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AIR UNIVERSITY

NEGATING THE THREAT OF LIBYAN
WEAPONS OF MASS DESTRUCTION

by

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Preface

Readers of this paper might assume I chose to examine the issue of negating the threat of Libyan weapons of mass destruction as a result of the terrorist attacks of September 11, 2001. My interest and research on this topic started well before that terrible day. I recognized the need for serious study of this and related topics when my classes at the Air War College finally exposed me to the magnitude of the threat such weapons pose when in the hands of irresponsible leaders.

My major source of support and guidance on this paper has been Dr. Barry Schneider, Director of the Air Force Counterproliferation Center at Maxwell Air Force Base, Alabama. Dr. Schneider was my advisor for this paper and the two other papers that formed the foundation for this work. His expertise and ability to challenge us to dig into the core of these issues have been inspiring to my fellow classmates and me. In addition, I must acknowledge Colonel Bob Sutton and Dr. Buck Grinter for their superior instruction in the classes that I took at the Counterproliferation Center. Finally, I am most thankful for the patience and understanding provided by my wife Tanya, and our children Laura and Joshua, who supported me even when I spent more time with this paper than with them.

Abstract

The global war on terror illustrates a major change in the way the United States will have to use its military forces in the future. It is a war against not just governments but individuals with no solid national ties. We recognize that the American formula for success in past wars will not work in all of our future wars, and our ability to recognize the enemy and the threat he poses will be critical to our ability to defend American national interests.

Two of the biggest threats to peace and stability in the world today are terrorism and the proliferation of weapons of mass destruction. President Bush has made it clear that those countries that support terrorism or acquire and use weapons of mass destruction represent the enemies of the United States and her allies. One such nation, though not specifically listed as a member of the “Axis of Evil” in the president’s 2002 State of the Union address, is Libya. Since coming to power in a coup in 1969, Libyan dictator Muammar Qadhafi has been on a collision course with American presidents angry over the dictator’s support for global terrorism. They also recognized that Qadhafi’s quest for nuclear, biological, and chemical weapons posed an unacceptable threat to peace in the Middle East. The United Nations likewise recognized the Libyan threat and joined the United States in imposing sanctions on the dictator to force his compliance with internationally accepted standards of behavior.

The sanctions imposed on Libya, compounded by the end of the Cold War and the country’s loss of support from the former Soviet Union, have caused a steady economic

decline in Libya and a period of political isolation from many of the other countries in the world. Muammar Qadhafi has recently signaled a willingness to change his ways and cooperate with his former enemies, especially the United States, in exchange for a revocation of the remaining sanctions against Libya and the resumption of trade with the world's major powers. Libya has a lot to offer, including a vast oil production base and a strategically important location in the Middle East. Qadhafi's true intentions are in doubt, however, so the United States is proceeding cautiously as it explores the possibility new relations with Libya. The potential benefits for all countries are enormous, but so is the risk of inadvertently helping Libya further its quest for weapons of mass destruction. Therein lies the challenge for the United States—how to make the most of a possible future ally without succumbing to political expediency by prematurely taking pressure off Qadhafi and his regime.

Chapter 1

Introduction

...States like these, and their terrorist allies, constitute an axis of evil, arming to threaten the peace of the world. By seeking weapons of mass destruction, these regimes pose a grave and growing danger. They could provide these arms to terrorists, giving them the means to match their hatred. In any of these cases, the price of indifference would be catastrophic. We will work closely with our coalition to deny terrorists and their state sponsors the materials, technology, and expertise to make and deliver weapons of mass destruction...America will do what is necessary to ensure our nation's security.¹

—President George W. Bush
2002 State of the Union Address to Congress

With these words, United States President George W. Bush committed his country to a new war against the forces that would use terror and weapons of mass destruction against peaceful nations and their peoples. Following the attacks of 11 September 2001, the whole world watched to see how the United States would respond to the attacks on the American homeland. The magnitude of that response will set the tone for all future efforts to end the threat of worldwide terrorism.

Though not specifically included in President Bush's "axis of evil," Libya has been antagonistic toward the United States since the 1969 coup d' etat that thrust Colonel Muammar Qadhafi into power. Libya's history of support for terrorist organizations has cost countless lives and millions of dollars around the world. Because of his deliberate support for terrorism and terrorist groups operating against predominantly Western

targets, the United States declared Qadhafi's Libya a "State Sponsor of Terrorism" on December 29, 1979.² Under Qadhafi's leadership, Libya has become a sworn enemy of both Israel and the United States, and a leading customer of technology for producing weapons of mass destruction (WMD).

This paper will take an in-depth look at factors influencing Colonel Qadhafi's behavior as the dictator of Libya. It will discuss Colonel Qadhafi's pursuit of large conventional armed forces and his eventual focus on acquiring weapons of mass destruction. It then provides an analysis of Libya's biological, nuclear, and chemical weapons programs, Libya's history of using weapons of mass destruction against Qadhafi's foes, and some of Qadhafi's means for employing these weapons against his enemies in the future.

Next, the paper focuses on Libya's oil industry as the major source of revenue and how this resource could be preserved and rebuilt as Libya's future means for rebuilding its economy. The discussion then turns to various theories for deterring Qadhafi and other rogue leaders. The paper examines some of the reasons why Qadhafi should consider reconciling with the United States and how that change would benefit other countries as well. It explains some positive signals Qadhafi has sent in recent years, how the United States and the international community have reacted to his apparent offers of peace, and Qadhafi's response to those offers. Finally, this paper includes some broad recommendations for the future of U.S. – Libya relations.

Notes

¹ Office of the Press Secretary, "President Delivers State of the Union Address," 29 January 2002, on-line, Internet, n.p., 20 Apr 02, available from <http://www.whitehouse.gov/news/releases/2002/01/print/20020129-11.html>.

Notes

² U.S. Department of State Bureau of Public Affairs, "Background Notes: Libya," July 1994, n.p., on-line, Internet, 13 February 2002, available from <http://dosfan.lib.uic.edu/ERC/bgnotes/nea/libya9407.html>.

Chapter 2

Muammar Qadhafi's Motivation

We see the Israelis announcing their acceptance of a friendly solution that satisfies the Arabs. The first solution they accept is their distribution throughout the Arab world as protected minorities, putting their expertise at the service of the Arabs, because this will be one million times better than their staying in Palestine, as a Jewish state within sight of the Frightening Fourth Reich.³

—Muammar Qadhafi

Though this paper does not include a detailed personal history of Muammar Qadhafi, it is important to understand his basic motivations over the years. Some experts see Qadhafi as the one leader who clung most closely to the teachings of the late Egyptian President Gamal Abdel-Nasser, and the doctrines of pan-Arabism.⁴ Others feel his actions over the years reveal no predictable pattern of behavior or firm beliefs. There are strong indications that Qadhafi will adapt his ideology to whatever model will assure the survival of his regime.⁵ Still, his hatred of Israel—and of the United States for its years of support for the Israelis—has been consistent through the years, with only recent hints at a possible change of heart. Like many in the region, his negative feelings toward Israel are grounded in a combination of his disapproval of the Israeli State's very right to exist, and in his fears of attack by clearly superior Israel forces.⁶

Muammar Qadhafi's Quest for Power

Hoping to build his own power base and to raise the status of his country, Qadhafi made a concerted effort to build Libya's conventional armed forces in the years following his rise to power. Beginning in 1976, Libya poured over \$28 billion into its conventional forces, \$20 billion going to the Soviet Union.⁷ Libya bought military equipment from other countries as well, including Great Britain, Italy, France, the Netherlands, West Germany—and the United States.⁸ His air force swelled to an armada of over 550 modern fighters, and his army boasted 2,500 modern main battle tanks. The Libyan navy also benefited and became the largest and most modern fleet in North Africa.⁹ Under fire, however, the Libyan armed forces proved to be little more than a paper tiger, forcing Qadhafi to rethink his focus on his conventional forces. A series of embarrassing defeats at the hands of his enemies, large and small, caused Qadhafi to lose faith in the conventional forces that had absorbed so much of his country's oil profits over the years.

Recognizing the severity of the threat Qadhafi posed to the region, the United States opted to challenge Qadhafi's claims to a vast portion of the Mediterranean Sea in March 1981. Though the internationally agreed standard for sovereign waters extends 12 miles from a nation's shore, Qadhafi drew an imaginary line across the entire Gulf of Sidra, and asserted his right to use force against any vessels that approached to within 200 miles of the Libyan coast. In return, the United States exercised its international right to freedom of the seas by conducting naval fleet exercises in the Gulf of Sidra, knowing full well such actions would likely provoke a response from Qadhafi. On 19 August, two Libyan fighter jets challenged American F-14s operating over international waters. The Libyan

pilots fired at the F-14s, and were promptly shot down in a highly publicized and embarrassing military defeat for the Libyans.¹⁰

Libyan forces fared no better five years later when once again the United States exercised its freedom of navigation rights in the Gulf of Sidra in March 1986. The U.S. Navy conducted another series of exercises beyond Qadhafi's "Line of Death," hoping to put additional pressure on the Libyan dictator. Qadhafi responded by authorizing an attack on American ships that eventually left two of his own ships at the bottom of the sea.¹¹ Similarly, his naval commandos took part in a Palestinian seaborne attack on Israel in 1990 "which fizzled out in spectacular fashion."¹²

Another major setback for Qadhafi's conventional forces occurred in April 1986. Evidence linked his regime to the terror bombing of a German discotheque in which two Americans servicemen were killed. President Reagan retaliated with a daring air attack against military targets in Tripoli and Benghazi, specifically toward targets closely tied to the Libyan dictator's legitimacy as ruler rather than against the military and the Libyan populace. President Reagan's message: "...our fight is not with you, but with your leader."¹³ He was also trying to send a clear message to the dictator, as several of the jets were specifically assigned with attacking Qadhafi himself.¹⁴

The world saw an immediate change in Qadhafi's behavior following the attack, providing a clue to the level of trauma that the air strike induced in the Libyan leader. He immediately ceased making public appearances, choosing instead to broadcast only taped speeches during which he appeared "weary and traumatized."¹⁵ Americans accustomed to frequent news reports showing Qadhafi blasting the United States and Israel with his rhetoric saw no signs of him for months. He appeared to be dispirited not only by the

sudden and decisive confrontation with a sworn enemy, but even more so by the lack of support he received from his supposed followers.¹⁶

Not all of Qadhafi's military defeats came directly at the hands of the United States and Israel, whose military supremacy over the Libyans has never been questioned. In an attempt to flex his muscle among his neighbors in North Africa, Qadhafi sent his forces to claim territory along Libya's disputed border with neighboring Chad in 1987. With help from both France and the United States, Chadian forces quickly turned the tide of the battle against Libya and launched a counter-attack against a military installation in Libyan territory. Fearing failure, Qadhafi ordered his troops to employ mustard gas delivered from cargo aircraft and artillery against the enemy, but even this attack failed.¹⁷ Gas intended for Chadian troops blew back across his own troops.¹⁸ Qadhafi's conventional armed forces had proven themselves utterly incapable of repelling an attack on the Libyan homeland, and equally incapable of carrying out even a minor border skirmish against a relatively weak neighbor.

