranium enrichment programme under way for two decades. This included a pilot centrifuge facility for which Libya failed to provide to the IAEA design information in a timely manner, as it was obligated to do under its safeguards agreement. In addition, through the Khan network, Libya had ordered what was in effect a ‘turnkey’ enrichment plant for which the network would provide the centrifuge parts, with final assembly to take place in Libya.⁷⁵

In the early 1980s Libya initiated a research and development (R&D) programme for gas centrifuge uranium enrichment, using a design brought to Libya by a European expert.⁷⁶ This did not result in a working centrifuge system but gave Libyan scientists experience in designing and operating centrifuges and related equipment. Following a 1995 decision to reinvigorate its nuclear weapon-related activities, Libya acquired from the Khan network 20 pre-assembled L-1 centrifuges and the components for another 200.⁷⁷ Libyan scientists constructed three different enrichment cascades, but only the smallest (using nine centrifuges) was completed. Libya stated that no nuclear material had been used during any of the tests conducted on the L-1 centrifuges.

In 2002 Libya received from the Khan network two centrifuges of a more advanced design (L-2) and placed an order for an additional 10 000 L-2 centrifuges. By late December 2003 a considerable number of centrifuge components, primarily casings, had arrived in Libya. Most of the parts had been manufactured by a Malaysian company—Scomi Precision Engineering (SCOPE)—in a deal arranged by a Sri Lankan business associate of Khan. Several British, German and Swiss citizens were also involved in the deal as technical, manufacturing and trans-shipment experts.⁷⁸ It remains unclear,

⁷³ IAEA (note 60), p. 4; and IAEA (note 69), Annex 1, pp. 3–4.

⁷⁴ According to media reports, a Japanese manufacturer sold the conversion facility to Libya, based on Libyan design specifications. Charbonneau, L., Reuters, ‘Japanese firm sold Libya uranium conversion plant’, 12 Mar. 2004, URL <<http://in.news.yahoo.com/040312/137/2byvq.html>>; and MSNBC News/Associated Press, ‘Japan firm sold Libya key nuclear technology’, 12 Mar. 2004, URL <<http://msnbc.msn.com/id/4514496>>.

⁷⁵ Albright, D. and Hinderstein, C., Institute for Science and International Security (ISIS), ‘Libya’s gas centrifuge procurement: much remains undiscovered’, *Issues Brief*, 1 Mar. 2004, URL <http://www.isis-online.org/publications/libya/cent_procure.html>.

⁷⁶ IAEA (note 69), Annex 1, p. 5.

⁷⁷ The L-1 centrifuge is an IAEA designation for an older design of European origin, also referred to as G-1 or P-1.

⁷⁸ Royal Malaysia Police (note 71); Gertz, B., ‘Libyan sincerity on arms in doubt’, *Washington Times* (Internet edn), 9 Sep. 2004, URL <<http://www.washingtontimes.com/functions/print.php?storyID=>

however, where the centrifuge rotors were made, leading to concern that they may have been shipped by an as-yet unidentified supplier in the Khan network. A German-owned freighter bound for Tripoli from Dubai that was intercepted in October 2003 had been carrying some of the centrifuge components. According to the IAEA, all centrifuge components found inside Libya were manufactured by foreign companies. The advanced centrifuges procured by Libya were similar to those built by Iran based on designs obtained from Pakistan.⁷⁹ Some reports indicate that suppliers from South Africa and Turkey also sold Libya advanced centrifuge components.⁸⁰

Environmental samples taken by the IAEA inspectors found that a number of the L-1 and L-2 centrifuges had been contaminated with traces of highly enriched uranium (HEU) and low-enriched uranium (LEU). Both types of enriched uranium were found in a test facility for the L-1 centrifuges. ElBaradei reported that the IAEA's investigation 'tended to confirm' Libya's assertion that it had not tested the centrifuges with nuclear material and that the components were contaminated when Libya received them.⁸¹

Reprocessing. In 1984–90 Libya conducted undeclared experiments at the 10-MW research reactor at the TNRC involving the fabrication of several dozen uranium dioxide and uranium metal targets, and their subsequent irradiation to produce fission product radioisotopes. Libya has indicated that small quantities of plutonium were separated from at least two of the targets. Libya did not report either the experiments or the separated plutonium at the time and failed to provide design information for the radiochemical laboratory where the work was carried out.

