

State and Non-State Actors

By Donald Turner

Nuclear weapons expansion pertains (1) to the expansion of their arsenals by nuclear weapons states (2) to the new development of nuclear weapons by states which do not have such weapons, and more recently, (3) to the acquiring of nuclear weapons by non-state actors. The progression of nuclear proliferation, especially in the first era of expansion, relied significantly on individual government sponsored and funded weapons programs for states to develop nuclear arsenals, but has since moved to technology sharing by governments and further to technology sharing by individual actors and Non- Governmental Organizations (NGOs).

State Proliferation Progression

Nuclear weapons development was concentrated in a few countries during and just after WWII. By the time the Nuclear Non-Proliferation Treaty (NPT) was ready for signing in 1968, five states had developed nuclear arsenals (in order of acquisition): United States, Soviet Union (now Russia), United Kingdom, France and China. These are identified as “nuclear weapons states” by the NPT. There has been limited proliferation since then, to India, Pakistan, probably Israel and, most recently, North Korea. It is thought that proliferation to Iran is in the offing.

This proliferation has occurred despite international efforts to prevent it, despite the NPT and the International Atomic Energy Agency (IAEA), which monitors the relevant activities of the nuclear weapons states and non-nuclear weapons states. The weakness of these safeguards is that they rely considerably on individual governments candidly reporting that they have created or acquired fissile material which they are using to build weapons.

When countries source the fuel indigenously and enrich it in government facilities, the process remains clandestine and may go unreported. Alternatively, when countries secure fissile material, other components, or know-how on the black market, the proliferation process can also be hidden from sight. Until the end – when bomb testing is more easily discernible or is even announced – but by then, proliferation has occurred.

A most curious story in the annals of proliferation is that of South Africa, which developed nuclear weapons under one regime and gave them up under another. Though never officially acknowledged by Israel, there have been several reports and testimony that Israel helped supply South Africa with the technology and fissile materials necessary to complete a small nuclear arsenal. David Albright and Chris McGreal have claimed that South African projects to develop nuclear weapons during the 1970s and 1980s were undertaken with some cooperation from Israel.¹ According to the Nuclear Threat Initiative, by one account, in 1977 Israel traded 30 grams of tritium for 50 tons of South African uranium and in the mid-80s assisted with the development of the RSA-3 ballistic missile.² Also in 1977, it was reported that South Africa

¹ Bulletin of the Atomic Scientists: South Africa and the affordable bomb (David Albright) South Africa and the affordable bomb July/August 1994, Vol. 50 No. 4, pp. 37-47.

² Missile Chronology (South Africa). Nuclear Threat Initiative. May 2003.

signed a pact with Israel that included the transfer of military technology and the manufacture of at least six nuclear bombs.³

When the government of Nelson Mandela dismantled the program, South Africa had six viable bombs, and a seventh under construction. All were destroyed and South Africa acceded to the Nuclear Non-Proliferation Treaty in 1991. On August 19, 1994, after completing its inspection, IAEA inspectors confirmed the full inventory had been dismantled and that they were satisfied that South Africa's nuclear program had been converted to peaceful applications, making South Africa the first nation which voluntarily gave up nuclear weapons it had developed itself.

Israel itself is widely believed to possess nuclear weapons, yet the government officially neither confirms nor denies such possession. Although no official statistics exist, it has been estimated that Israel possesses between 60 to 400 thermonuclear weapons, believed to be of Teller-Ulam design, with each one in the megaton-range.⁴ International Atomic Energy Agency (IAEA) Director General Mohamed ElBaradei regards Israel as a state possessing nuclear weapons.⁵ The ambiguity surrounding its nuclear position makes Israel a difficult state to assess in terms of weapons proliferation. It is one of a few nations that has not signed the Nuclear Non-Proliferation Treaty and, hence, is not subject to the IAEA inspections non-nuclear weapons states routinely undergo.