In light of this series of embarrassing defeats, Muammar Qadhafi appears to have lost faith in his conventional armed forces. As a result of his apparent disdain for these forces, as well as the economic sanctions levied against Libya by the United States and the United Nations, these forces have atrophied significantly over the years. Though his armed forces possessed a wide variety of weapon systems capable of delivering both conventional and unconventional weapons, including artillery, aircraft, and rocket launchers, this apparent abundance of weapons is misleading. Many of these weapons are in long-term storage, and his forces are overall poorly trained and led.¹⁹ Moreover, there is serious doubt whether the Libyan military would stand any chance against any

enemy employing modern equipment and tactics, especially if that enemy were able to achieve air superiority. Even with its relatively large air force, Libyan troops would be unlikely to hold their own in combat. Both his aging fighters and the transport aircraft he used to deliver chemical weapons on Chadian troops would make easy targets for a well-trained and equipped foe.²⁰ Therefore, nobody—including Qadhafi himself—seems to hold much faith in his conventional force’s ability to accomplish anything constructive on the field of battle.

Qadhafi’s lack of faith in his conventional forces appears to have caused him to take a radically unconventional view towards a national defense policy. Disregarding the viability of his regular forces he has said, “...the other means of defense is armed civilians and not [conventional] armies. Armies must be abolished because they have no future.”²¹ On another occasion, he stated that those armies have “no meaning and no role to play.”²² This indicates Qadhafi may have recognized that he is unlikely to be able to use his conventional military forces to exert his influence beyond his borders or to defend his country against most foes. Given his habit of changing direction whenever the situation warrants, one should not be surprised to see Qadhafi change his demeanor under these circumstances.

Positive Signals?

Years of military failures and of crippling international isolation and sanctions have forced Muammar Qadhafi to take a new tack with regard to his country’s relations with the rest of the world.²³ Some feel these steps provide concrete evidence that Qadhafi is attempting to shed his former status as a “rogue” leader. One positive sign: Libya’s state sponsorship of terrorism appears to be over.

According to the U.S. Department of State's report "Patterns of Global Terrorism," there is no evidence linking Libya to any terrorist activity in recent years.²⁴ The Libyan government has expelled the Abu Nidal Organization (ANO), a terrorist group previously known to have received training and other support from Libya.²⁵ Libya has cooperated with other nations' intelligence services in the region to remove the ANO from Libya—a move that has resulted in terrorist threats against Libya itself.²⁶ Further, the Libyan Government has imposed a new, more restrictive visa policy that will limit the ease by which terrorists from all suspect organizations enter the country. Finally, Libya has cooperated with many other countries in their efforts to expel terrorists, and has even extradited suspected terrorists to Jordan and Yemen.²⁷

In addition to distancing itself from terrorists and other radical Palestinian groups intent on disrupting the peace process, Libya has started demonstrating clear support for the Palestinian Authority (PA). Qadhafi officially recognized Chairman Yassir Arafat's leadership over the Palestinian people, and has told the Palestinians in Libya that the PA is "the only address for their concerns."²⁸ Surprisingly, Qadhafi even offered to let Israelis of Libyan descent return to Libya as long as their intentions are peaceful.²⁹

Qadhafi is also reaching out to his neighbors in hopes of ending his country's years of isolation. He is rapidly generating a wide range of bilateral relationships among his fellow African leaders, as well as leaders in Europe. Some of these states have steadily increased the frequency and level of their political engagements with Libya;³⁰ however, evidence also indicates the level of attention Qadhafi receives from his African neighbors is still directly tied to the frequency and magnitude of his "gifts" to them.³¹

These many new signs coming from the Qadhafi regime may portend a period of peaceful interaction between the United States and the Libyan State, or at a minimum, a lack of international problems linked directly to Tripoli. With these positive signs in mind, Qadhafi's apparent abandonment of his conventional armed forces would normally be further evidence of a reformed rogue, but covertly Qadhafi maintains hope of establishing Libya as a regional power by equipping himself with weapons of mass destruction. With that aim in mind, Libya has taken steps to upgrade its ability to develop and employ WMD of all kinds—biological, nuclear, and chemical.³²

Notes

³ Muammar Qadhafi, *Escape to Hell and Other Stories* (Montreal: Stanke, 1988), 170.

⁴ Ibid.

⁵ Craig R. Black, *Deterring Libya: The Strategic Culture of Muammar Qadhafi*. Counterproliferation Papers, Future Warfare Series No. 8 (Maxwell AFB AL: Air University Press, 2000), 17.

⁶ Ibid., 13.

⁷ Mansour O. El-Kikhia, *Libya's Qadhafi: The Politics of Contradiction* (Gainesville, FL: University Press of Florida, 1997).

⁸ Thomas C. Wiecele, *The Clandestine Building of Libya's Chemical Weapons Factory*. (Carbondale, Ill.: Southern Illinois University Press, 1992), 159.

⁹ Husayn Al-Kurdi, "Qadaffi vs. New World Order," *Toward Freedom Magazine*, February 1997, n.p., on-line, Internet, 25 November 2001, available from <http://www.geocities.com/CapitolHill/5260/kurdi2.html>.

¹⁰ Raymond Tanter, *Rogue Regimes: Terrorism and Proliferation* (New York: St. Martin's Griffin), 138-139.

¹¹ Ibid., 172.

¹² Robert Waller, "The Libyan Threat to the Mediterranean," *Jane's Intelligence Review*, May 1996, 226.

¹³ Michael Ledeen, "Part of the Problem," *National Review Online*, 8 October 2001, n.p., on-line, Internet, 12 February 2002, available from <http://www.nationalreview.com/contributors/ledeen100801.shtml>.

¹⁴ Sidney D. Drell, Abraham D. Sofaer, and George D. Wilson, ed., *The New Terror: Facing the Threat of Biological and Chemical Weapons* (Stanford, CA: Hoover Institution Press, 1999), 463.

¹⁵ Qadhafi, *Escape to Hell and Other Stories*, 54.

¹⁶ Dirk Vandewalle, ed., *Qadhafi's Libya, 1969-1994*. (New York: St. Martin's Press, 1995), 54.

Notes

¹⁷ Black, 15.

¹⁸ Robert Waller. *The Deterrence Series: Chemical/Biological Weapons and Deterrence Case Study #2: Libya*. (Alexandria, VA: Chemical and Biological Arms Control Institute, 1998), 7.

¹⁹ Ibid., 7.

²⁰ Ibid.

²¹ Col. Mu'ammar Al-Qadhafi, interviewed by author, "Why There is Veto on Oil Prices Only..." *The Milli Gazzette*, 15 January 2001, n.p., on-line, Internet, 25 November 2001, available from <http://www.milligazette.com/Archives/15012001/inter.htm>.

²² Ibid.

²³ Nicholas Berry, "The Self-Serving 'Rogue State' Doctrine," *Center for Defense Information Asia Forum*, 16 June 2001, n.p., on-line, Internet, 9 December 2001, available from <http://www.cdi.org/asia/fa061601.html>.

²⁴ Ibid.

²⁵ Ibid.

²⁶ Senate, Testimony before the Senate Foreign Relations Committee for Near Eastern and South Asian Affairs by Deputy Assistant Secretary of State for Near Eastern Affairs Ronald E. Neumann, 4 May 2000, n.p., on-line, Internet, 10 December 2001, available from <http://www.fas.org/news/libya/000504-libya-usia1.htm>.

²⁷ Senate Testimony (Neumann).

²⁸ Ibid.

²⁹ "Qaddafi's African Dream," *Economist*, 16-22 September 2000, n.p., on-line, Internet, 20 September 2000, available from <http://ebird.dtic.mil/Sep2000/s20000919dream.htm>.

³⁰ Ronald Neumann, "U.S. Policy Toward Libya," 30 November 1999, n.p., on-line, Internet, 10 December 2001, available from http://www.fas.org/news/libya/991130_neumann_libya.htm.

³¹ Black, 18.

³² El-Kikhia, 94-95.

Chapter 3

Libya's Weapons of Mass Destruction

Conventional weapons—enough to properly outfit a world-class military force dedicated to revolutionary efforts to unify the peoples of several nations in a common cause—are expensive and require a systematic modernization program. Unfortunately for Muammar Qadhafi, the billions of dollars he spent building his conventional land, sea, and air forces have never served him or Libya well, and he eventually lost faith in them. His loss of faith in these forces did not result in a wholesale re-evaluation of his dreams of power. Instead, it caused him to reconsider the means by which he could wield his power to protect himself from those he considered his state's enemies, and eventually realize his revolutionary visions.

The following chapter will examine the steps taken by Muammar Qadhafi to acquire and/or develop weapons of mass destruction for his use, as well as the current status of those weapons programs.

Biological Weapons

*American aircraft, cruise missiles, and even nuclear bombs will not be enough. These will be something that is very, very small and can only be seen by the microscope: the biological virus...American aircraft carriers and missiles will not be able to fight off these new things.*³³

—Muammar Qadhafi

According to Ken Alibek, a biological weapons expert from the former Soviet Union, nations engaged in nuclear and/or chemical weapons programs almost always add biological weapons (BW) to their inventories, especially when those states are firmly committed to taking all necessary steps to protect themselves from attack.³⁴ Libya is clearly interested in harnessing biological agents for potential use as weapons, and has reached out to several countries with the expertise and means for building a BW program. The former Soviet Union organized courses in genetic engineering and nuclear biology in conjunction with their own ambitious biological weapons program, and trained scientists from several “rogue” states, including Cuba, Iran, Iraq, and Libya.”³⁵ Evidence indicates the German firm Imhausen-Chemie provided research and development assistance for the Libyan program, housed at a facility in the town of Taminhint in south central Libya.³⁶ Likewise, intelligence hints that Qadhafi has received some help from Iraq in building his biological weapons program.³⁷

In spite of substantial technical and engineering help from several outside sources, Libya has made little real process in developing a viable indigenous biological weapons program. Experts believe the Libyan program has not yet proceeded beyond the research and development phase.³⁸ Though able to produce laboratory quantities of biological agents for their research program, the Libyans have not demonstrated an ability to produce sufficient quantities for weapons applications.³⁹

In spite of their lack of real progress on their own program, Libya has taken an active role in offering assistance to other countries seeking to build biological weapons capabilities. Libyan specialists have contacted other Arab countries and expressed interest in funding joint BW programs—including those with military applications—as

long as they conduct those programs somewhere other than on Libyan soil.⁴⁰ This is likely fueled by two considerations. First and foremost, Qadhafi may be attempting to leverage his allies to benefit his own program due to a realization that he has a limited ability to succeed alone. He may also be concerned about the political backlash he will suffer if he makes overt steps to aggressively expand Libya's BW program. Regardless, his unwillingness to completely abandon any hopes of developing biological weapons, and other weapons of mass destruction, means he is a potential threat.

Nuclear Weapons

Acquiring the ability to produce nuclear weapons independently of other nations is a much more difficult task than developing a biological weapons capability. In 1970, Qadhafi attempted to buy a nuclear weapon from the People's Republic of China. Unfortunately for him, China refused his request.⁴¹ Next, he helped Pakistan obtain Uranium from Nigeria in hopes of benefiting from their effort to enrich Uranium as part of their nuclear weapons program. The Pakistanis repaid Qadhafi by severing their ties with him before they finally succeeded in demonstrating their nuclear weapons capability.⁴² Since then, the Libyans have made little progress at independently establishing a viable nuclear weapons program. They have, however, received some outside help in nuclear research.

Following the relaxation of multilateral sanctions against Libya, the Russians agreed to provide Qadhafi's regime with a small nuclear reactor for their research facility at Tajura (Figure 1). To date, the Libyans have operated this reactor in a responsible manner and have operated the facility under the guidance of the International Atomic

Energy Agency.⁴³ Such oversight is necessary to ensure none of the nuclear technology transfers to potential military applications.