ElBaradei reported to the IAEA Board that, in late 2001 or early 2002, Libya had received 'from a foreign source' at least one set of design plans for a nuclear weapon.⁸² The documents shown to IAEA inspectors by the Libyan authorities included a series of engineering drawings relating to nuclear weapon components and detailed notes on the fabrication of weapon components. According to one report, the bomb designs depicted in the blueprints were for a 10-kiloton implosion-type weapon that China had detonated in its fourth nuclear test, in 1966. The design was notable because it was compact and the first one that China had developed that could easily fit on a ballistic

20040909-121930-9087r>; and 'German held in Libya arms probe', BBC News Online, 16 Nov. 2004, URL <<http://news.bbc.co.uk/2/hi/europe/4017789.stm>>.

⁷⁹ IAEA (note 67), pp. 5–6; and Tyler and Sanger (note 56).

⁸⁰ Fidler, S. and Huband, M., 'Turks and South Africans "helped Libya's secret nuclear arms project"', *Financial Times* (Internet edn), 10 June 2004, URL <<http://search.ft.com/s03/search/article.html?id=040610001054>>.

⁸¹ IAEA (note 69), Annex 1, p. 6. The report emphasized that the cooperation of the 'supplier State' (i.e., Pakistan) was essential for the agency to be able to determine the origins of the contamination.

⁸² IAEA (note 60), p. 6.

missile.⁸³ The plans were believed to have been transferred by China to Pakistan in the 1980s and later sold by the Khan network to Libya.⁸⁴

Libya has stated that the entity in charge of the nuclear weapon programme—the National Board for Scientific Research (NBSR)—did not act on the design information, or even attempt to assess its credibility and practical utility, because it had no national personnel competent to evaluate the data.⁸⁵ IAEA experts did not find evidence that any of the inspected facilities which had technical capabilities relevant for a nuclear weapon programme (e.g., laboratories, precision machine tools and other equipment) had been involved in the design, production or testing of the weapon components.⁸⁶

In late January 2004, pursuant to an agreement between the IAEA, the UK and the USA which was reached after reportedly difficult negotiations, all of the documents and drawings related to nuclear weapon design and fabrication were transferred, under IAEA seal, to the USA. In addition, in January–March 2004 Libya shipped to the USA's Oak Ridge National Laboratory all centrifuges, centrifuge components and associated equipment as well as sensitive nuclear materials, including several containers of UF₆, for secure storage and disposal.⁸⁷ In March 2004 Russia also removed 13 kilograms of research reactor fuel assemblies containing 80 per cent HEU which it had supplied in the 1980s to the 10-MW research reactor at the TNRC.⁸⁸ The reactor will be converted to use LEU fuel.

VI. Libya's biological and chemical weapon programme

Biological weapons

The 1993 Russian SVR report concluded that Libya was conducting preliminary research work in the BW field. The report noted that Libya had shown a marked interest in work carried out with BW agents in other countries and stated that Libyan officials had indicated to other Arab countries that Libya was 'prepared to finance joint biological programmes, including those of an applied military' nature on condition that such work be conducted in Libya.⁸⁹

⁸³ Sanger, D. and Broad, W., 'As nuclear secrets emerge in Khan inquiry, more are suspected', *New York Times* (Internet edn.), 26 Dec. 2004, URL <<http://www.nytimes.com/2004/12/26/international/asia/26.nuke.html>>.

⁸⁴ Broad, W. and Sanger, D., 'Warhead blueprints link Libya project to Pakistan figure', *New York Times* (Internet edn), 4 Feb. 2004, URL <<http://www.nytimes.com/2004/02/04/politics/04nuke.html>>; and Warrick, J. and Slevin, P., 'Libyan arms designs traced back to China', *Washington Post* (Internet edn), 15 Feb. 2004, URL <<http://www.washingtonpost.com/ac2/wp-dyn/A42692-2004Feb14>>.

⁸⁵ IAEA (note 69), Annex 1, p. 7.

⁸⁶ IAEA (note 69), Annex 1, p. 7.

