

South Africa from the Perspective of WMD Supply Networks: Indications and Warning Implications

Strategic Insights, Volume VI, Issue 5 (August 2007)

by Stephen F. Burgess

Strategic Insights is a bi-monthly electronic journal produced by the Center for Contemporary Conflict at the Naval Postgraduate School in Monterey, California. The views expressed here are those of the author(s) and do not necessarily represent the views of NPS, the Department of Defense, or the U.S. Government.

Introduction

South Africa dismantled its nuclear weapons program in 1991, chemical and biological warfare program in 1993, and missile program in 1994 and became a “disarmament trendsetter” in bringing to signature an “African Nuclear Weapons Free Zone” in 1995 and compromise in Nuclear Non-Proliferation Treaty (NPT) review conferences in 1995, 2000, and 2005. Despite the South African government’s continuing commitment to WMD nonproliferation and arms export controls, several issues related to WMD proliferation remain. This paper examines proliferation problems and transnational networks that are tied to South Africa’s history as a developer of weapons of mass destruction and other weapons during the apartheid era (1948-1994). The problem of nuclear proliferation is examined through the lens of the recent A.Q. Khan case and involvement by a South African network. The problem of biological weapons proliferation is illustrated through the recent case of Dr. Daan Goosen—a key scientist in the 1980s biological warfare program (Project Coast) and the former director of the Roodepoort Research Laboratories. The problem of terrorism and transnational networks is examined using evidence of al-Qaeda activities and those of related groups in South Africa. Links are drawn between WMD proliferation supply and terrorist networks and indications and warning of WMD terrorism emanating from South Africa are examined.

The A.Q. Khan Network in South Africa and Nuclear Supply Networks

The September 2004 discovery of a South African connection to A.Q. Khan’s nuclear proliferation network led to the arrests of four business and engineering figures, including some who had been involved in the former apartheid regime’s nuclear weapons program of the 1970s and 1980s. South African police arrested Johan Meyer of Tradefin Engineering on suspicion of manufacturing centrifuge parts and equipment for Libya. Tradefin produced the elaborate equipment needed to insert and withdraw the uranium hexafluoride gas that is enriched in centrifuges. Tradefin also attempted unsuccessfully to make the sensitive maraging steel rotors for the P2 centrifuges.^[1]

Meyer admitted to prosecutors that he knew that the items were for a uranium-enrichment plant. Based on his testimony, other individuals were arrested, including Gerhard Wisser, a German citizen and owner of Krisch Engineering in South Africa, who had a long history of involvement with other members of the network. Wisser had been arrested a month earlier in Germany for his

alleged role in producing centrifuge parts in South Africa for delivery to Libya and was out on bail in South Africa.[2]

Daniel Jacobus Van Beek, director of South Africa's counter-proliferation office, participated in the raid and called the scheme "one of the most serious and extensive attempts" to breach international nuclear controls.[3] The activities took place in spite of the fact that South Africa has one of the world's strictest anti-proliferation laws, with severe sentences and financial penalties for violators. Van Beek estimated that the 200 tons of equipment was worth about \$33 million.[4]

In November 2004, the Swiss government arrested Gotthard Lerch, a German citizen, who had been employed by Leybold Heraeus, a German company that developed and produced vacuum products and technology. Before undergoing internal reform in the early 1990s, Leybold Heraeus and its sister companies had been major suppliers to many secret nuclear weapons programs, including the one in South Africa as well as in Iraq, Iran, and Pakistan. A Malaysian police report mentioned that Lerch was allegedly involved in trying to obtain centrifuge parts for Libya from South Africa. Germany asked Switzerland to arrest Lerch so that he would not be free when Wisser was released on bail by South African authorities.[5]