Figure 1: Libya’s Major Nuclear and Chemical Facilities Source: “Proliferation: Threat and Response” (1996)

Chemical Weapons

By far the most highly developed and productive of all Libya’s WMD programs, their chemical weapons (CW) program stands as a testament to Muammar Qadhafi’s determination to elevate Libya’s status through the procurement of WMD. When the international community questioned his need for a CW program, he insisted that Libya had a right to pursue its own chemical weapons program as a safeguard against its enemies. Qadhafi pointed to the fact that the United States maintained large stockpiles of

chemical weapons, and he was convinced the Israelis were benefiting from the U.S. program.⁴⁴ With that justification, he took steps to obtain chemical weapons for Libya. His most notable activities involved two major chemical weapons production facilities.

The first major attempt by the Libyans to produce a large-scale chemical weapons facility was at their plant in Rabta. (Figure 1) In 1984, the Libyans started construction on what was at the time one of the largest chemical production compounds in the world. The facility includes ten individual plants and numerous underground facilities, and conceals approximately 100 large storage tanks buried underground within the compound. It appears likely that the Libyans received immense cooperation from Japan, Denmark, and Italy in the construction of the Rabta facility.⁴⁵ In addition, Libya hired chemical experts from Austria, Denmark, Hong Kong, Japan, Thailand, and West Germany to operate the facility once it opened.⁴⁶ Evidence indicates the Libyans produced approximately 100 tons of blister and nerve agent at the Rabta facility during the 1980s.⁴⁷

Events in the very early 1990s made Muammar Qadhafi rethink his strategy for producing chemical weapons. He witnessed the solidarity of the immense multinational coalition aligned against his Arab brother Saddam Hussein during the Persian Gulf War. He was profoundly influenced by the destruction brought upon the Iraqis during the short conflict, and could not help but note the effects of precision weapons with the ability to penetrate hardened facilities and buried bunkers. His vast chemical weapons program was now completely vulnerable to modern air power.⁴⁸ To preserve his foothold in the chemical weapons production business, Qadhafi dispersed his chemical manufacturing units from Rabta to several alternate sites. These sites included the Jallo Barracks near

Jallo City, a secret location at a farm south of Souk Al-Alilika in Sabrata, and eventually at Tarhunah, the site of his most ambitious chemical facility.⁴⁹

Qadhafi's boldest step was to order the construction of a hardened chemical production facility deep within a mountainside near the town of Tarhunah, 60 kilometers southeast of Tripoli.⁵⁰ (Figure 1) The project was an enormous undertaking, and intelligence sources quickly spotted the construction efforts. Experts analyzed the available data and determined the Libyans were in the process of constructing an immense underground chemical weapons facility that was impervious to conventional military weapons, including precision gravity bombs and cruise missiles. The United States immediately took the lead in focusing intense international attention on the site, hoping to force the Libyans to cease construction. The Clinton administration announced its willingness to attack Tarhunah "with the whole range of American weapons" if Qadhafi did not halt construction on what was considered the largest chemical weapons production facility in the world.⁵¹ Qadhafi insisted the site was part of his "Great Man-Made River" (GMMR) project, a \$27 billion effort to transport fresh water from inland to the heavily populated areas along Libya's northern coast.⁵² However, intense diplomatic pressure came to bear, including a face-to-face visit from Egyptian President Hosni Mubarak.

After a personal visit to the Tarhunah site and a period of serious negotiation, Mubarak convinced Qadhafi that the international community would not permit him to complete the project. In late 1996, U.S. intelligence sources confirmed that the site "appeared dormant."⁵³ Unfortunately, because of the array of underground tunnels in the complex, it is possible for the Libyans to hide signs of continued construction out of sight

of observers. Even if the site is dormant, it is possible the complex is now being used as a secure storage location for Libya's chemical weapons stockpile.

Now that he most likely possesses weapons-grade chemical agents, Qadhafi poses a threat as a possible supplier of chemical weapons to other parties. These chemical weapons could find their way into the hands of state actors willing to pay the price. Sources indicate Qadhafi may have already sold some of his chemical products to his friends in Sierra Leone, Liberia, the Ivory Coast, Sudan, Somalia, and other African nations.⁵⁴ Non-state actors such as terrorist organizations could also acquire these weapons, either through direct trade with Libya or through a third party. Another potential side effect—neighboring nations fearing Qadhafi's use of these weapons could now find added inspiration to acquire their own chemical weapons as a response to the Libyan threat. If he ever does plan to use his chemical weapons, Muammar Qadhafi will have to continue to develop his weapons delivery systems.

Notes

³³ Qadaffi, *The Milli Gazette*.

³⁴ Ken Alibek, *Biohazard* (New York: Dell Publishing, 1999), 277.

³⁵ Ibid., 275.

³⁶ El-Kikhia, 95.

³⁷ Joshua Sinai, "Qadhafi's Quest," *Near East Report*, 20 March 2000, Reprinted at the Jewish Virtual Library, n.p., on-line, Internet, 25 November 2001, available from http://www.us-israel.org/jsource/Threats_to_Israel/Qadhafi.html.

³⁸ *Chemical and Biological Weapons Site*, Center for Defense Information, 16 November 2000, n.p., on-line, Internet, 4 December 2001, available from <http://www.cdi.org/issues/cbw/Libya.html>.

³⁹ Ibid.

⁴⁰ *Chemical and Biological Weapons Nonproliferation Project*, The Henry L. Stimson Center, n.p., on-line, Internet, 4 December 2001, available from <http://www.stimson.org/cwc/bwprolif.htm>.

⁴¹ "Libya Has Trouble Building Most Deadly Weapons," *The Risk Report*, Volume 1 Number 10, December 1995, n.p. on-line, Internet, 4 December 2001, available from <http://www.wisconsinproject.org/countries/libya/trouble/html>.

⁴² "Libya Has Trouble Building Most Deadly Weapons," *The Risk Report*.

Notes

⁴³ *Weapons of Mass Destruction in the Middle East*, Center for Non-Proliferation Studies, Monterey Institute of International Studies, on-line, Internet, 3 December 2001, available from <http://www.cns.miiis.edu/research/wmdme/libya.htm>.

⁴⁴ Wiegele, 33.

⁴⁵ Ibid., 50.

⁴⁶ Ibid., 51.

⁴⁷ Chemical and Biological Weapons Website.

⁴⁸ Robert Waller, *The Deterrence Series: Chemical/Biological Weapons and Deterrence Case Study #2: Libya*, 5.

⁴⁹ "Libya's Qadhafi Seizes Opportunity to Move Out of Isolation While Expanding Radical Activities, Including CBW Development," *Defense and Foreign Affairs Daily*, 8 November 2001. n.p.

⁵⁰ Robert Waller, *The Deterrence Series: Chemical/Biological Weapons and Deterrence Case Study #2: Libya*, 5.

⁵¹ Gary W. Lane, *New Conventional Weapons: Reducing Reliance on Nuclear Response Toward Aggressors*, (Maxwell AFB, AL: Air University Press, 2001), 12.

⁵² El-Kikhia, 77.

⁵³ Robert Waller, *The Deterrence Series: Chemical/Biological Weapons and Deterrence Case Study #2: Libya*, 6.

⁵⁴ *Defense and Foreign Affairs Daily*, 8 November 2001.

Chapter 4

Libya's Weapons Delivery Systems

As ambitious as all WMD development programs may be, they will be of marginal value if Qadhafi has no reliable, effective means of delivering those weapons upon his enemies. Libya's potential methods for delivering these weapons include employment on his aircraft, artillery, and ballistic missiles.

Aircraft

Though in generally poor condition, Qadhafi's fighter and cargo aircraft are capable of delivering chemical or biological weapons. One avenue available to Qadhafi for expanding the potential of his air force is extending its combat range by incorporating an aerial refueling capability. In March 1990, the U.S. Department of Defense announced that Libya had successfully tested mid-air refueling with his MiG-23 fighters.⁵⁵ The Intec Technical Trade and Logistics Society of Vatterstetten has been identified as the general supplier for the equipment Qadhafi needs for converting some of his American-made C-130 aircraft into tanker platforms for his French-and Soviet-made fighters.⁵⁶ This is part of a continuing effort to perfect the process, and will allow Qadhafi to extend the threat posed by his air force well beyond his borders.

Artillery

Besides their fighter, bomber, and cargo aircraft, the Libyans have demonstrated the ability to weaponize their artillery. They have already used artillery to deliver chemical weapons against Chad, and have weaponized much of their CW stockpiles in the form of 155mm artillery shells.⁵⁷ Experts downplay this threat, however. Many feel Libya would be unable to bring their chemical-armed artillery into action against “any but the most unsophisticated opponents” given the state of their equipment, poor tactics, and the likelihood that almost any enemy would exercise air superiority over the battlefield.⁵⁸

The Greatest Threat—Libya’s Missiles

Libya’s missiles are likely the most capable of Qadhafi’s delivery systems, and have therefore received the greatest emphasis in his modernization programs. Qadhafi proved his willingness to use these weapons against American forces in the mid-1980s. In retaliation for the “El Dorado Canyon” air attack against targets in Tripoli and Benghazi, Qadhafi fired two SCUD rockets at a U.S. facility on the island of Lampedusa. Though the missiles fell short of their targets and achieved no military objective, their employment indicated Qadhafi’s willingness to use his ballistic missiles to target even his largest and most powerful enemies.⁵⁹

At this time, Libya’s ballistic missile inventory includes the North Korean SCUD-B, SCUD-C, and most recently the No Dong missile, with its 800-mile range. The SCUD-C can propel a 1,105-pound payload over a distance of 550 kilometers. In addition, the Libyans have the Russian-made SS-21 “Scarab,” and are attempting to develop the “Al-Fatah” SCUD rocket with its 950-kilometer range.⁶⁰ A missile with this range will allow Libya to directly target Israel from within its own borders.⁶¹ The Libyans also have the

Frog-7, a short-range ballistic missile, but its 70-kilometer range greatly limits its value as a WMD delivery system.⁶²

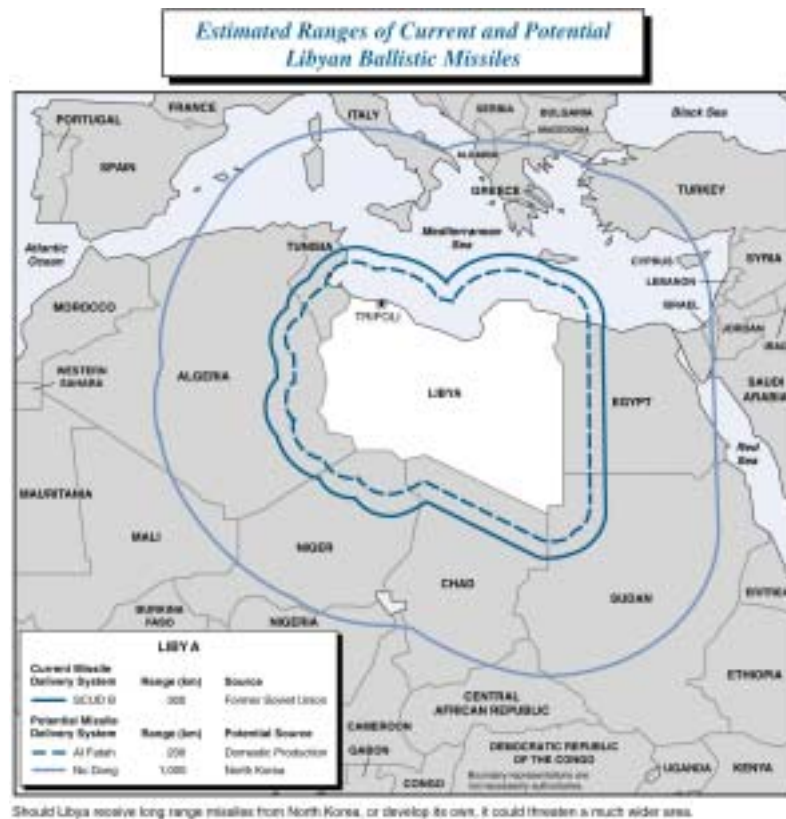


Figure 2: Libyan Ballistic Missile Ranges (Estimated) Source: “Proliferation: Threat and Response” (1997)