⁸⁷ Warrick, J., 'US displays nuclear parts given by Libya', *Washington Post* (Internet edn), 16 Mar. 2004, URL <<http://www.washingtonpost.com/ac2/wp-dyn/A61439-2004Mar15>>; and IAEA (note 69), Annex 1, p. 6.

⁸⁸ Squassoni, S. and Feickert, A., Congressional Research Service, *Disarming Libya: Weapons of Mass Destruction*, CRS Report for Congress RS 21823, 22 Apr. 2004, p. 5, URL <<http://fpc.state.gov/documents/organization/32007.pdf>>. On nuclear disarmament see chapter 16 in this volume.

⁸⁹ Russian Foreign Intelligence Service (SVR) (note 40).

During the trilateral process 'no concrete evidence of an existing' BW programme was uncovered.⁹⁰ The UK and the USA reportedly hold the view that certain agricultural and pharmaceutical facilities 'were established with biological weapons also in mind'.⁹¹ However, without access to internal policy documentation it would probably be impossible to determine whether such a programme was 'defensive' (i.e., permitted by the BTWC) or 'offensive' (i.e., prohibited by the BTWC).⁹²

Chemical weapons

The SVR report concluded that Libya possessed a CW stockpile totalling 70–80 tonnes and that it had recently produced phosgene, sarin and sulphur mustard in limited quantities. It stated that Libyan efforts to obtain production technology from Iran and Iraq had been unsuccessful and that, by 1992, the international sanctions had compelled Libya to scale back its CW production capacity and to convert parts of more than one facility for the production of medicines. The report stated that these activities were concentrated at a chemical factory located at Rabta, which had been established to produce sulphur mustard, and that it could not confirm information that CW production equipment and approximately 50 tonnes of sulphur mustard had been destroyed.⁹³ The SVR report stated that some experts had expressed concern that research might be conducted at a military scientific facility in the Gharyan region where foreign laboratory equipment and 'critical chemical components' were being brought together.⁹⁴

In the early to mid-1990s the USA alleged that Libya was constructing an underground CW production facility at Tarhunah; Libya claimed that the facility was part of the Great Man-Made River Project.⁹⁵ During the same period a number of German businessmen were criminally prosecuted for selling Libya dual-use chemical process equipment that could be adapted for the production of nerve agent.⁹⁶

⁹⁰ Slevin and Pincus (note 43).

⁹¹ 'Libya and "dual use"', *CBW Conventions Bulletin*, no. 65 (Sep. 2004), p. 1.

⁹² Historically, a defensive BW programme could be understood to mean a programme in which BW would be used for retaliatory purposes. Under current international law, however, BW may not be used under any circumstances. A defensive programme is therefore one where BW agents are evaluated for protective or prophylactic purposes only. See Roffey, R., 'Biological weapons and potential indicators of offensive biological weapon activities', *SIPRI Yearbook 2004: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 2004), pp. 557–71.

⁹³ Russian Foreign Intelligence Service (SVR) (note 40). The fact that Libya may have destroyed sulphur mustard could indicate that the product had a limited shelf-life. See Perry Robinson, J. and Trapp, R., 'Production and chemistry of mustard gas', ed. S. J. Lundin, *Verification of Dual-use Chemicals under the Chemical Weapons Convention: The Case of Thiodiglycol*, SIPRI Chemical & Biological Warfare Studies no. 13 (Oxford University Press: Oxford, 1991), pp. 4–15.

⁹⁴ Russian Foreign Intelligence Service (SVR) (note 40).

⁹⁵ See Mark, C., Congressional Research Service, *Libya: Suspected Chemical Weapons Facility at Tarhunah*, Report no. 96–849 F (US Government Printing Office: Washington, DC, 23 Oct. 1996).

⁹⁶ Zanders, J. P., Eckstein, S. and Hart, J., 'Chemical and biological weapon developments and arms control', *SIPRI Yearbook: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 1997), p. 462–63; and Mark (note 95), pp. 1–4.