The A.Q. Khan arrests underscored the fact that South Africa still has a domestic nuclear energy program and the kind of sophisticated manufacturing machinery, expertise, and industrial infrastructure sought by states and organizations seeking to build nuclear weapons. The Khan case shattered the complacency in South Africa and elsewhere about how effective national and international export controls have been in stopping illegal nuclear or nuclear-related materials. South Africa is a Nuclear Suppliers Group (NSG) member, but investigations have shown that the government did not adequately implement its national export control and nuclear nonproliferation laws, despite its commitments as a NSG member.[6] South Africa's NSG membership enabled companies assisting the Khan network to receive items from other NSG members essentially without checks on their potential end use. The failure of this NSG country to stop the illicit manufacture of centrifuge components is one of the most embarrassing aspects of this scandal. Thus, South Africa remains a major source of concern in terms of nuclear supply networks and indications and warning of nuclear terrorism.

The Goosen Case and South African Biological Weapons Supply Networks

Concerns about biological weapons proliferation originating from South Africa escalated with the publication of a series of articles in the *Washington Post* in April 2003. The articles revealed that in early 2002 Dr. Daan Goosen had offered an entire collection of pathogens, including genetically modified pathogens, to the U.S. Federal Bureau of Investigation (FBI) in exchange for \$5 million U.S. dollars and immigration permits for 19 associates and their families. While personal financial motives were the primary motive of these former Project Coast scientists, their spokesperson, Dr. Goosen, claimed that they had decided to approach the FBI after receiving overtures by several foreigners who were interested in purchasing biological pathogens. These foreigners included "a German treasure-hunter and a man claiming to be an Arab sheik's agent." [7]

The fears of many analysts and policymakers were confirmed by this incident involving scientists, who were experiencing problems making a living in the new South Africa. They had retained specimens and documents that were suppose to have been destroyed in 1993 and were insinuating that they would sell their biological warfare expertise and genetically modified biological agents to the highest bidder, if guaranteed employment was not forthcoming. Even more questions were raised a few months after the *Washington Post* interview, when Dr. Goosen claimed that his group of scientists had informed South African officials that the group had retained proscribed biological agents in their homes. Goosen claims that South African

government officials took DNA fingerprints but allowed the scientists to retain the biological agents.[8]

The revelations in the South African case reconfirm warnings made by proliferation and terrorist experts that arms control approaches, designed to limit the spread of nuclear, biological, and chemical (NBC) weapons of mass destruction, have failed to address newer WMD proliferation threats.[9] The South African case underscores several complicated longer-term WMD proliferation concerns associated with NBC rollback. Recent efforts by a variety of actors to acquire biological agents in South Africa and the still largely unexplained links of American microbiologists to Project Coast illustrate why there is concern about the acquisition and use of biological weapons by individuals, small groups, or networks of groups for a variety of reasons, long after the official state program is eliminated.

A more enduring set of concerns relates to the possibility of illegal sale of arms, components of WMD weapons or expertise that were developed by scientists and engineers who worked on one or more of South Africa's weapons of mass destruction or missile programs. One group of Project Coast scientists has made efforts to obtain work in the United States. There have also been reports of another group of former weapons scientists who also retained pathogens from covert programs and have recently threatened the government that they too will sell their expertise abroad if they do not receive adequate compensation from the South African government. Since the mid-1990s, there have been concerns expressed by both Americans and South African government officials about what former Project Coast scientists would do for a living in South Africa and what they might do if they immigrated to various parts of the world.[10]

Missile and Conventional Weapons Proliferation Threat

Some weapon scientists who worked on missile programs have also been the subjects of proliferation concern. In 2000, South African engineer allegedly sold weapons secrets to Pakistan, helping overcome restrictions on arms sales imposed since the 1999 coup by General Pervez Musharraf. An air weapons specialist was tried on 21 counts that ranged from fraud to theft to contraventions of several laws, including the Armscor Act and the Copyright Act.[11] The regularity of these reports indicates that unemployed scientists and engineers are likely to remain a source of problems and possible proliferation threats for the South African government, and for concerned outsiders such as the United States, for years to come.