The Libyans tried for years to obtain North Korean No Dong missiles. In the summer of 1999, Indian customs officials seized a North Korean ship carrying concealed No Dong components, including guidance and navigation systems. The Indians initially suspected the ship was bound for their enemies in Pakistan, but intelligence sources later determined the ship was en route to Libya via Malta.⁶³ Qadhafi’s persistence paid off, however, as it appears the Libyans have finally succeeded in obtaining the highly capable Korean missiles. According to a report in *Defense and Foreign Affairs Daily*, the Libyans received their first shipment of 36 No Dong missiles, some launchers, and as

many as 11 technical experts in August of 2000. The first of those missiles and their launchers were deployed along the Mediterranean coast the following month.⁶⁴ The chart in Figure 2 illustrates the significance of this development. Libyan No Dong missiles provide Muammar Qadhafi a means for holding Israeli targets—as well as targets in Southern Europe and all of his immediate African neighbors—at risk. The current agreement with North Korea will provide Libya a total of 50 missile systems, launchers, and the required storage and maintenance infrastructure. The deal also includes a program for training the Libyans in all aspects of their new missile technology.⁶⁵ Finally, Libya appears interested in the Chinese M-9 missile, though its 600-km range is inferior to that of the No-Dong.⁶⁶

With a solid program for creating chemical weapons and some measurable capability for delivering them, Libya is definitely a threat to neighboring states. If he chooses to export his weapons abroad, his regime could prove to be a threat to any of his enemies worldwide. The remainder of this paper will address methods for deterring his use of those weapons or assisting in their proliferation.

Notes

⁵⁵ Wiegele, 117.

⁵⁶ Ibid., 36.

⁵⁷ Robert Waller, *The Deterrence Series: Chemical/Biological Weapons and Deterrence Case Study #2: Libya*, 8.

⁵⁸ Drell, 28.

⁵⁹ Joshua Sinai, “The Future of Libya’s Weapons of Mass Destruction Program,” *Missile News*, August 1998, n.p., on-line, Internet, 4 December 2001, available from <http://www.cdiss.org/col99apr27.htm>.

⁶⁰ Ibid.

⁶¹ Joshua Sinai, “Qadhafi’s Quest.”

⁶² Robert Waller, *The Deterrence Series: Chemical/Biological Weapons and Deterrence Case Study #2: Libya*, 8.

⁶³ *Defense and Foreign Affairs Daily*, 8 November 2001.

⁶⁴ Ibid.

Notes

⁶⁵ Con Coughlin, "Missile Deal Puts Israel in Gaddafi Sights, *London Sunday Telegraph*, 24 September 2000, 1, on-line, Internet, 26 September 2000, available from <http://ebird.dtic.mil/sep2000/e20000925missiles.html>.

⁶⁶ Kathleen C. Bailey, *Doomsday Weapons in the Hands of Many: The Arms Control Challenge of the '90s*, (Chicago: University of Illinois Press, 1991), 120.

Chapter 5

Deterring Muammar Qadhafi

No one knows for sure if Muammar Qadhafi will ever order the employment of his weapons of mass destruction or offer them to other “customers.” Therefore, it is imperative that we explore and understand a variety of means for denying him the opportunity and ability to do so. There are two primary tools available for taking these weapons out of his hands—deterrence and force.

Since Operation ENDURING FREEDOM commenced in October 2001, the United States under President George W. Bush has clearly shown how it will react to direct attacks upon its homeland. The utter elimination of the Al Qaeda terrorist network is just a hint of what a determined superpower is willing to do in order to deliver justice to those who would attack its people at home or abroad. Even a “rogue” leader must recognize the unbearable price he or she will most certainly pay following a WMD attack. Any U.S. President would in all likelihood be forced to retaliate with any or all weapons in the American arsenal should a nation either directly or indirectly employ WMD against American interests.⁶⁷ It appears likely that Saddam Hussein took heed of President George H. W. Bush’s warnings not to use chemical weapons during the Persian Gulf War.⁶⁸ If true, even this seemingly irrational dictator recognized the insanity of crossing that boundary.

Oil: Qadhafi's Achilles Heel?

In his composition titled “Deterring Libya: The Strategic Culture of Muammar Qadhafi,” Navy Commander Craig Black insists the only way to deter someone like Qadhafi is to put something extremely dear to him at risk. Because of their overall weakened condition, his armed forces themselves make a poor target, but denying him the ability to profit from his oil industry on the open market is another story.⁶⁹ Oil pays for his military and security forces, placates his political opponents, and keeps himself and his friends living at the standard to which they have become accustomed over the years.⁷⁰ Only multilateral sanctions imposed by the United Nations—including restrictions on his ability to sell oil abroad—eventually coerced Qadhafi to adopt a less antagonistic stance toward his neighbors and sworn enemies. More importantly, because the United Nations imposed these sanctions, Qadhafi could not blame the United States and Israel alone for the tremendous negative effects the sanctions had on his power base.⁷¹ This kind of worldwide political pressure has succeeded where other methods of influencing Qadhafi's behavior have failed.

Rogue States

In an effort to solve the problem caused by all “rogue states,” Nicholas Berry from the Center for Defense Information proposed six options for dealing with such regimes. He recommends using any or all of the following to force such leaders to fall into line with other states: appeasement; step-by-step gestures; deference; promote elections; subversion; and finally, war.

In spite of the negative connotations historically associated with a policy of appeasement, Berry suggests this tactic has recently proven successful. He feels

appeasement succeeded in bringing about the former Soviet Union's reduction of nuclear weapons in conjunction with the Intermediate-Range Nuclear Forces Treaty. Berry claims appeasement has also worked in our efforts to reduce the nuclear threat posed by North Korea.⁷² However, appeasement was merely a small part of the West's overall strategy of reducing the threats posed by the Soviet Union and North Korea, and such one-sided concessions are unlikely to prove successful with Libya.

Berry's next proposal is for step-by-step gestures of goodwill and cooperation between the belligerent parties. These inducements for improved relations have also proven successful lately, specifically between the U.S. and China, Vietnam, and possibly even Iran.⁷³ Given the correct signals from either the Qadhafi regime or a successor regime, the United Nations could agree to provide some incremental benefits to Libya in exchange for clear and irrefutable signs that Libya is willing to relinquish some measure of its ability to produce, store, export, or employ WMD. Open and unrestricted verification of these actions would be a prerequisite for any further steps, and should lead the West to offer subsequent inducements in exchange for further changes in behavior.

The tactic of deference is another viable means for getting Libya to change its behavior. In this case, Qadhafi and/or others in positions of influence must recognize a critical need to end their country's previous course and make concrete changes. Post-Castro Cuba and post-Qadhafi Libya are perfect examples of this option.⁷⁴ When either of these leaders are no longer in power, the U.N. or the United States could make overtures to parties within the countries to offer assistance when they are ready to ask for it. Promoting elections in these countries is the next logical step. The United States and

its allies have already succeeded in bringing about democratic governments in Nicaragua and Yugoslavia by encouraging and assisting the populations with their free elections.⁷⁵

If unable to encourage the populace to seek a freely elected government, we could either directly or indirectly subvert the existing regime. It is clearly within the best interests of the United States to use this method to topple “highly dangerous, tyrannically led rogue states apparently willing and able to use weapons of mass destruction against the U.S. and its allies.”⁷⁶ A coalition formed between Islamic extremists and the Libyan military would pose the most serious threat to Qadhafi’s regime; however, due to the implications of allowing Libya’s WMD to fall into the hands of such a group, supporting this coalition would not be prudent.⁷⁷ Berry points out further negatives associated with subversion, including the legacy of resentment it can leave with the population and the fact that this tactic robs them of an opportunity to act on their own to form a government of their choosing.⁷⁸

Finally, the option of going to war to prevent Qadhafi from using his WMD remains viable. The U.S. has just eliminated an “uncooperative” government and state sponsor of terrorism in Afghanistan, but has also used force recently in Grenada (1983) and Panama (1989).⁷⁹ Qadhafi must understand by now that any use of his WMD against the U.S. or its interests abroad would be a fatal mistake. According to Berry, “...Every leader of a rogue state knows he would sign his death warrant if he attacked or threatened an attack on the U.S. And every one of his military personnel who would prepare such a venture would know his survival could be counted in hours.”⁸⁰

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⁶⁷ Nicholas Berry, “The Self-Serving ‘Rogue State’ Doctrine.

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⁶⁸ Stephen J. Cimbala, ed., *Deterrence and Nuclear Proliferation in the Twenty-First Century*, (Westport, CT: Praeger Publishers, 2001), 30.

⁶⁹ Black, 18.

⁷⁰ Ibid.

⁷¹ Ibid., 19.

⁷² Nicholas Berry, "How to 'De-Rogue' Rogue States," *Center for Defense Information Asia Forum*, 15 June 2001, n.p., on-line, Internet, 9 December 2001, available from <http://www.cdi.org/asia/fa061501.html>.

⁷³ Ibid.

⁷⁴ Ibid.

⁷⁵ Ibid.

⁷⁶ Ibid.

⁷⁷ Black, 18.

⁷⁸ Nicholas Berry, "How to 'De-Rogue' Rogue States."

⁷⁹ Ibid.

⁸⁰ Ibid.

Chapter 6

The Future of U.S. – Libya Relations

A meaningful, positive change in U.S. – Libya relations would have significant implications for both countries. Renewed diplomatic relations between these two rivals could result in economic, political, and military windfalls for both countries. In addition, the positive effects of this new alliance would most likely reach many countries around the world.

Reasons for Qadhafi to Reconcile

Rational or not, Qadhafi must recognize that his dreams of Libyan domination of the Middle East will never come to fruition. Likewise, he must realize that he can no longer spend his nation's economy the way he did in the early 1970s. Things have changed for the worse for Muammar Qadhafi and Libya since then, and unless Qadhafi senses a real need to take Libya in a different direction, there will never be progress. He should not have to look hard for reasons to change. A weak economy, failed agricultural system, and a lack of support for his shifting ideologies at home are just three good reasons for Qadhafi to change his strategy.

