

**VARIABLE AFFECTING THE ACQUISITION OF  
NUCLEAR WEAPONS BY TERRORIST GROUPS:  
A SURVERY OF RECENT LITERATURE AND  
IMPLICATIONS FOR RISK ANALYSIS**

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## **Abstract**

This report examines the general consensus of very recent literature regarding the threat of nuclear terrorism, and seeks to outline any points of contention that are currently disagreed upon, as well as any assumptions that may be incorrect or skewed. This approach focuses solely on the acquisition of nuclear capability, and not on the delivery or ability to detonate weapons in a potential terrorist attack.

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## **Introduction**

The prospect of a nuclear attack by terrorist groups constitutes a “worst-case scenario” that would devastate a country both physically and psychologically. It is hard to imagine that assurance of national security would even be possible in the aftermath of such an event. Many have deemed this risk as “low-risk, high consequence” since it would be quite difficult from end-to-end for a terrorist group to produce or purchase a nuclear weapon, smuggle it into a country undetected, and detonate it. Nonetheless, there has been documented evidence that terrorists are indeed pursuing nuclear capabilities, and their zeal should not be underestimated. This report serves as an introduction and an investigation into recent developments regarding the acquisition of nuclear weapons by terrorists.

### **Terrorist motivation and desire for nuclear capability: Examples from Al Qaeda and Aum Shinrikyo**

Today, there are multiple sub-state terrorist groups that actively pursue nuclear capability to inflict mass destruction on innocent people. Their motivations and ultimate goals vary across a wide spectrum of political, religious, and nationalist beliefs. Due to the very nature of the concept of terrorism – “premeditated, politically motivated violence perpetrated against noncombatant targets by subnational groups or clandestine agents”<sup>1</sup> – it is designed to influence an audience, and these groups will constantly seek to outdo past

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<sup>1</sup> Title 22, United States Code, Section 2656f(d)

terrorist attacks and pursue more deadly wide-spread destruction for their next attack.

Logic would argue that terrorists will pursue nuclear weapons, and concrete evidence has confirmed intentions to reach such capability. Groups such as Al-Qaeda have a confirmed specific intent to use nuclear weapons against the United States. Al-Qaeda's "defensive jihad" ideology suggests that they believe they should use weapons of massive destruction to remove western occupants from the holy land of Iraq, and to claim Jerusalem. This ideology urges Muslims to fight on behalf of what they believe to be attacks on Muslims all over the world<sup>2</sup>. Osama Bin Laden has personally vowed to kill at least four million Americans.

Documents like the "Superbomb," seized by Operation Enduring Freedom, confirm that Al Qaeda has at least begun climbing the learning curve in nuclear weapon science. This document was found in the home of a senior Al Qaeda member, and contains the author's notes regarding nuclear weapons, physics, materials, and ways to produce them. Although the text does not come close to being a recipe for making nuclear weapons, it shows the organization's interest and desire to pursue nuclear capability<sup>3</sup>.

In addition, Bin Laden received a fatwa – a religious ruling given by an Islamic scholar – that he is justified in using nuclear weapons against the United States. Former senior CIA analyst Michael Scheuer reports on the May 2003 decision by Saudi sheik Hamid bin Fahd, "... the treatise found that he was

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<sup>2</sup> "Al Qaeda," MIPT Terrorism Knowledge Base. Accessed at <http://www.tkb.org/Group.jsp?groupID=6>

<sup>3</sup> David Albright, "Al Qaeda's Nuclear Program: Through the Window of Seized Documents". The Nautilus Institute, Special Forum 47: November 6, 2002.

perfectly within his rights to use [nuclear weapons]. [Some] Muslims argue that the United States is responsible for millions of dead Muslims around the world, so reciprocity would mean you could kill millions of Americans.”<sup>4</sup>

Other groups like Japan’s Aum Shinrikyo sought nuclear weapons for their religious beliefs. This Japanese cult believes that their leader, Shoko Asahara, has traveled in time to the future and seeks to trigger the apocalypse so that they may reach salvation in a final battle of good versus evil.<sup>5</sup> Their desire for nuclear weapons reflected this belief, and they attempted to both purchase a turnkey nuclear weapon and build their own nuclear material. Aum had connections with senior Russian officials that they intended to exploit for nuclear information and materials. In 1992, Shoko Asahara reportedly made a \$500,000 to \$1 million donation to Russian Security Council head Oleg Lobov in hopes of fostering a long-term relationship. Ultimately, Russian officials did not transfer sensitive nuclear technology, but Aum did succeed in accessing the Russian black market and gaining chemical weapons capabilities.

Their next attempt involved purchasing a ranch in Banjawarn, Australia to test chemical weapons and mine uranium<sup>6</sup>. Although the uranium proved to be too sparse to extract, Aum succeeded in building a sarin nerve agent that they released into a Tokyo subway in 1995 causing 12 deaths and 5,000 injuries.<sup>7</sup>

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<sup>4</sup> “Bin Laden Expert Steps Forward”. CBS News. Nov. 15, 2004.

<http://www.cbsnews.com/stories/2004/11/12/60minutes/main655407.shtml>

<sup>5</sup> “Aum Shinri Kyo”. MIPT Terrorism Knowledge Base. Accessed at

<http://www.tkb.org/Group.jsp?groupID=3956>

<sup>6</sup> Sara Daly, John Parachini, William Rosenau. “Aum Shinrikyo, Al Qaeda, and the Kinshasa Reactor: Implications of Three Case Studies for Combating Nuclear Terrorism.” Rand Corporation, Project Air Force. 2005.