Conventional weapons proliferation is also a concern. These weapons were developed at the same time and by many of the same scientists and engineers who worked on South Africa's nuclear weapons and missile programs. With the rise of concerns about the interest of al Qaeda and affiliated terrorist groups in obtaining weapons of mass destruction and radiation bombs, there have been parallel concerns about the same groups seeking ways to enhance conventional bombs. In the 1970s and 1980s, South African scientists developed a small fuel air bomb that could saturate a 2-meter roof of a bunker, and a flag bomb, which is a deflagration bomb that is based on the same principles as a thermalbaric warhead.[12]

Final work on these bombs was conducted at a time when South African weapon designers were still working on missiles. South Africa weapons researchers started developing many of these new conventional bombs, because they were unable to buy new types of bombs from foreign suppliers due to end users restrictions in place since the late 1970s. For example, a precision guided munition, named the Kentron Raptor-1, was developed in the late 1970s. Later, South African weapon builders decided to finalize new conventional bombs rather than focus their efforts on developing biological and chemical warheads because the latter were prohibited by international conventions.

At the time South Africa developed a fuel air bomb in the early 1980s. Only three other countries—the United Kingdom, the United States and the Soviet Union—were known to have deployed them. The defense company, Mechem, manufactured the warhead while Somchem developed a liquid explosive for the bomb. The bomb was not ready for use until the end of the war in Angola in 1988. However, a prototype fuel air bomb was used in counter-insurgency campaigns against SWAPO rebels in South West Africa (Namibia). By the time the fuel air bomb program was stopped in 1989, the bomb could be demonstrated but did not have a rocket available to deliver it.

In recent years, there has been a lot of interest in South Africa's cluster, fuel air, and flag bombs by governments and organizations around the world. One reason for the high demand is because it is difficult to build a fuel air bomb and get the right mix of fuels. A flag bomb is easier to make, as it is an enhanced normal explosive. This characteristic makes a pseudo fuel bomb, which uses TNT, an attractive terrorist weapon that could cause a great deal more damage than the conventional bombs used in recent terrorist attacks in Iraq, Saudi Arabia, Lebanon and elsewhere. Despite the high demand for these conventional bombs, the South African government has adhered to international prohibitions related to conventional arms sales. After the September 11, 2001 attack in the United States, the South African government, like other governments worldwide, reviewed its arms sales policies to be sure that they were strict enough to ensure that terrorists could not purchase these more exotic bombs or a host of other weapons systems developed in conjunction with the former nuclear and missile programs, that is gravity bombs, atomic demolition munitions, low-yield miniaturized devices for artillery pieces, and tactical standoff weapons.

Al-Qaeda Networks in South Africa and WMD Supply Networks

al-Qaeda and its local affiliates have increased their presence in South Africa over the past decade. U.S. and South African authorities now worry about the possibility that radical Islamic groups will succeed in efforts to obtain WMD components, materials or expertise from South Africa; that al Qaeda or affiliate cells will be established and spread in South Africa; and that al Qaeda or affiliates will increasingly be successful in efforts to recruit new foot soldiers from among the poor and disaffected youths in poor Muslim neighborhoods in several cities in South Africa.

Extensive press coverage of documents seized at al-Qaeda camps in the mountains of Afghanistan by U.S. military personnel in 2002 alerted many in the informed public to the fact that al-Qaeda members had been interested in obtaining or building a nuclear bomb or enhanced radiation device. Moreover, reports posted on the *NIS Nuclear Trafficking Database* website note that the CIA had been intercepting messages throughout the 1990s that indicated that al-Qaeda members were trying to obtain a nuclear weapon in order to carry out a plan for a "Hiroshima" against America. Several African countries, including South Africa, were targeted by terrorists as possible locations where materials or components for a WMD device could be obtained.[13]