In mid-2003 the CIA stated that Libya ‘appeared to be working towards an offensive [chemical warfare] capability and eventual indigenous production’ and ‘evidence suggested’ that the country was seeking ‘dual-use capabilities that could be used to develop and produce BW agents’.⁹⁷ Later in 2003 the CIA stated that Libya had shown British and US visitors an unspecified amount of sulphur mustard that had been produced at Pharma 150 near Rabta more than 10 years earlier.⁹⁸

On 20 February 2004 Libya submitted a partial initial declaration to the OPCW, and, on 5 March 2004, following two technical assistance visits to Libya by the OPCW’s Technical Secretariat, Libya submitted its full initial declaration on its CW holdings and related activities.⁹⁹ It declared 3563 empty CW air bombs, 23.62 tonnes of sulphur mustard and more than 1000 tonnes of a Category 2 chemical,¹⁰⁰ which had been intended for use in the production of Category 1 CW.¹⁰¹ Libya also declared approximately 2000 tonnes of CW precursors not listed in the CWC Annex on Chemicals; the precursors had been intended to be used for purposes prohibited under the CWC.¹⁰² Libya stated that it had never transferred chemical weapons.¹⁰³ It also declared that it possessed an inactivated CW production facility at Rabta as well as two CW storage facilities.¹⁰⁴ In early 2004 Libya suspended the destruction of the empty CW air bombs at the request of the OPCW in order to allow it to verify their destruction. In March 2004 Libya completed the destruction of the bombs. In December 2004 the OPCW approved Libya’s request to convert a former sulphur mustard production facility at Rabta into a pharmaceutical production facility to produce pharmaceuticals.¹⁰⁵ It also approved an extension of the intermediate deadline for the destruction of its Category 1 CW.¹⁰⁶

⁹⁷ US Central Intelligence Agency, ‘Attachment A, Unclassified report to Congress on the acquisition of technology relating to weapons of mass destruction and advanced conventional munitions, 1 January through 30 June 2003’, URL <http://www.cia.gov/cia/reports/721_reports/jan_jun2003.htm>.

⁹⁸ US Central Intelligence Agency (note 42).

⁹⁹ ‘Summary: 36th session of the Executive Council’, *Chemical Disarmament Quarterly*, vol. 2, no. 2 (June 2004), p. 16.

¹⁰⁰ Category 2 chemical weapons are defined as CW that are not based on chemicals that appear on Schedule 1 of the CWC’s Annex on Chemicals and their parts and components. CWC, Verification Annex, Part IV(A), para. 16.

¹⁰¹ Category 1 chemical weapons are defined as CW that are based on chemicals that appear on Schedule 1 of the CWC’s Annex on Chemicals and their parts and components. CWC, Verification Annex, Part IV(A), para. 16.

¹⁰² ‘Summary: 36th session of the Executive Council’ (note 99), p. 16; and OPCW, ‘Destruction of chemical weapons in Libya commences on 27 February 2004’, Press Release no. 6, 26 Feb. 2004.

¹⁰³ The OPCW requires that states parties declare whether they have transferred CW at any time since 1 Jan. 1946. CWC, Article III, para.1(a)(iv).

¹⁰⁴ OPCW, ‘Initial inspection in Libya completed’, Press Release no. 10, 22 Mar. 2004. Some sources indicate that Libya declared 3 CW production facilities. ‘Libya and “dual use”’ (note 91), p. 2. The Rabta production facility had 2 production lines. Libya also had a mobile CW filling capability based in Tripoli. Spence, S., ‘Progress in The Hague: developments in the Organization for the Prohibition of Chemical Weapons, quarterly review no. 48’, *CBW Conventions Bulletin*, no. 66 (Dec. 2004), p. 11; and US Government official, Private communication with J. Hart, May 2004.

¹⁰⁵ OPCW, ‘Decision, Request by the Libyan Arab Jamahiriya to use the chemical weapons production facilities Rabta Pharmaceutical Factory 1 and Rabta Pharmaceutical Factory 2 (Phase II) in Rabta, the Libyan Arab Jamahiriya for purposes not prohibited under the Chemical Weapons Convention’, OPCW document C-9/DEC.9, 30 Nov. 2004. The CWC defines a chemical weapon production facility