Dual Use Technology

In state driven nuclear weapons proliferation, most of the spread appears concentrated around dual use materials that can be utilized for nuclear reactors to produce electricity or for weapons. The enriched uranium used in most reactors is not concentrated enough to build a bomb. However, many of the plants and technology used to enrich uranium for power generation can be used to make the highly enriched uranium needed to build a bomb.⁶ Not only is uranium material available, but nuclear reactors also have the ability to produce plutonium fissile material. While the plutonium resulting from normal reactor fueling cycles is less than ideal for weapons use, a usable weapon can be produced from it.⁷

Technology Proliferation

While in-house development of nuclear weapons programs is an available option to state actors, there have been incidents where technology has spread through black market developments. One such incident that led to the spread of much information and material is related to Abdul Qadeer Khan (A.Q. Khan), convicted of disseminating nuclear weapons technology as early as 1989 to

³ P.W. Botha felt Israel had betrayed him. *Jerusalem Post*. 2006-11-02

⁴ Brower, Kenneth S., "A Propensity for Conflict: Potential Scenarios and Outcomes of War in the Middle East," *Jane's Intelligence Review*, Special Report no. 14, (February 1997), 14-15.

⁵ Mohamed ElBaradei (27 July 2004). Transcript of the Director General's Interview with Al-Ahram News. International Atomic Energy Agency.

⁶ Babur Habib et al. (2006). "Stemming the Spread of Enrichment Technology." Woodrow Wilson School of Public and International Affairs.

⁷ Victor Galinsky, Marvin Miller & Harmon Hubbard (2004). "A Fresh Examination of the Proliferation Dangers of Light Water Reactors." Nonproliferation Policy Education Center.

Iran and Libya and ties to North Korea. On January 25, 2004, Pakistani investigators reported that Khan and Mohammed Farooq, a high-ranking manager at KRL, had provided unauthorized technical assistance to Iran's nuclear weapons program in the late 1980s and early 1990s, allegedly in exchange for tens of millions of dollars. General Mirza Aslam Beg, a Chief of Army Staff at the time, was also said to have been implicated; the *Wall Street Journal* quoted U.S. government officials as saying that Khan had told the investigators that General Mirza Aslam Beg had authorized the nuclear weapons technology transfers to Iran.⁸

Non-State Progression

While much is known about the ability of states to produce clandestine programs to create nuclear arsenals, there is very little known about the ability of non-state actors and groups to continue proliferation of these materials. Most documentation on non-state actors is focused on international organizations such as the United Nations and the IAEA that attempt to stop proliferation, while there is not a significant amount of literature on organizations attempting to acquire nuclear weapons.

Security Risks

There have been many publicly acknowledged attempts by individuals and groups to plan nuclear attacks or to steal nuclear weapons materials. In June 2002, U.S. citizen Jose Padilla was arrested for allegedly planning a radiological attack on the city of Chicago; however, he was never charged with such conduct. He was instead convicted of charges that he conspired to "murder, kidnap and maim" people overseas. In November 2006, MI5 warned that Islamic terrorists, specifically al-Qaida, were planning on using nuclear weapons against cities in the United Kingdom by obtaining the bombs via clandestine means.⁹

In some cases, the idea of proliferation is so pervasive that it nearly becomes part of the culture, as in Russia. According to high-ranking Russian SVR defector Tretyakov, he had a meeting with two Russian businessmen, representing a state-created *Chetek* corporation in 1991. They came up with a project of destroying large quantities of chemical wastes collected from Western countries at the island of Novaya Zemlya (a test place for Soviet nuclear weapons) using an underground nuclear blast. The project was rejected by Canadian representatives, but one of the businessmen told Tretyakov that he keeps his own nuclear bomb at his dacha outside Moscow. Tretyakov thought that man was insane, but another of the "businessmen" (Vladimir K. Dmitriev) replied: "Do not be so naive. With economic conditions the way they are in Russia today, anyone with enough money can buy a nuclear bomb. It's no big deal really."¹⁰ Unfortunately, there was no reported information about the detonation yield or ability of detonation of the device.

⁸ John Lancaster and Kamran Khan, "Musharraf Named in Nuclear Probe: Senior Pakistani Army Officers Were Aware of Technology Transfers, Scientist Says," *The Washington Post*, February 3, 2004

⁹ "Nuclear Terrorism FAQ, Nuclear Terrorism: Frequently Asked Questions." *The Washington Post*, Sept. 26, 2007

¹⁰ Pete Earley, *Comrade J: The Untold Secrets of Russia's Master Spy in America After the End of the Cold War*, Penguin Books, 2007, ISBN 978-0-399-15439-3, pages 114-121.