Evidence for this claim came from a grand jury that indicted accused terrorists in New York in 2001. The U.S. Department of Justice indictment of individuals accused of being involved in the 1998 bombings of American embassies in Kenya and Tanzania, noted that, "at various times at least since early 1993, Osama bin Laden and other known and unknown terrorists made efforts to obtain the components of nuclear weapons." [14] According to press accounts, the indictments provided evidence from a former al-Qaeda member of attempts by group members to buy uranium of South African origin. These efforts were in addition to other efforts to buy a complete warhead or weapons-usable materials from Central Asian states or from Chechen criminal groups in a money-and drug in exchange for nuclear weapons deal.[15]

Additional details about al Qaeda's efforts to obtain WMD materials came from the testimony of the suspected al Qaeda terrorists before the New York grand jury. Testimony was taken from each of the alleged conspirators in the 1998 bombings of the U.S. embassies in Kenya and Tanzania, which killed 224 people. However, one suspect who turned states evidence (named Fadl) provided a detailed account of how the group's desire to acquire chemical weapons and uranium for an atomic bomb brought them into contact with officials in Sudan. Fadl testified that his group expressed their interest in buying chemical weapons and told how a Sudanese military officer had offered to sell uranium to al Qaeda for \$1.5 million. Fadl claimed that the Sudanese military officer showed the bin Laden's agents a two-foot cylinder that purportedly contained the fissile material, along with documents that were allegedly from South Africa. Fadl said he received a \$10,000 bonus for arranging the sale but did not know whether it was ever consummated. Nor did he know whether the cylinder held bomb-grade uranium, leaving open the strong possibility that the deal was a scam.[16]

Even more attention was directed towards South Africa by U.S. authorities since the November 2002 suicide bombing in Kenya. A previously unknown group, the Army of Palestine, claimed responsibility for the attack and a failed missile attack on an Israeli airliner. The 2002 attack, along with the bombings of the U.S. embassy in Kenya in 1998, were interpreted by U.S. and South African officials as the work of al-Qaeda and affiliate groups. Concerns were expressed in both countries about the possibility that South Africa (along with several other African states) was being used as, "potential breeding grounds, as well as safe havens for terrorist networks." [17] South African officials acknowledged that al-Qaeda operatives may have been operating out of South Africa for years. The main concern of authorities in the United States and South Africa governments was the possibility that several militant Islamic organizations were smuggling gold, diamonds and cash via Durban and Mozambique to Pakistan and Dubai. President Mbeki also warned the public that al-Qaeda operatives might be establishing a presence in South Africa after the September 11, 2001 attacks in the United States. Mbeki noted that the success of American and European authorities in routing out al-Qaeda cells in other countries, may have led many members of these covert networks to find new bases.[18]

In the same statement, Mbeki acknowledged that after the 1998 bomb blast at Planet Hollywood in Cape Town, the South African National Intelligence Agency had warned him that foreign Islamic extremists were hiding in South Africa.[19]

The seriousness of warnings about al-Qaeda in South Africa acquired more credence after Khamis Khalfan Mohamed, an al-Qaeda operative from Tanzania who was allegedly involved in the 1998 bombing of the American Embassy in Dar-es-Salaam, took refuge in South Africa before he was arrested in Cape Town and extradited to the United States.

There have also been several public reports in recent years that al-Qaeda and other Islamic extremists are using South Africa as a base from where they can regroup, raise and launder money, and plan more terror attacks. The United States and authorities in other Western states remain concerned about the prospect of terrorists using South Africa as a base of operations. The country has a world-class banking system and stock market, a modern telecommunication system, good road and rail network system and broad civil liberties, all of which makes it easy to move people and money. There were reports that al-Qaeda was buying gold and diamonds to make it more difficult to trace the organization's wealth in Africa. In 2002, Mohamed Suleman Vaid and his wife Moshena of Durban were arrested at a Swazi border post with more than 1 million rand hidden in their clothing. Vaid denied that the money was meant for al-Qaeda, but authorities claimed that the money was on its way to a Mozambique citizen with al-Qaeda connections.[20]

In recent years, the South African government has responded to the growing presence of radical Islamic terrorist groups. For example, to better cope with these allegations South African special police unit, the Scorpions, have increased their cooperation and coordination with their role model,

the FBI. The Scorpions have also increased their cooperation with counterpart at similar investigative services in several Europe and Asian countries.