<sup>7</sup> “Sarin attack remembered in Tokyo.” BBC News, world edition. 20 March, 2005. Accessed at <http://news.bbc.co.uk/2/hi/asia-pacific/4365417.stm>

Sub-state terrorist groups have a unique proclivity to use weapons of mass destruction as a tool of terrorism. First, they are not deterred by the nuclear capability of their targets – Since they have no specific nation to call home, they are not threatened by nuclear retaliation. The nature of terrorist operations, much like organized crime, requires residence in a clandestine location where authorities cannot intervene. In addition, a military strike – let alone nuclear – from the United States sent to a country that is believed to have allowed the production of the weapon, or to have harbored terrorists, could result in an increase in the supportive base for the terrorist group if civilian casualties and emotional propaganda are sensationalized by the media. This would constitute a victory on multiple levels for a terrorist organization.

Due to their clandestine and criminal nature, terrorists can use means such as extortion and kidnapping to achieve the knowledge and materials that they need to build a nuclear weapon. Reports indicate that many groups use kidnapping, robberies, and extortion as fundraisers on a regular basis to raise funds.<sup>8</sup> Perhaps this scenario may have already occurred in secrecy, since the targeted official would certainly fear consequences for reporting the crime to the police/government. Since one nuclear scientist with extensive knowledge and experience in a state-sponsored nuclear program could reveal enough sensitive information to enable the construction of a nuclear weapon, this is a threat that should be carefully considered.

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<sup>8</sup> Yvon Dandurand and Vivienne Chin, “Links Between Terrorism and Other Forms of Crime”. International Centre for Criminal Law Reform and Criminal Justice Policy. Report submitted to Foreign Affairs Canada and U.N. Office on Drugs and Crime. April, 2004.

Finally, terrorist groups are naturally adept at influencing and coercing people into embracing their ideology. The same mechanisms which assimilate a normal person into a terrorist willing to give their life for a cause can be used to assert ideology upon a nuclear scientist or the like. For example, a number nuclear scientists and academics with graduate degrees were drawn into Aum Shinrikyo, whose charismatic leader convinced them to join the cause with promises of resources and flexibility in research, and the chance to reach divine salvation<sup>9</sup>.

## **Fissile materials and their use in nuclear weapons**

It is generally agreed that the biggest hurdle in achieving nuclear weapon capability is obtaining the fissile materials to create the fission core. The core, or “pit”, is the part of the bomb that sets off a nuclear fission reaction which is discharged at once to create an extremely powerful explosion. The two types of fissile materials that can be used in nuclear weapons are highly enriched uranium (HEU) and separated plutonium. These elements occur naturally in the earth, but they must be altered by man-made processes in order to be used in weapons.<sup>10</sup>

Natural plutonium must be processed and enriched at specially designed facilities in order to be converted into weapon grade material. First, the plutonium must be used in a nuclear reactor where it will end up in the spent

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<sup>9</sup> Sara Daly, John Parachini, William Rosenau. “Aum Shinrikyo, Al Qaeda, and the Kinshasa Reactor: Implications of Three Case Studies for Combating Nuclear Terrorism.” Rand Corporation, Project Air Force. 2005.

<sup>10</sup> “Fissile Material Basics”. Institute for Energy and Environmental Research. Accessed at [http://www.ieer.org/fctsheet/fm\\_basic.html](http://www.ieer.org/fctsheet/fm_basic.html)

nuclear fuel along with other byproducts. Next, it must be sent to a reprocessing plant where it is chemically separated from the spent fuel. Only after these two steps will the plutonium be ready to be fitted into a nuclear weapon<sup>11</sup>.

The other type of fissile material, uranium, also must be enriched before it is usable in nuclear weapons. The enrichment of uranium is a difficult and expensive process that requires extremely technical facilities. The methods that are currently used to enrich uranium include using centrifuges, gaseous-diffusion, and electromagnetic separation<sup>12</sup>.

These processes are extremely expensive and require precisely engineered components to operate effectively. However, this does not stop terrorists from purchasing or stealing highly enriched uranium and separated plutonium to avoid this difficult process. Most experts focus on the newly independent states (NIS) that were formed when the Soviet Union collapsed in 1991. Table 1 illustrates the many reports of theft and smuggling of fissile materials in the NIS.

**Table 1:  
Overview of confirmed proliferation-significant incidents of fissile material trafficking in the NIS, 1991-2001**

<b>CASE NAME &amp; DATE OF DIVERSION</b>	<b>MATERIAL DIVERTED</b>	<b>ORIGIN OF MATERIAL</b>	<b>RECOVERY OF MATERIAL</b>
<b>Podolsk</b> 5/92-9/92	1.5 kg of 90% HEU	Luch Scientific Production Association, Podolsk, Russia	10/9/92: Russian police operation intercepted the smugglers in the Podolsk train station.
<b>Vilnius, Lithuania</b>	About 100 g 50%	Institute of Physics	5/93: Approximately 100 g HEU

<sup>11</sup> Ibid.

<sup>12</sup> Ibid.





