Libya's Oil Industry. Historically, oil production has been the driving force behind modern Libya's economy. Following the discovery of Libya's significant oil reserves in 1959, the once poor Libya quickly developed a new wealth bolstered by one of the

world's leading per capita GDPs.⁸¹ This reliance on a single source of economic stimulus resulted in Libya's riding a series of economic ups and downs for decades. The economy has suffered from a combination of unstable oil prices, corruption in the oil industry and government, and economic sanctions. Libya's apparent support for terrorists eventually brought United Nations into action. In January 1992, the U.N. Security Council approved Resolution 731 demanding that Libya hand over the suspects in the bombing of Pan Am Flight 103 over Lockerbie, Scotland. This resolution also required the Libyans to cooperate with the investigation, compensate the victims' families, and cease all support for terrorist activities around the world. Libya's failure to respond to UNSCR 731 led to at least two additional resolutions, and U.N. sanctions designed to force the Libyans to cooperate.⁸²

After the United Nations lifted its economic sanctions in 1999, Qadhafi regained a portion of his lost oil business, but quickly focused the profits on his decaying military machinery.⁸³ The Libyan oil production level has returned to a rate of approximately 1.4 million barrels per day, far lower than the 2.5 million barrels per day produced before the 1969 coup.⁸⁴ This first step in recovering an incredibly important source of income should provide some incentive for Qadhafi to take additional steps to improve his nation's economy.

If he hopes to rebuild his economy on the strength of his once powerful oil industry, Colonel Qadhafi will need help. One source estimates the cost to rebuild the Libyan oil industry to the level required to achieve its previous capacity of 2.5 million barrels per day at approximately \$70 billion.⁸⁵ Though they have expressed an interest in subsidizing some of the costs to rebuild Libya's oil industry, French and Italian investors

are unlikely to provide that level of assistance. Instead, they are actively pursuing a plan to design and build hydrocarbon treatment plants on the Libyan coast for an investment of less than \$5 billion.⁸⁶ If Muammar Qadhafi is serious about using his oil industry to develop an economy capable of supporting his strategic goals for Libya, he will need to form solid relations with the United States Government and encourage American oil companies to return to their abandoned facilities in his country.

Agriculture. Oil has not been Qadhafi's only concern over the years. Behind oil, agriculture is Libya's second largest industry, but it is far from sufficient for meeting Libya's demands. The agriculture industry is only capable of meeting approximately 25 percent of the nation's food requirements. A major obstacle to Libya's ability to become self sufficient in food production is a severe shortage of water in the more populated regions.⁸⁷ Hence, a realistic need for Qadhafi's so-called "Great Man-Made River" project. The GMMR was advertised as a means for conveying many millions of cubic meters of water from ancient artesian wells in Libya's southern desert to the major population centers near the Mediterranean coast.⁸⁸ The Libyans have invested billions of dollars on the GMMR, but today the pipes show signs of severe corrosion, and water meant for Libya's population centers is leaking into the sand.⁸⁹

These signals provide an insight into the Libyan economy's status following years of Muammar Qadhafi's leadership and the sanctions levied against his government by the United States and the United Nations. The combined results of all these factors are undeniable: by the mid-1990s, the Libyan economy was suffering from the effects of 50% inflation, 30% unemployment nation-wide, and a general shortage of consumer goods.⁹⁰

Qadhafi's Changing Focus. Finally, Libya suffers from the lack of a clear sense of direction. Colonel Qadhafi's years in power have been marked by a series of shifts in ideology, each trying to push Libya in a different direction. The shifts have been embarrassing for Libya as a whole and have left the Libyan population both disinterested in Qadhafi's various crusades and unwilling to support him politically.

At the very beginning of his dictatorship, Qadhafi viewed himself as a leading proponent of Nasser's Pan-Arabism. He appealed to the other Arab states to abolish their borders with each other in favor of one united Arab State. Not surprisingly, Qadhafi failed in this first ambitious quest to reshape the Middle East.⁹¹ Beginning in the late 1980s, Qadhafi tried to portray himself as the "head of revolutionary Islam."⁹² Qadhafi likely took a radical approach to his religion because he viewed Islamic fundamentalism as the foundation for many of his staunchest opponents.⁹³ Again, Qadhafi failed to rally the support of that movement, so he shifted to yet another campaign. Since 1998, Qadhafi has turned his attention more toward Pan-Africanism and African unity. To establish himself as the most influential proponent of this new movement, Qadhafi unilaterally intervened to resolve disputes involving several of his African neighbors, including the Congo, Sudan, and Sierra Leone.⁹⁴ Qadhafi has even appeared before Libyan national television displaying a map of Africa sans national borders, painted entirely in green (the color of the Libyan flag).⁹⁵ In addition to gaining no support among the other African leaders, Qadhafi's efforts to unify Africa are causing turmoil and discontent among his own people. Libya's open borders with neighboring countries have resulted in a flood of immigrants which has turned Libyans into "...a minority in their own capital."⁹⁶

Libya—and the Libyan people—have not fared well under the leadership of Muammar Qadhafi. They have suffered through economic and political backlash resulting from his mismanagement of the country's resources and foreign policies. Domestically, the Libyans have been riding a rudderless ship, often changing directions at the whims of an unpredictable captain.

Benefits of Reconciliation

Economically, both countries would benefit from resumed oil trade. Oil is Libya's top income source, and four U.S. oil companies were forced to abandon profitable operations in Libya when relations between the two countries dissolved. Though several European oil companies have made bids on those facilities, the Libyan government so far has refused to sell them off. All of the American companies are eager to return to their commercial properties in Tripoli.⁹⁷ In addition to the economic benefits to these American corporations and the Libyan economy, having an additional stable, reliable source of oil could prove invaluable to America and her allies worldwide.

Both countries could benefit politically as well. By resuming normal relations with Libya, the United States could gain credibility in its efforts to disprove claims that its global war on terror is merely a war against Islam. Only two of the seven states currently listed as state sponsors of terror—North Korea and Cuba—are not Islamic.⁹⁸ Similarly, the United States could demonstrate to the remaining states that their inclusion on this list is not necessarily permanent. Because the United States is exploring possible reconciliation with Iran and Syria, both Islamic nations currently considered state sponsors of terror, this positive step with Libya could demonstrate America's sincerity in resuming normal relations with former adversaries.⁹⁹ In return, Libya would gain

recognition as the first nation in more than a decade to graduate from the list of state sponsors of terror. This new “friendly nation” would very likely benefit from a subsequent windfall of new political relationships with countries formerly unwilling to extend a hand of friendship with Libya as a rogue state.¹⁰⁰

Militarily, the United States and its allies would benefit from the emergence of a new partner in an otherwise unstable region of the globe, as well as diminished threats from Libya’s conventional and unconventional weapons. Should the Kingdom of Saudi Arabia, Kuwait, or any of the other nations in the Middle East who merely tolerate U.S. presence revoke our basing privileges, our ability to reestablish a military presence at the former Wheelus Air Force Base in Libya would serve two important purposes—it would help the U.S. ease tensions with our allies in the Middle East and preserve a potential base of operations in the theater. A new alliance with the United States and the other Western nations would allow the Libyan armed forces to take advantage of superior American and European technology, and many willing arms contractors with modern conventional war fighting merchandise to sell. The United States might even consider providing some kind of military aid package to a newly allied Libya, though by helping rebuild the Libyan oil-producing infrastructure and opening the industry to greater sales worldwide sales, the U.S. could achieve the same end. All of these economic, political, and military benefits to both countries have been predicated on signs that Muammar Qadhafi has changed his ways and is serious about forging new relations with the West.

Reconciliation: America’s Requirements

Operation EL DORADO CANYON clearly frightened Qadhafi and taught him that he was in fact completely vulnerable to his enemies in spite of his visions of invincibility.

Following Qadhafi's apparent change of behavior, hope grew that relations could change between the two countries. Since then, The United States has been looking for solid evidence that Colonel Qadhafi has changed his ways and is finally interested in improving relations.

The first positive signals did not come until 5 April 1999, when Qadhafi finally agreed to hand over two Libyans suspected of carrying out the bombing of Pan American Airways Flight 103.¹⁰¹ Almost immediately, the United Nations suspended its 1992 sanctions against Libya.¹⁰² Just four days later, the U.S. – Libya Dialogue Group, a non-profit organization with an eye toward resuming economic ties, held its first meeting in Maastricht, the Netherlands, with the goal of showing "...people in both countries, away from government, that people can communicate, work with each other." That meeting led to another in August 1999 on Malta.¹⁰³

The United States Government responded to Colonel Qadhafi's actions by sending Martin Indyk, then Assistant Secretary of State for Middle Eastern Affairs, and Bruce Riedel, the White House's top Middle East staffer, to meet with Moussa Koussa, the head of the Libyan External Security Organization (ESO), for the first of several official U.S. – Libya meetings to be held in England and Switzerland.¹⁰⁴ The goal of these meetings was to determine if the United States and Libya were finally making progress toward removing the last major barriers to normalization of relations between the two countries.¹⁰⁵

Seeing these meetings as an opportunity to reach a landmark agreement with the Libyans, the Clinton Administration States held a series of meetings to determine what additional steps Colonel Qadhafi would have to take to prove Libya was truly no longer a

refugee for state-sponsored terrorism. U.S. officials agreed that Libya had to take responsibility for the Pan Am terrorist bombing and compensate the families of the victims. The United Nations agreed and made the same demands.¹⁰⁶ These requirements are unambiguous, but because of the global war on terror and America's focus on defeating a new kind of state enemy, the United States could conceivably fall victim to political expediency and agree to a compromise with Qadhafi in hopes of resolving the Libya issue. There are indications Qadhafi is anticipating that very reaction.¹⁰⁷ Fortunately, President George W. Bush has not taken the easy path to peace with Libya.

Since taking office in January 2001, the Bush Administration has not sent the overly optimistic signals Qadhafi has been hoping for. In October 2001, William Burns, Assistant Secretary of State for the Middle East, addressed a Congressional committee and insisted "...there are no shortcuts around Libya...accepting responsibility for what happened and also for paying appropriate compensation" for the bombing of Pan Am Flight 103.¹⁰⁸ Though he did not include Libya among the nations that constitute the "Axis of Evil" during his 2002 State of the Union address, the president specifically cited sponsoring terror and acquiring weapons of mass destruction as intolerable behavior.¹⁰⁹ In doing so, he gave at least implied approval to the resumption of diplomatic pressure and continued unilateral sanctions against Colonel Qadhafi and the Libyan government.¹¹⁰ Most significantly, a senior administration official announced that President Bush has reversed a long-standing U.S. policy prohibiting the use of nuclear weapons against non-nuclear states. This dramatic policy reversal signals the president's willingness to consider nuclear strikes against critical targets considered otherwise impervious to conventional weapons—such as Libya's suspected chemical weapons

factory near Tarhunah.¹¹¹ (See Appendix A). The United States has clearly outlined what it expects from Libya in exchange for normalized relations. The next step belongs to Colonel Qadhafi.

The Libyan Response

Sadly, in spite of initial optimism about an impending change in U.S. – Libya relations, Colonel Qadhafi’s response to American demands—regarding both the Pan Am Flight 103 terror bombing and his pursuit of weapons of mass destruction—has been uncertain and inconsistent. In January 2002, Qadhafi reportedly rejected the idea of formally accepting responsibility for the Pan Am Flight 103 bombing. He also insisted he would not pay any compensation to the families of the victims. Both actions are clearly mandatory steps before the United States will consider further reconciliation talks.

Another setback to hopes of reconciliation involves the dictator’s response to the September 11th terror attacks against the United States and the current global war on terror. Colonel Qadhafi overtly condemned the four hijackings and the attacks on the twin towers of the World Trade Center and the Pentagon, calling them “horrifying, destructive.”¹¹² Privately, however, his reaction was different. Qadhafi reportedly told a meeting of delegates to the Organization of Islamic Conference Summit in October 2001 that he considered Usama bin Laden “a true hero” for his attacks. He also belittled the rest of the Muslim world for not having done something sooner.¹¹³ While he has outwardly feigned support for the war on terror, his aims have proven to be more self-serving than helpful to the coalition of countries engaged in the war. The Libyans offered to supply intelligence data on radical Islamic organizations, but carefully targeted only

those groups that oppose Qadhafi himself.¹¹⁴ Most disturbing, however, are indications that Qadhafi has not abandoned any of his efforts to obtain weapons of mass destruction.