In the past two years, the South African National Intelligence Agency and the South African Secret Service and the Ministry of Home Affairs have uncovered a terrorist ring and funding for terrorists in South Africa.[21] There is considerable activity, including trafficking and falsifying documents, as well as the funding of mosques and madrassas.[22] The July 2005 London bombings have been traced to this ring. Islamic radicalism and terrorist support networks are concentrated in Fordsburg, a southern suburb of Johannesburg, and in Durban, and the more affluent communities appear the most susceptible to radical Islam. Saudis, Iranians, and Pakistanis have been providing money to fund radical Islamic groups in South Africa.[23]

Conclusion

The existence of proliferation networks in South Africa alongside terrorist networks are a cause for concern. The possibility exists that WMD and related materials have been or will be offered for sale in South Africa to al-Qaeda and other terrorist networks with a presence in South Africa. Thus far, there is no evidence that the proliferation and terrorist networks have intersected. There is also the issue of what al-Qaeda and other terrorist organizations would do if they were able to obtain sophisticated WMD devices and materials, such as centrifuges and weapons-grade anthrax. The prospects for states, such as Iran, acquiring WMD devices and materials are greater, as is the possibility that those types of states will pass on WMD to terrorist organizations. Therefore, South Africa will remain a subject of scrutiny for some time to come in order to provide indications and warnings of WMD terrorism.

About the Author

Dr. Stephen F. Burgess is Associate Professor and Deputy Chair, Department of International Security Studies, U.S. Air War College and an Associate Director of the U.S. Air Force Counterproliferation Center (CPC). Since 1999, he has taught courses on U.S. national security decision-making, global security, international organizations and peace operations (peace and stability operations), and African politics and security.

His three books are *South Africa's Weapons of Mass Destruction* (with Helen Purkitt), Indiana University Press, 2005, *Smallholders and Political Voice in Zimbabwe*, and *The United Nations under Boutros Boutros-Ghali, 1992-97*. Dr. Burgess co-authored a monograph for the USAF CPC, *The Rollback of the South African Chemical and Biological Warfare Program*, featured on *60 Minutes* and in *The New York Times* and *The Washington Post*.

He continues to research and publish on African, South Asian, and United Nations security issues. Before 1999, Dr. Burgess was a faculty member at Vanderbilt University, the University of Zambia, and Hofstra University. He completed his Ph.D. at Michigan State University and was a Fulbright research fellow at the University of Zimbabwe.

This paper was originally presented at a conference on Terrorism, Transnational Networks and WMD Proliferation: Indications and Warning in an Era of Globalization held on July 25-27, 2006 at the Naval Postgraduate School in Monterey, CA.

For more insights into contemporary international security issues, see our *Strategic Insights* home page. To have new issues of *Strategic Insights* delivered to your Inbox, please email ccc@nps.edu with subject line "Subscribe." There is no charge, and your address will be used for no other purpose.