In addition to the planned attacks and plots, there have also been a number of security risks associated with the ability of private groups to obtain nuclear materials. Of particular concern are the break-away Soviet states that still contain large, sometimes undocumented quantities of nuclear materials.

In August 2002, the United States launched a program to track and secure enriched uranium from 24 Soviet-style reactors in 16 countries, in order to reduce the risk of the materials falling into the hands of terrorists or "rogue states." The first such operation was Project Vinca, "a multinational, public-private effort to remove nuclear material from a poorly secured Yugoslav research institute." The project has been hailed as "a nonproliferation success story" with the "potential to inform broader 'global cleanout' efforts to address one of the weakest links in the nuclear nonproliferation chain: insufficiently secured civilian nuclear research facilities."¹¹

Most shockingly, there have also been reports of armed civilians attempting to break into nuclear power plants in foreign countries, particularly the well publicized case at the Pelindaba nuclear facility near the Hartbeespoort Dam in South Africa.

In November 2007, there was an attack on the plant. Shortly after midnight on Nov. 8, four armed men broke into the Pelindaba nuclear facility 18 miles west of Pretoria, a site where hundreds of kilograms of weapons-grade uranium are stored. They infiltrated the facility, headed towards a control panel in a control room in the facility's eastern block and shot a worker when he resisted.¹² According to the South African Nuclear Energy Corp. (the state-owned entity that runs the Pelindaba facility), these four "technically sophisticated criminals" deactivated several layers of security, including a 10,000-volt electrical fence, suggesting insider knowledge of the system. Though their images were captured on closed-circuit television, they were not detected by security officers because nobody was monitoring the cameras at the time.¹³

Conclusion

In order to keep these types of scenarios from recurring, the international community has highly recommended standardized security practices. While most of the work accomplished in fighting nuclear weapons proliferation has been focused on state actions and on verifying fissile materials within, there is a distinct lack of action by the international community as a whole in addressing non-state movement in acquiring or utilizing nuclear weapons or fissile material.

To add to the complexities of this matter, many non-state actors attempting to acquire nuclear materials are often difficult to locate or dismantle since they may operate as multiple groups with little ties to any central organization. Also, many security standards are set by individual governments, which may be inadequate to respond to a significant incident; a case in point is that of the Pelindaba reactor discussed above. Furthermore, regardless of international involvement and cooperation, security concerns and fissile material documentation plague many of the former Soviet states and there is not much verifiable information available.

¹¹ Philipp C. Bleek, "Project Vinca: Lessons for Securing Civil Nuclear Material Stockpiles," *The Nonproliferation Review* (Fall-Winter 2003) p. 1.

¹² "IAEA concludes lessons of Pelindaba break-in." *World Nuclear News*. 2008-01-28.

¹³ "A Nuclear Site Is Breached." *The Washington Post*. December 20, 2007.

These security risks provide high value targets for non-state actors looking to acquire these technologies. As part of a comprehensive plan for eradicating proliferation of nuclear weapons, special attention needs to be focused on these risks since non-state actors are more likely to utilize nuclear weapons once they have acquired them because they have a unique advantage – that of not being easily identifiable or facing nuclear retaliation.

Country	Warheads active/total*	Year of first test
Five Nuclear Weapons States from the NPT		
United States	2,623 / 9,400	1945 ("Trinity")
Russia (former Soviet Union)	4,840 / 13,000	1949 ("RDS-1")
United Kingdom	<160 / 185	1952 ("Hurricane")
France	~300 / 300	1960 ("Gerboise Bleue")
China	~180 / 240	1964 ("596")
Non-NPT Nuclear States		
India	n.a. / 60-80	1974 ("Smiling Buddha")
Pakistan	n.a. / 70-90	1998 ("Chagai-I")
North Korea	n.a. / <10	2006 (2006 test)
States accused of having nuclear weapons		
Israel	n.a. / 80	unknown or 1979 (See Vela Incident)

Source: Federation of American Scientists: Status of World Nuclear Forces.

<http://www.fas.org/programs/ssp/nukes/nuclearweapons/nukestatus.html>

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