There is a flood of information that indicates Muammar Qadhafi is taking advantage of the coalition's preoccupation with the war against terrorism to pursue his own goals of achieving a strategic advantage over the other nations in the region.¹¹⁵ The Central Intelligence Agency (CIA) reported in January 2002 that Libya's biological and chemical weapons development programs are still underway. The report further states that Qadhafi is actively seeking long-range ballistic missiles "...to increase the number of U.S. and NATO targets [he] can hold at risk."¹¹⁶ In spite of his words, there is little if any evidence to indicate Muammar Qadhafi is seriously interested in forging a peaceful relationship with the U.S. or its Western allies. The key to a new relationship therefore lies on the man who follows Qadhafi as the Libyan ruler.

Qadhafi's Future?

According to an article published by *Defense and Foreign Affairs Daily*, a change of Libyan leadership appears to be on the horizon. Concerns about Colonel Qadhafi's failing health are growing, and could signal a change of leadership within the next two years.¹¹⁷

Several signs point to impending change in Libya. Key Libyan officials appear to be posturing themselves for positions in a post-Qadhafi Libya, including many who are sponsoring Qadhafi's eldest son, Saif al-Islam al-Qadhafi, for the top leadership position.¹¹⁸ Many of Libya's neighbors, including Italy, France, and Saudi Arabia, have already expressed an interest in influencing the choice of successor. In addition, a major rift has developed between the elder Qadhafi and one of his most loyal deputies,

Abdullah Senussi. Senussi, head of strategic intelligence in Libya, has long been at odds with members of Qadhafi's family—though he himself is married to one of the dictator's sisters-in-law.¹¹⁹ This rift between Qadhafi and Senussi has apparently been fueled by Senussi's rivalries with other officials, including security chief Moussa Koussa, who has been envious of Senussi's close relationship with the dictator.¹²⁰ Finally, discrete signals from the United States and the Kingdom of Saudi Arabia hint at a possible change of leadership.

Previously mentioned talks between Libyan and American officials designed to facilitate an eventual reconciliation appear to have stalled. Likewise, the observers note a “de facto and discrete withdrawal of support for Qadhafi” by the Saudi Government.¹²¹ According to a *Defense and Foreign Affairs Daily* article, the Saudis recognize that normalized relations between the United States and Libya could provide the U.S. with additional military bases in the region from which to operate. The Saudis quietly hope this change of events will set the stage for a possible withdrawal of American troops from bases in Saudi Arabia—without any further confrontations between the two countries.¹²²

This chapter has discussed the variety of reasons why it is in Muammar Qadhafi's best interest to actively pursue renewed positive relations with the United States, along with reasons why the benefits would extend to other countries around the world. The United States laid down some clear requirements for a new cooperative agreement between Libya and the U.S., but Qadhafi has so far chosen to ignore some of them. Finally, the section examined some factors that could limit Muammar Qadhafi's control over the Libyan Government. The remainder of the paper will discuss some general

recommendations for further American political, military, and economic responses to the Libyan issue.

Notes

⁸¹ U.S. Department of State Bureau of Public Affairs.

⁸² Ibid.

⁸³ The International Institute for Strategic Studies, *Libya's Armed Forces: Prospects for Arms Procurement*, December 2000, n.p., on-line, Internet, available from <http://www.iiss.org/stratcom/sc.asp?610li>.

⁸⁴ "Major Changes Continue to Move Libya Into the Forefront of Strategic Focus," *Defense and Foreign Affairs Daily*, 4 February 2002, n.p.

⁸⁵ Ibid.

⁸⁶ Ibid.

⁸⁷ U.S. Department of State Bureau of Public Affairs.

⁸⁸ Geoffrey L. Simons, *Libya: The Struggle for Survival* (New York: St. Martin's Press), 1993.

⁸⁹ *Economist*.

⁹⁰ Robert S. Greenberger, "Sept. 11 Girds Gadhafi to Buckle Down in His Work to Get Off U.S. Terror List," *Wall Street Journal*, 14 Jan 2002, 1.

⁹¹ "Gadhafi Urges Africans to Defy Border Restriction," *Fox News Online*, 2 February 2002, n.p., on-line, Internet, 3 February 2002, available from <http://foxnews.com/story/0,2933,44629,00.html>.

⁹² *Economist*.

⁹³ U.S. Department of State Bureau of Public Affairs.

⁹⁴ Greenberger.

⁹⁵ *Fox News Online*.

⁹⁶ *Economist*.

⁹⁷ Greenberger.

⁹⁸ Ibid.

⁹⁹ Ibid.

¹⁰⁰ Ibid.

¹⁰¹ Ibid.

¹⁰² Ibid.

¹⁰³ Ibid.

¹⁰⁴ Ibid.

¹⁰⁵ *Defense and Foreign Affairs Daily*, 8 November 2001.

¹⁰⁶ Greenberger.

¹⁰⁷ *Defense and Foreign Affairs Daily*, 8 November 2001.

¹⁰⁸ Greenberger.

¹⁰⁹ Office of the Press Secretary, "President Delivers State of the Union Address," 29 January 2002.

¹¹⁰ *Defense and Foreign Affairs Daily*, 4 February 2002.

Notes

¹¹¹ Nicholas Kralev, "U.S. Drops Pledge on Nukes," *Washington Times*, 22 February 2002, 1, on-line, internet, 22 February 2002, available from <http://ebird.dtic.mil/Feb2002/e20020222usdrops.htm>.

¹¹² Greenberger.

¹¹³ *Defense and Foreign Affairs Daily*, 8 November 2001.

¹¹⁴ Ibid.

¹¹⁵ Ibid.

¹¹⁶ Greenberger.

¹¹⁷ *Defense and Foreign Affairs Daily*, 4 February 2002.

¹¹⁸ Ibid.

¹¹⁹ Ibid.

¹²⁰ Ibid.

¹²¹ Ibid.

¹²² Ibid.

Chapter 7

Recommendations

It is too soon to predict precisely what the future will bring to U.S. – Libya relations. Nevertheless, it is not too soon to review historical trends and examine options for dealing with Libya in hopes of forging a peaceful future for the two countries. The following section will offer some thoughts on Muammar Qadhafi's real plans for the future as well as some potential American responses, including continued counterforce technology development, zero tolerance of WMD proliferation, and persistent efforts to force Muammar Qadhafi's compliance with international demands.

In spite of the signals Muammar Qadhafi has been sending about his desire to change his ways, history indicates that his only lasting concern is his status as Libya's head of state. He appears to have cut ties with the terrorist organizations who used to have refuge within Libya's borders, yet he remains unwilling to accept responsibility for past terrorist activities tied to his regime. We cannot be certain that he has severed all ties with those terrorist organizations until he takes bold steps to prove otherwise. Similarly, we cannot be completely certain that he has actually abandoned his programs to develop weapons of mass destruction until he opens those facilities to international weapons inspectors.

Advanced Counterforce Technology. As a preventive and deterrent measure, the United States needs to continue to explore technologies related to precise conventional

weapons—and nuclear weapons if necessary—capable of penetrating hardened and deeply buried facilities. (See Appendix B) The current trend for hiding and protecting WMD research, development, and production facilities appears to be heading in this direction. Continued research into agent defeat capabilities will be required to negate the effects of attacks on biological weapons production and storage facilities. Making these facilities vulnerable to attack will serve two grand purposes: the United States and our allies will be able to eliminate these facilities at will, and individuals hoping to maintain WMD capabilities will have to expend an ever-increasing amount of their resources to counter emerging counterforce technologies. Assuming this approach led at least partly to the economic collapse of the Soviet Union, it could have additional applications against smaller governments as well.

Zero Tolerance Policy and Preemption. With these counterforce aims in mind, the United States needs to lead the rest of the world in aggressively demonstrating a zero tolerance policy toward the development and proliferation of weapons of mass destruction, especially chemical and biological weapons. This policy must be backed by an unquestioned willingness to employ whatever means necessary to systematically eliminate any of these facilities that emerge. President Bush has publicly highlighted the nations of Iran, Iraq, and North Korea as state actors who could threaten the United States or our allies with weapons of mass destruction.¹²³ Pre-emptive strikes against known WMD facilities, similar to the Israeli strike against the Iraqi Osiraq nuclear facility¹²⁴, must be executed whenever irrefutable evidence comes to light that a valid target exists. The danger does not end at a nation's ability to produce those weapons or use them against their enemies. An even greater danger lies in the prospect that these or any other

nations might make WMD available to non-state actors. It is imperative that the United States and other nations form a solid agreement that completely isolates and sanctions any nation known to provide WMD to non-state actors or to other states. Proliferation of these weapons serves no good purpose, so stopping the problem at the source must be an unmistakable priority.

Consistent Political Pressure. Muammar Qadhafi's days in power may in fact be limited due to his failing health. He is unlikely to improve his standing as a world leader in his remaining days. The United States and the United Nations must keep pressure on Qadhafi and his regime to comply with the demands related to accepting responsibility for his previous support of terrorist activities. If the international arena makes demands as a group but allows individual countries to deal unilaterally with Qadhafi, he will easily be able to overcome the hardships intended by the applications of sanctions. Sanctions appear to have worked in the past with Qadhafi, but only when the sanctions exceeded his comfort level.

Enhanced Intelligence. Our ability to detect covert activities and the direction of political trends in some parts of the world have seriously deteriorated due to a dramatic decrease in funding and training for human intelligence (HUMINT) resources. The U.S. needs revitalized HUMINT resources in Libya to accurately assess the Libyan population's willingness to accept a change of leadership, and the kinds of policies they would most likely be willing to support. When and if the correct conditions exist, U.S. intelligence assets could then play a major role in formulating American steps to influence the transition to a post-Qadhafi government. Several nations would benefit from the rise to power of a Libyan leader interested in maintaining economic, political,

and military ties with the West. The United States could play a part in helping either a member of Libya's former ruling family or a disenfranchised member of the Qadhafi regime gain power following Qadhafi's death or removal from power. This kind of intelligence is most effectively gathered in person rather than remotely.

Recognize the New Regime. Once a cooperative leader is in place in Libya, the United States must lead the international charge to recognize and support the new regime. The first steps should be the revocation of any remaining economic sanctions against Libya, followed by establishing incentives for the Occidental Petroleum Corporation, Amerada Hess Corporation, Marathon Oil Company, and Conoco, Inc., to return to their oil production facilities on the Libyan coast.¹²⁵ Finally, the United States should assist the new Libyan agriculture industry to develop the capability to provide for all of the country's food needs. The government will garner popular support when the nation becomes capable of feeding its people, and the whole economy will benefit if Libya can become a food exporter in the future.

Punitive Strikes. In the event these peaceful measures do not succeed and the coalition is forced to take military action against the Qadhafi regime, it should remember the lessons of Presidents Reagan and Bush: fight the regime and not the people. President Reagan attempted to definitively separate the Libyan people—and to some extent the military—from the Qadhafi regime as its target in Operation EL DORADO CANYON.¹²⁶ Likewise, President George W. Bush sent American forces to attack Taliban and Al Qaeda positions while simultaneously air dropping food to the people of Afghanistan during the early stages of Operation ENDURING FREEDOM.¹²⁷ These examples demonstrate how American presidents have employed violent military force

against aggressive governments while attempting to form a positive foundation for subsequent relations with the target nation's populace. If the United States is forced to resort to military force against the Libyan government again, we will need to remember these lessons and make protecting the Libyan population from hardship a strategic priority.