It is evident that Libya stockpiled air bombs and sulphur mustard, but the exact nature of work with other agents is less clear. For example, Libya reportedly carried out experimental work with sarin and soman,¹⁰⁷ but no information regarding CW agents other than sulphur mustard appears to have been released by Libya or the OPCW. (Although Libya's declaration to the OPCW was not marked as restricted, the declaration has not been released owing to the OPCW's policy on confidentiality.¹⁰⁸) Despite allegations dating from the early 1990s that Libya had or was constructing two underground CW production facilities at Sebha and Tarhunah, British and US officials apparently found no such facilities and none was declared to the OPCW.¹⁰⁹ Finally, it is significant that Libya declared chemicals that were not listed in the CWC's Annex on Chemicals but had been meant for use as part of its CW programme. In so doing, Libya was implementing the CWC's general purpose criterion (GPC), which bans all toxic materials and their precursors except where intended for purposes not prohibited by the CWC.¹¹⁰

VII. Libya's ballistic missile programme

Libya's programmes to develop ballistic missiles and to obtain ballistic missile-related equipment, materials, technology and expertise from foreign sources have been the focus of international attention for two decades.¹¹¹ During the 1980s Libya received missile-related assistance from a West German firm and reportedly approached Brazil for missile assistance.¹¹² There has been particular concern that Libya was seeking to produce or otherwise acquire ballistic missiles as delivery systems for NBC weapons.

(CWPF) essentially as any facility that produced CW at any time since 1 Jan. 1946. CWC, Article II, para. 8. Under the CWC, a CWPF must either be destroyed, temporarily converted for use as a CW destruction facility or permanently converted for purposes not prohibited by the CWC. If a former CWPF has already been converted for non-prohibited purposes when the CWC enters into force for the state party, it must seek approval for its conversion from the OPCW. CWC, Verification Annex, Part V.

¹⁰⁶ OPCW, 'Decision, Request by the Libyan Arab Jamahiriya for extensions of the intermediate deadlines for the destruction of its Category 1 chemical weapons stockpiles', OPCW document C-9/DEC.7, 30 Nov. 2004. The CWC currently requires that conversion of CWPFs for non-prohibited purposes be completed no later than 6 years after it enters into force (i.e., no later than 19 Apr. 2003). CWC, Verification Annex, Part V, para. 72.

¹⁰⁷ 'Libya and "dual use"' (note 91), p. 1.

¹⁰⁸ See CWC, Annex on the Protection of Confidential Information ('Confidentiality Annex').

¹⁰⁹ 'Libya and "dual use"' (note 91), p. 2.

¹¹⁰ CWC, Article II, para. 1. The GPC is the key mechanism by which the CWC can take into account technological and scientific change. It also allows those implementing the convention to better distinguish between 'offensive' (prohibited) and 'defensive' (permitted) CW programmes. Concern has periodically been expressed that the manner in which the CWC is being implemented is too narrowly focused partly because, since the convention's entry into force on 29 Apr. 1997, declarations and inspections have been focused on chemicals listed in the CWC's Annex on Chemicals.

¹¹¹ See, e.g., US Central Intelligence Agency (note 97).

¹¹² Federation of American Scientists (note 45); and Nuclear Threat Initiative (NTI), 'Libya: missile chronology, 1969–2004', 3 Dec. 2004, URL <http://www.nti.org/e_research/profiles/Libya/Missile/3840_3841.html>.

The bulk of Libya's ballistic missile inventory consisted of ageing FROG and Scud-B missiles which had been imported from the Soviet Union.¹¹³ In 1989 Libya concluded a deal with North Korea to purchase 60 Scud Mod-C missiles (known in North Korea as the Hwasong-6).¹¹⁴ Libya received an initial shipment of the missile (with a range of 500–600 km) in 1993–94, despite the existence of a UN arms embargo since March 1992.¹¹⁵ In 2000 there were reports that Libya had acquired from North Korea a small number of No-dong ballistic missiles (1300-km range) as part of a larger purchase. However, in 2001 the USA concluded that Libya had not received complete missiles and that its operational capability remain limited to Scud missiles.¹¹⁶

Libya made little progress in developing an indigenous medium-range ballistic missile or in extending the range of its Scud missiles. These programmes were heavily dependent on foreign assistance.¹¹⁷ Libya's missile assembly and production facilities were centred at the Al-Rabta and Tarhuna weapon complexes.¹¹⁸ Throughout the 1990s Libya had a missile with a range of 800–1000 km under development, called Al-Fatah. However, the programme was hampered by the imposition of UN sanctions between 1992 and 1999, which restricted the flow of ballistic missile technology to Libya. The Qadhafi regime reportedly had some success in circumventing sanctions and obtaining missile-related components and technology from companies in China, India and the former Yugoslavia.¹¹⁹ In the 1990s, Libya also maintained cooperation with Iran in developing missile technology and components.¹²⁰