References

1. David Albright and Corey Hinderstein, "[Unraveling the A.Q. Khan and Future Proliferation Networks](#)," *The Washington Quarterly* 28, no. 2 (Spring 2005): 115.
2. *Ibid.*, 117-118.
3. Douglas Frantz and William C. Rempel, "[New Branch Found in Nuclear Network: South African affiliates of a Pakistani scientist's proliferation ring tried to outfit Libya with an off-the-shelf uranium enrichment plant](#)," *Los Angeles Times*, November 28, 2004.
4. *Ibid.*
5. Albright and Hinderstein, *Op. Cit.*, 118.
6. *Ibid.*, 118-119.
7. Joby Warrick and John Mintz, "[Lethal Legacy: Bioweapons for Sale; U.S. Declined South African Scientist's Offer on Man-Made Pathogens Copyright](#)," *Washington Post*, April 20, 2003, A1. Other reports surfaced during the latter half of 2002 alleging that a deal involving an apartheid-era general selling Project Coast pathogens to al Qaeda had been foiled when the former general died under suspicious circumstances.
8. Interview with Daan Goosen by Helen Purkitt in Pretoria, South Africa, June 26, 2003.
9. For a summary of research on the nature of emerging biological warfare threats see, Guy B. Roberts, [Arms Control Without Arms Control: The Failure of the Biological Weapons Convention Protocol and a New Paradigm for Fighting the Threat of Biological Weapons](#) (U.S. Air Force Academy, Colorado: Institute for National Security Studies (INSS) Occasional Paper, no. 49, March 2003).
10. Many former Project Coast scientists continue to experience difficulties finding professional employment. See Robert Block, "[Biohazard: Bitter Researchers Are Big Question In Germ Warfare—Closing of South African Lab in '90s Isolated Scientists Ripe for Recruitment Now—Ankle-Deep in Chicken Guts](#)," *Wall Street Journal* (electronic version), May 20, 2002; and "A Cautionary Disarmament—South Africa's Surrender of Nuclear Arms Was Only Half the Battle," *Wall Street Journal* (electronic version), January 31, 2003.
11. Report in the web-based summary of articles in the *Mail and Guardian* (South Africa), March 29, 2000.
12. Dr. Vernon Joynt, Mechem and the Council for Scientific and Industrial Research (CSIR), Pretoria, conducted by Stephen Burgess, June 14, 2000.
13. "[Nuclear Trafficking Database](#)," *NIS* 38, *The Nuclear Threat Initiative (NTI)*. Graham Allison and Andrei Kokoshin, "The New Containment: An Alliance against Nuclear Terrorism," *The National Interest* (Fall 2002): 35-43.
14. Based on summary located in "[Nuclear Trafficking Database](#)," *Ibid.*, 38. According to this summary prepared in 2002, there were 345 research reactors in 58 states that together contained 20 metric tons of highly enriched uranium (HEU). Many individual locations had enough HEU to produce a nuclear bomb.

15. *Ibid.*, 38.

16. Vernon Loeb, "Terrorism Trail Pulls Veil from Hard Cell," *Washington Post*, May 24, 2001, A16.

17. The quote is taken from a U.S. State Department Report on Terrorism published in 2002 and summarized in a South African newspaper account. See Adam Tanner, "Al-Qaeda presence in SA—expert," *Die Burger*, November 28, 2002.

18. Pierre Steyn, "Concern about al-Qaeda in SA," *Die Burger (South Africa)*, October 12, 2002.

19. *Ibid.* An unnamed source reported in one local South African press account that members of both Palestinian Hamas and the Lebanese-based Hezbollah underwent paramilitary training in South Africa.

20. This account of the Vaidis' arrest is taken from Steyn, *Ibid.* Some of the recent concerns about the use of South Africa by al Qaeda to move diamonds and money through South Africa are listed in the U.S. State Department 2002 Terrorism Report discussed in Steyn, *Ibid.* See also a report in the *Mail and Guardian (South Africa)*, March 25, 2003.

21. Kurt Shillinger, South African Institute of International Affairs, Johannesburg, interviewed September 7, 2005.

22. Kurt Shillinger, *After London: Reassessing Africa's Role in the War on Terror*, American Enterprise Institute, September 2005.

23. Shillinger commented that U.S.–South African relations in the war on terror still suffer from the fact that many American officials in the 1980s (including Dick Cheney) called the African National Congress (ANC) a terrorist organization. The Minister of Intelligence Services, Ronnie Kasrils, in a recent talk at the U.S. Naval War College, spoke about those issues. Shillinger also observed that The South African constitution is a problem in the war on terror; as there are lots of legal ways to stay in South Africa.