There should be no doubt that the United States and Libya will not enjoy cooperative relations as long as Muammar Qadhafi is in power. Fortunately, the U.S. has several options to consider that will negate the Libyan threat to peace in the Middle East while establishing the foundation for a future partnership between the Libyan and American Governments. These options encompass actions the U.S. and its allies should take while Muammar Qadhafi is in power, and after the reigns of power pass to Qadhafi's successor. Careful implementation of U.S. policy actions with respect to Libya can add significant stability to the Middle East and provide the United States with a vital new ally in the global war on terror.

Notes

¹²³ Office of the Press Secretary, "President Delivers State of the Union Address," 29 January 2002.

¹²⁴ Lucien S. Vandenbroucke, "The Israeli Strike Against Osiraq," *Air University Review*, September-October 1984, n.p., on-line, Internet, 27 April 2002, available from <http://www.airpower.maxwell.af.mil/airchronicles/aureview/1984/sep-oct/vanden.html>.

¹²⁵ Greenberger.

¹²⁶ Ledeen.

¹²⁷ Ibid.

Chapter 8

Conclusion

President Bush has set in motion a new war for the United States and its allies. This war will be like no other war that any of us have ever fought. It is a war without boundaries and against non-state foes. Those foes will still rely on governments and economies to provide them the weapons and technology required for them to carry out their violent aims around the world. One of those nations potentially poised to support the Al Qaeda organization and other terrorist groups is Libya, a state formally labeled by the international community as a known sponsor of terrorism. Libya's willingness to support terrorist acts around the world and the determination of the Libyan dictator, Muammar Qadhafi, to acquire weapons of mass destruction makes Libya a threat to all the civilized nations of the world.

This paper examined several factors influencing Colonel Qadhafi's behavior as dictator of Libya and his early pursuit of large conventional armed forces. Next, the paper discusses Qadhafi's eventual quest for acquiring weapons of mass destruction. That discussion included an analysis of Libya's biological, nuclear, and chemical weapons programs, Libya's historical use of its weapons of mass destruction against Qadhafi's foes, and the NBC weapons delivery options in the Libyan inventory.

The paper then focused on Qadhafi's dependence on oil production, how this resource could be preserved and used as a means for rebuilding Libya's post-conflict economy, and an overview of theories for deterring Qadhafi and other rogue leaders. The discussion of oil and what matters to Qadhafi highlighted several reasons why Qadhafi would benefit from a new relationship with the United States, and several reasons why this new relationship would also benefit the U.S and its allies. Following is a summary of what the United States expects from Muammar Qadhafi before a new peaceful alliance between the two countries can proceed, and Qadhafi's reaction to those demands. The paper concludes with a brief discussion of potential courses of change in Libya's leadership, and some recommendations for America's participation in that change.

There are too many uncertainties to predict a precise path for the future of U.S. – Libya relations. However, there is no question that unless the United States maintains a firm stand against Muammar Qadhafi, Libya could once again factor heavily in global terrorism, the proliferation of weapons of mass destruction, and the global war on terror.

Appendix A

Tarhunah: Libya's Ultimate Chemical Weapons Plant

Qadhafi took notice of the ease with which coalition aircraft using precision weapons obliterated hardened structures during the 1991 Persian Gulf War. Fearing a similar attack against his chemical weapons facilities, Qadhafi ordered construction of a hard and deeply buried chemical plant to supplement his facility at Rabta and guarantee Libya's continuing ability to produce chemical weapons.¹²⁸ In 1993, German sources claimed they had evidence that a Thai company was building a poison gas plant identical to the Pharma-150 facility. Not surprisingly, Libya denied that this was a chemical facility, claiming it was merely part of a national irrigation project.¹²⁹

Shortage of water in the principal populated areas along Libya's coast led Qadhafi to launch plans to bring water by pipeline from underground sources in Libya's interior. Qadhafi dubbed this his "Great Man-Made River" project.¹³⁰ This supposedly humanitarian effort was merely a cover story, however. An underground project with hundreds of miles of tunnels, the Great Man-Made River is allegedly part of an effort to transport and store Libya's WMD out of sight of western intelligence agents.¹³¹ Intelligence sources confirmed that Libya was actually in the process of building a deeply buried chemical production facility near Tarhunah, 60 kilometers southeast of Tripoli. The international community recognized this facility as a grave threat to all of Libya's

enemies, and the complex turned the diplomatic and military communities on end for years.

The Tarhunah Facility

Qadhafi received expert assistance in the design and construction of the Tarhunah complex. German intelligence sources obtained copies of the construction plans and building specifications through a number of German and Austrian companies who provided personnel and equipment to the project.¹³² Intelligence sources suspect the design closely mirrored blueprints used by the former Soviet Union to build its large network of underground bomb shelters during the Cold War. This design presumably made Tarhunah impervious to all but a direct hit by a nuclear weapon.¹³³

Though design features of the Tarhunah tunnel complex are tightly held secrets, known details paint a disturbing picture of the project's magnitude. The entrance to the facility is located in the middle of a long, narrow valley between two mountain peaks. The plant is virtually impregnable to conventional air attack because of three 450-foot long tunnels, protected above by 100 feet of sandstone and several feet of reinforced concrete.¹³⁴ The road into the main entrance is wide enough to accommodate two tractor-trailer trucks side-by-side. Less than 100 feet inside the entrance, the road reportedly splits around an enormous mass of rock, then rejoins on the other side to allow access to a huge chamber for the factory.¹³⁵ This rock face obviously complicates any targeting solutions for conventional weapons since it protects the heart of the complex from direct attack. CIA sources estimate that the main chamber encompasses several thousand square feet, and stands nearly three stories high.¹³⁶

TARHUNAH UNDERGROUND CHEMICAL PLANT



Past international attention on Libya's Rabta chemical facility led the Libyans to construct an underground facility at Tarhunah.

Figure 3: Artist's Rendering of the Tarhunah Chemical Complex. Source: Office of the Secretary of Defense, Proliferation: Threat and Response, April 1996, p. 27.

Libya clearly did not possess the physical capability or scientific expertise to produce a facility of this magnitude on its own. When evidence surfaced that Germany's Westfalia-Becorit Company had supplied the 60-ton rotary boring equipment used at Tarhunah, as well as a steady supply of drill bits, German Chancellor Helmut Kohl intervened to prevent further cooperation between companies in his country and the Libyans.¹³⁷ Undaunted, Libya apparently found other sources for the necessary tools in companies from China, India, and Southeast Asia.¹³⁸

Adding to the speculation that the Tarhunah plant was being used for the production of chemical weapons, Libya purchased chemical reactors and piping whose inner walls

are coated with Teflon to make them resistant to corrosive substances. The project also called for a sophisticated Swiss air-purification system protected by fire-resistant materials, and software for a computerized chemical production program.¹³⁹ Clearly, this was not merely an irrigation project.

Faced with an overwhelming preponderance of evidence that Libya was indeed building what Former CIA Director John Deutch claimed was the world's largest chemical weapons plant,¹⁴⁰ the United States was forced to weigh the options available for ensuring this factory would never become operational. Attempts to neutralize the threat posed by a full-scale, deeply buried chemical production facility would be essentially limited to diplomatic efforts and potential military options.

Notes

¹²⁸ 1997 CPRC Report to Congress.

¹²⁹ Guy Arnold, *The Maverick State: Gaddafi and the New World Order* (London: Cassell, 1996), 87.

¹³⁰ Ibid., 27.

¹³¹ Black, 16.

¹³² "Huge Chemical Arms Plant Near Completion in Libya, U.S. Says," *NY Times News Service*, 24 February 1996, n.p., on-line, Internet, 24 September 2001, available from http://archive.nandotimes.com/newsroom/ntn/world/022496/world6_24990.html.

¹³³ Douglas Waller, "Target Gaddafi, Again," *Time*, 1 April 1996, 46.

¹³⁴ Joshua Sinai, "Libya's Pursuit of Weapons of Mass Destruction," n.p., on-line, Internet, 26 September 2001, available from <http://cns.miis.edu/pubs/npr/vol04/43/sinai43.pdf>.

¹³⁵ Douglas Waller, 46.

¹³⁶ Robert Waller. *The Deterrence Series: Chemical/Biological Weapons and Deterrence Case Study #2: Libya* (Alexandria, VA: Chemical and Biological Arms Control Institute, 1998), 5.

¹³⁷ Ibid., 19.

¹³⁸ Joshua Sinai, "Libya's Pursuit of Weapons of Mass Destruction."

¹³⁹ Ibid.

¹⁴⁰ Robert Waller. *The Deterrence Series: Chemical/Biological Weapons and Deterrence Case Study #2: Libya* (Alexandria, VA: Chemical and Biological Arms Control Institute, 1998), 5.

Appendix B

Counterforce Options

Tunnel facilities such as the chemical plant at Tarhunah naturally pose complicated targeting problems. The very nature of their construction even rules out many of the weapons optimized for hardened targets, including those that fared so well during the 1991 Persian Gulf War and recent combat operations. However, the United States arsenal does include a variety of nuclear and conventional weapons that are ready for employment against Tarhunah following an order from the President. In fact, some experts believe the Tarhunah chemical complex can now be targeted with conventional weapons with a good degree of confidence that this class of targets can be destroyed.¹⁴¹ The most capable weapons in the U.S. arsenal for this type of target are the B61-11 nuclear gravity bomb and the GBU-28 conventional bomb. The future looks bright as well, for the U.S. weapons community is actively pursuing development of a new generation of conventional weapons optimized for strikes against these targets.

B61-11

Though it is the most capable weapon available for striking targets like the Tarhunah complex today, the B61-11 is also the most controversial, due to its membership in the family of America's nuclear weapons. Authorized for production in August 1995, the B61-11 first entered the inventory in December 1996.¹⁴² The Department of Energy

modified approximately 50 B61-7 weapons,¹⁴³ repackaging the Los Alamos physics components and Sandia's arming, fuzing, and firing electronics into a one-piece steel earth-penetrating weapon.¹⁴⁴ These modifications allow the weapon to penetrate deeply into any terrain before exploding, multiplying the effectiveness of the nuclear yield due to the confined space.¹⁴⁵



Figure 4: B-2 Spirit dropping a B61-11 test article. Source: www.basicint.org/warheads.htm.

No doubt a direct attack using B61-11s would be militarily effective against Tarhunah, but political pressure against using nuclear weapons, especially against a non-nuclear nation, makes it unlikely barring the most dire and urgent circumstances. Therefore, the U.S. continues its search for an effective conventional penetrator, such as the GBU-28 “Bunker Buster.”

GBU-28

The 5,000-pound GBU-28 is the Air Force's primary conventional weapon currently in the inventory for defeating hardened and deeply buried targets (HDBT). Constructed

from modified Army artillery tubes and fitted with laser guidance kits, the GBU-28 packs a payload of 630 pounds of high explosives that detonate after the warhead has penetrated deeply into the target.¹⁴⁶



Figure 5: GBU-28. Source: <http://www.fas.org/man/dod-101/sys/smart/gbu-28.htm>.