Libya's missile force had only a limited capability to deliver non-conventional warheads. The 1993 Russian SVR report concluded that Libya was not capable of mounting nuclear warheads on its FROG and Scud missiles.¹²¹ Libya is believed to have developed CW warheads for its Scud-C missiles, possibly with Iranian and North Korean assistance, and may have sought to do so for its No-dong missiles.¹²² It does not appear that Libya had an active programme under way to develop a missile delivery system for

¹¹³ Bermudez, J., 'Ballistic missile development in Libya', *Jane's Intelligence Review*, vol. 15, no. 1 (Jan. 2003), p. 28; and Global Security.org, 'Libyan missiles', 21 Dec. 2003, URL <<http://www.globalsecurity.org/wmd/world/libya/missile.htm>>.

¹¹⁴ Bermudez (note 113), p. 28

¹¹⁵ Bermudez (note 113), pp. 28–29; and Nuclear Threat Initiative (NTI), 'Country profiles: Libya', Dec. 2004, URL <http://www.nti.org/e_research/profiles/Libya/index.html>.

¹¹⁶ Bermudez (note 113), pp. 28–29; and US Central Intelligence Agency, 'Unclassified report to Congress on the acquisition of technology relating to weapons of mass destruction and advanced conventional munitions, 1 July through 31 December 2001', URL <http://www.cia.gov/cia/reports/721_reports/july_dec2001.htm#6>.

¹¹⁷ US Central Intelligence Agency, National Intelligence Council, *Foreign Missile Developments and the Ballistic Missile Threat through 2015*, Dec. 2001, URL <http://www.cia.gov/nic/special_missile_threat2001.html>; and US Department of Defence (note 47), p. 47.

¹¹⁸ Bermudez (note 113), p. 31.

¹¹⁹ US Department of Defence (note 47), p. 47; and Gertz, B., 'Serbia is helping Libya with ballistic missiles, CIA says', *Washington Times* (Internet edn), 12 Nov. 1996, p. A3, URL <<http://www.fas.org/news/libya/wt961112.htm>>.

¹²⁰ Bermudez (note 113), p. 29.

¹²¹ Russian Foreign Intelligence Service (SVR) (note 40).

¹²² Bermudez (note 113), pp. 28, 29.

nuclear warheads. The Libyan authorities have told the IAEA that no institutional interaction took place between the NBSR and the organization responsible for missile activities, the Central Organization for Electronic Research (COER).¹²³

As part of the announcement made by Libya in December 2003 that it would eliminate all elements of its NBC weapon programmes, it pledged to dismantle all ballistic missiles capable of carrying a 500-kg payload beyond 300 km.¹²⁴ In September 2004 the USA announced that its verification of the dismantling of Libya's NBC weapon programmes, including 'MTCR-class missiles', was 'essentially complete'.¹²⁵ Libya had turned over to British and US experts its inventory of operational Scud-C missiles as well as partially assembled missiles, missile launchers and related equipment. Libya also pledged to eliminate entirely its arsenal of Scud-B missiles at the end of their operational service. Earlier in 2004 Libya had indicated that it wanted to convert these into shorter-range missiles for defensive purposes.¹²⁶ In addition, Libya undertook to sever its military trade ties with Iran, North Korea (including cooperation on developing medium-range ballistic missiles) and Syria. Libya's fulfilment of its December 2003 pledge will leave it primarily with shorter-range cruise missiles.¹²⁷

VIII. Conclusions

Although US officials have cited Libya as an example of the effectiveness of ad hoc approaches and the threat of pre-emptive military action, it is unclear how the Libya 'model' might be applied to other states. No other country of concern has indicated its willingness to submit to a similar process, and it is unclear what additional incentives, in terms of 'carrots' and 'sticks', might be offered to such countries in the current international security environment to cause them to reconsider their strategic choices. Over the long term, a key factor that will determine how both Libya and others will view the merits of its choice is the actual and perceived benefits Libya obtains through *inter alia* resumed international trade and unrestricted relations with outside institutions. For example, in 2004 the cooperative threat reduction model was extended to

¹²³ IAEA (note 69), Annex 1, p. 7.