The GBU-28 is designed to penetrate approximately 20 feet of concrete or 100 feet of soil.¹⁴⁷ Still, not all HDBT would be held at risk by this weapon, so there is a definite need for an additional array of weapons capable of attacking the hardest of targets.

The Future

The Defense Special Weapons Agency and the Defense Intelligence Agency are engaged in a comprehensive program to develop, evaluate, and demonstrate a new generation of tunnel-defeat weapons.¹⁴⁸ The scope of this appendix permits only a cursory look at these future opportunities, including the Advanced Unitary Penetrator coupled with the Hard Target Smart Fuze, and the Surgical Strike Vehicle.

The Advanced Unitary Penetrator (AUP) is a narrow, hardened weapon designed to bury itself deeply into rock and other hard materials before exploding. Though the warhead is relatively small, the AUP, like the B61-11, takes advantage of its penetration

capability to increase the explosive effects of its warhead. Coupled with the Hard Target Smart Fuze, which provides a variety of options for triggering a weapon's detonation, the AUP represents a definite improvement in current capabilities against hardened targets.¹⁴⁹ Its use against a target such as Tarhunah, however, would most likely be limited to disrupting ventilation, environmental controls, or communication nodes for a functional kill alone.

The Surgical Strike Vehicle (SSV) is a B-52H-launched, rocket-propelled missile system using Global Positioning System guidance for precise, hypervelocity attack against hardened and deeply buried targets. Its 1,800-pound body and high speed provide the penetration and destruction capability required for high value buried targets, and its low probability of detection makes it survivable against enemy countermeasures.¹⁵⁰ In 1995, a small SSV test vehicle was delivered precisely against its target, striking at extremely high velocity and penetrating to an impressive depth of 31 feet into solid granite. Theoretically, a full-scale SSV would provide even greater penetration capability.¹⁵¹ Again, the major features of a target such as Tarhunah would likely be safe from direct SSV attack, but they could be vulnerable to a functional defeat strategy employing this weapon. It is up to the United States scientific community to exploit these and other projects to determine a range of options for attacking targets buried deeply underground.

Notes

¹⁴¹ Lane, 26.

¹⁴² Bruce Hall, *More Penetrating Developments*, 6 March 1997, n.p., on-line, Internet, available from <http://www.fas.org/news/usa/1997/03/bmd970307d.htm>.

¹⁴³ On-line, Internet, available from www.basicint.org/warheads.com.

¹⁴⁴ Hall, n.p.

¹⁴⁵ On-line, Internet, available from www.basicint.org/warheads.htm.

Notes

¹⁴⁶ Lane, 31.

¹⁴⁷ Maj. Gen. Gary L. Curtin, and George W. Ullrich, “The Threats Go Deep,” *Air Force Magazine*, October 1997, 49.

¹⁴⁸ *Proliferation: Threat and Response*, 1997, 74.

¹⁴⁹ Curtin, 48.

¹⁵⁰ Mark A. Bucknam, *Lethal Air Power and Intervention* (Maxwell AFB, AL: Air University Press, 1996), n.p.

¹⁵¹ 1997 Defense Authorization Act Testimony, n.p.

Bibliography

- Alibek, Ken. *Biohazard*. New York: Dell Publishing, 1999.
- Al-Kurdi, Husayn. "Qadaffi vs. New World Order." *Toward Freedom Magazine*, February 1997, n.p. On0line. Internet, 25 November 2001. Available from <http://www.geocities.com/CapitolHill/5260/kurdi2.html>.
- Al-Qaddafi, Muammar, interview with the author. "Why There is Veto on Oil Prices Only..." *The Milli Gazette*, 15 January 2001, n.p. On-line. Internet, 25 November 2001. Available from <http://www.milligazette.com/Archives/15012001/inter.htm>.
- Arnold, Guy. *The Maverick State: Gaddafi and the New World Order*. London: Cassell, 1996.
- Bailey, Kathleen C. *Doomsday Weapons in the Hands of Many: The Arms Control Challenge of the '90s*. Chicago: University of Illinois Press, 1991.
- Berry, Nicholas. "How to 'De-Rogue' Rogue States." *Center for Defense Information Asia Forum*, 15 June 2001, n.p. On-line. Internet, 9 December 2001. Available from <http://www.cdi.org/asia/fa061501.html>.
- Berry, Nicholas. "The Self-Serving 'Rogue State' Doctrine." *Center for Devense Information Asia Forum*, 16 June 2001, n.p. On-line. Internet, 9 December 2001. Available from <http://www.cdi.org/asia/fa061601.html>.
- Black, Craig R. *Deterring Libya: The Strategic Culture of Muammar Qaddafi*. Counterproliferation Papers, Warfare Series #8, USAF Counterproliferation Center. Maxwell AFB, AL: Air University Press, 2000.
- Bucknam, Mark A. *Lethal Air Power and Intervention*. Maxwell AFB, AL: Air University Press, 1996.
- Cimbala, Stephen J., ed. *Deterrence and Nuclear Proliferation in the Twenty-First Century*. Westport, CT: Praeger Publishers, 2001.
- Coughlin, Con. "Missiles Deal Puts Israel in Gaddafi Sights." *London Sunday Telegraph*, 24 September 2000, 1. On-line. Internet, 26 September 2000. Available from <http://ebird.dtic.mil/Sep2000/e20000925missiles.htm>.
- Counterproliferation Review Committee. *1997 CPRC Report to Congress*. On-line. Internet. Available at <http://www.au.af.mil/au/awc/awcgate/cprc97.htm>.
- Curtin, Gary L., and George W. Ullrich. "The Threats Go Deep." *Air Force Magazine*, October 1997, 49.
- Drell, Sidney D.; Abraham D. Sofaer; and George D. Wilson, ed. *The New Terror: Facing the Threat of Biological and Chemical Weapons*. Stanford, CA: Hoover Press, 1999.
- El-Kikhia, Mansour O. *Libya's Qaddafi: The Politics of Contradiction*. Gainesville, FL: University Press of Florida, 1997.
- Greenberger, Robert S. "Sept. 11 Girds Gadhafi to Buckle Down in His Work to Get Off U.S. Terror List." *Wall Street Journal*, 14 January 2001, 1.

- Hall, Bruce. *More Penetrating Developments*, 6 March 1997, n.p. On-line. Internet, 24 September 2001. Available from <http://fas.org/news/usa/1997/03/bmd970307d.htm>.
- "Huge Chemical Arms Plant Near Completion in Libya, U.S. Says." *NY Times News Service*, 24 February 1996, n.p. On-line. Internet, 24 September 2001. Available from http://archive.nandotimes.com/newsroom/ntn/world/022496/world6_24990.html.
- Lane, Gary W. *New Conventional Weapons: Reducing Reliance on Nuclear Response Toward Aggressors*. Maxwell AFB, AL: Air University Press, 2001.
- Ledeem, Michael. "Part of the Problem." National Review Online, 8 October 2001, n.p. On-line. Internet, 12 February 2002. Available from <http://www.nationalreview.com/contributors/ledeen100801.shtml>.
- "Libya." Chemical and Biological Weapons Site, 16 November 2000, n.p. On-line. Internet, 4 December 2001. Available from <http://www.cdi.org/issues/cbw/Libya.html>.
- "Libya Has Trouble Building the Most Deadly Weapons." *The Risk Report*, Volume 1, Number 10, December 1995, n.p. On-line. Internet, 4 December 2001. Available from <http://www.wisconsinproject.org/countries/libya/trouble.html>.
- "Libya's Qadhafi Seizes Opportunity to Move Out of Isolation While Expanding Raccidal Activities, Including CBW Development." *Defense and Foreign Affairs Daily*, 8 November 2001, n.p.
- "Major Changes Continue to Move Libya into the Forefront of Strategic Focus." *Defense and Foreign Affairs Daily*, 4 February 2002, n.p.
- Neumann, Ronald. "U.S. Policy Toward Libya." 30 November 1999, n.p. On-line. Internet, 10 December 2001. Available from http://fas.org/news/libya/991130_neumann_libya.htm.
- Office of the Press Secretary. *President Delivers State of the Union Address*. 29 January 2002, n.p. On-line. Internet, 20 April 2002. Available from <http://www.whitehouse.gov/news/releases/2002/01/print/20020129-11.html>.
- Office of the Secretary of Defense. *Proliferation: Threat and Response*. Washington, D.C.: U.S. Government Printing Office, 1996. On-line. Internet, 28 April 2002. Available from http://www.defenselink.mil/pubs/prolif/me_na.html.
- Office of the Secretary of Defense. *Proliferation: Threat and Response*. Washington, D.C.: U.S. Government Printing Office, 1997.
- Qaddafi, Muammar. *Escape to Hell and Other Stories*. Montreal: Stanke, 1998.
- "Qaddafi's African Dream." *Economist*, 16-22 September 2000, n.p. On-line. Internet, 20 September 2000. Available from <http://ebird.dtic.mil/Sep2000/s20000919dream.htm>.
- Simons, Geoffrey L. *Libya: The Struggle for Survival*. New York: St. Martin's Press, 1993.
- Sinai, Joshua. "The Future of Libya's Weapons of Mass Destruction Program." *Missile News*, August 1998, n.p. On-line. Internet, 4 December 2001. Available from <http://www.cdiss.org/col99apr27.htm>.
- Sinai, Joshua. Libya's Pursuit of Weapons of Mass Destruction. *The Nonproliferation Review*, Spring-Summer 1997, 92-98.
- Sinai, Joshua. "Qaddafi's Quest." *Jewish Virtual Library*. Reprinted from *Near East Report*, 20 March 2000, n.p. On-line. Internet, 25 November 2001. Available from http://www.us-israel.org/jsource/Threats_to_Israel/Qaddafi.html.

- Tanter, Raymond. *Rogue Regimes: Terrorism and Proliferation*. New York: St. Martin's Griffin, 1999.
- U.S. Department of State Bureau of Public Affairs. *Background Notes: Libya*. July 1994, n.p. On-line. Internet, 13 February 2002. Available from <http://dosfan.lib.nic.edu/ERC/bgnotes/nea/libya9407.html>.
- U.S. Senate. *U.S. Foreign Policy Toward Libya: Hearing Before the Subcommittee on Near Eastern and South Asian Affairs of the Committee on Foreign Relations*, 101st Cong., 2d sess., 4 May 2000.
- Vandewalle, Dirk, ed. *Qadhafi's Libya, 1969-1994*. New York: St. Martin's Press, 1995.
- Vandenbroucke, Lucien S. "The Israeli Strike Against OSIRAQ." *Air University Review*, September-October 1984, n.p. On-line. Internet, 27 April 2002. Available from <http://www.airpower.maxwell.af.mil/airchronicles/aureview/1984/sep-oct/vanden.html>.
- Waller, Douglas. "Target Gaddafi, Again." *Time*, 1 April 1996, 46-47.
- Waller, Robert. *The Deterrence Series: Chemical/Biological Weapons and Deterrence Case Study #2: Libya*. Alexandria, VA: Chemical and Biological Arms Control Institute, 1998.
- Waller, Robert. "The Libyan Threat to the Mediterranean." *Jane's Intelligence Review*, May 1996, 225-229.
- Weapons of Mass Destruction in the Middle East*. Center for Non-Proliferation Studies, Monterey Institute of International Studies, n.p. On-line, 3 December 2001. Available from <http://www.cns.miis.edu/research/wmdme/libya.htm>.
- Wiegele, Thomas C. *The Clandestine Building of Libya's Chemical Weapons Factory*. Carbondale, IL: Southern Illinois University Press, 1992.