¹²⁴ These correspond to the performance criteria that define category I items, as set out in the MTCR guidelines regulating the transfer of complete missile systems. The complete guidelines are available at the MTCR Internet site at URL <<http://www.mtcr.info/english/guidelines.html>>. On MTCR see chapter 17 in this volume.

¹²⁵ US Department of State, 'Completion of verification work in Libya', Paula A. DeSutter, Assistant Secretary for Verification and Compliance, Testimony Before the Subcommittee on International Terrorism, Nonproliferation and Human Rights, Washington, DC, 22 Sep. 2004, URL <<http://www.state.gov/t/vc/rls/rm/2004/37220.htm>>.

¹²⁶ Miller, J., 'US says Libya will convert missiles to defensive weapons', *New York Times* (Internet edn), 11 Apr. 2004, URL <<http://www.nytimes.com/2004/04/11/international/africa/11LIBY.html>>.

¹²⁷ Bhattacharjee, A. and Salama, S., 'Libya and nonproliferation', CNS Research Story, Center for Nonproliferation, Monterey Institute of International Studies, 24 Dec. 2003, URL <<http://cns.miis.edu/pubs/031223.htm>>. Libya will retain the SS-N-2c Styx, Otomat Mk2 and Exocet anti-ship cruise missiles.

include a programme for redirecting the work of former scientists and technicians who were part of Libya's NBC weapon and medium- and long-range missile programmes in Libya.¹²⁸

The case of Libya also demonstrates the 'dual-use' difficulties inherent in efforts to prevent a state from misusing matériel, technology and equipment for developing BW and CW. Determining a state's intent is often the principal difficulty in assessing its compliance with its treaty commitments and the nature of the threat it may pose. Intelligence information on the matter is often ambiguous, and political or ideological disagreements may make it hard for states to be frank with each other about compliance, particularly outside multilateral frameworks. States are reluctant to share with others the intelligence underpinning their concerns, especially with an organization that is open to universal membership. In the Libya case, information on criminal proceedings within the UN framework was more readily shared among states and acted on than corresponding information on possible NBC weapon programmes.

On the other hand, the Libya case also demonstrated the value of having a multilateral body confirm (and in effect legitimize) the country's declarations and treaty compliance status. Libya's commitments regarding nuclear weapons and CW were verified through a system of declarations and on-site inspections carried out by international bodies. In the case of BW, however, the international community will have to essentially rely on information provided to the BTWC parties by Libya, the UK and the USA. This is also true with respect to Libya's missile programme. In addition, the IAEA and the USA appear to have disagreed over what, if any, role US officials should have in the IAEA inspection process.¹²⁹

Concern has been expressed that the UK, the USA and other states may have overlooked other problems—such as human rights, despite the USA's much publicized drive for greater democracy in the Arab world—in granting Libya so many benefits for its renunciation of NBC weapons and advanced-capability missiles. In fact, the UK and the USA have been reported to be pursuing their dialogue with Libya on the country's foreign and domestic policies, including human rights and other matters of concern.¹³⁰ As of October 2004 the USA was continuing to review Libya's 'record of support for terrorism'.¹³¹

¹²⁸ For background see Roston, M., *Redirection of WMD Scientists in Iraq and Libya: a Status Report* (Russian American Nuclear Security Advisory Council: Washington, DC, Apr. 2004); and chapter 17 in this volume.

¹²⁹ Global Security.org, 'US, Britain to hold talks with IAEA over Libya's nuclear issue', 18 Jan. 2004, URL <<http://www.globalsecurity.org/wmd/library/news/libya/2004/libya-040118-pla-daily01.htm>>.

¹³⁰ Dunne (note 9), p. 4.

¹³¹ E.g., the USA has expressed the view that Libya 'may have some residual contacts with some of its former terrorist clients'. In Oct. 2004 the head of the American Muslim Council, Abdulrahman Alamoudi, was convicted and sent to prison for plotting to assassinate a member of the Saudi royal family, reportedly at the instigation of the Libyan Government. US Department of State (note 5).