

Strategic Insight

Al-Qaeda and Mass Casualty Terrorism: Assessing the Threat

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The al-Qaeda threat was well known before September 11, 2001, but only after the shocking events of that fateful day did countries around the world mobilize law enforcement, emergency responders, military units, intelligence agencies, and diplomats to fight the war against terrorism. Within a matter of months, positive results began to emerge. Coalition forces defeated the Taliban in Afghanistan, depriving al-Qaeda of a known safe haven, and al-Qaeda operatives have been arrested all over the world. Nevertheless, despite the coalition's successes, al-Qaeda still exists and in alarming force. Evidence suggests that al-Qaeda has regrouped, is training recruits in new techniques and weapons, and is plotting once again to attack the United States and its allies.

This *Strategic Insight* defines the threat that al-Qaeda still poses. It will consider the group's strengths, its methods, and its possible plans. It will review past al-Qaeda attempts to develop unconventional weapons such as nuclear devices. It will identify U.S. vulnerabilities that al-Qaeda might seek to exploit. Lastly, the *Strategic Insight* will define activities that the United States and its allies have taken to combat the threat stemming from al-Qaeda, and in so doing, offer insight into how to combat this threat in the future.

Defining al-Qaeda

Al-Qaeda is not one organization, but a loose confederation of terrorist organizations with members living and operating in over 40 countries, including the United States. Recently, the head of Germany's intelligence service estimated that al-Qaeda is composed of approximately 70,000 people world-wide, with tens of thousands of these undertaking training at al-Qaeda camps in the Sudan, Yemen, and Afghanistan. The common elements among these groups include their Muslim faith, an intense disdain for anything Western, and their support for Osama bin-Laden. Bin-Laden continues to fund many of these groups. Although an estimated \$120 million of his assets have been frozen, some believe bin-Laden is still worth billions. At one point bin-Laden was reported to own or control some 80 companies worldwide.

Al-Qaeda's ultimate goal may be to rid the Middle East of all American influence. In May 2003, recounting the Khobar Towers and National Guard building bombings in Saudi Arabia, a Pakistani paper wrote that "both bombings had marked a bloody gesture against U.S. presence in Saudi Arabia. Indeed the U.S. presence in the Holy Land and in the Middle East in general, has been one of the primary reasons for the al-Qaeda phenomenon, as declared by Osama bin Laden himself."

Operational Capabilities

Even after its monies were frozen and operatives arrested, al-Qaeda maintains the ability to adapt to different situations and to strike almost any time. According to Montgomery C. Meigs, "Al-Qaeda's true operational asymmetry derives from its ability to change its operational system at will in response to the

methods needed to approach and attack each new target. First we saw attacks on embassies with car bombs, next the use of an explosive-laden dinghy to cripple the *USS Cole*, and finally the use of passenger aircraft to produce a human-guided missile. Al-Qaeda adapted in each case, optimizing its structure to fit the various environments of its targets."^[1] Operation Enduring Freedom forced al-Qaeda to move, probably to Yemen with the help of supporters throughout the region. The group may even be operating mobile training camps to keep their cadres fit and plan upcoming events. Terrorist incidents in Indonesia, Jordan, Kenya, Kuwait, Pakistan, the Philippines, Saudi Arabia, Tunisia, and Yemen can all be linked to al-Qaeda. The spate of bombings in these countries indicates that the group continues to be capable.

International logistical support for al-Qaeda may come in many forms. Intelligence agencies report that al-Qaeda has repeatedly used cargo ships to move conventional weapons and explosives, including the explosives used in the 1998 bombings of two U.S. Embassies in East Africa.^[2]

Methods

Al-Qaeda is capable of causing severe damage using a spectrum of capabilities. Known conventional weapons available to the group range from simple suicide bombs, car and truck bombs, boats and aircraft.

Al-Qaeda's unconventional capabilities remain unknown. Based on their past attempts to develop biological and chemical agents, however, it is not difficult to conclude that the group's leaders understand that such weapons can cause mass casualties and mass hysteria. Given the fact that these types of weapons are relatively inexpensive to produce and easy to hide, there is a high probability that al-Qaeda may eventually use them in their operations. In fact, the CIA believes that it may be sooner than most think. In a May 2003 report, CIA analysts claim that there is a high probability that there may be a Chemical, Biological, Radiological, or Nuclear (CRBN) attack within the next two years. The assessment states that the attack would probably be small scale, "incorporating relatively crude delivery means and easily produced or obtained chemicals, toxins, or radiological substances."^[3]

An analysis of past al-Qaeda attacks suggests that the group tends to favor high-profile, often simultaneous, suicide attacks on targets of significant symbolic value to the target country. With such a history, one might conclude that certain weapons, such as biological weapons, may be outside the group's *modus operandi*. For example, an al-Qaeda smallpox attack on a major American center might well result in the massive death and disruption that the group seeks, but it would nonetheless lack the immediate sense of shock that the September 11 attacks or previous attacks had produced. While the delayed effects of biological or even perhaps chemical weapons may not be enough to preclude their use by al-Qaeda entirely, the group's use of unconventional weapons would more likely be limited to nuclear or at least radiological weapons.

Nuclear Explosive Devices (Nuclear Weapons)

David Albright and Corey Hinderstein of the Institute for Science and International Security (ISIS) found that there was "no credible evidence that either bin Laden or al-Qaeda possesses nuclear weapons or sufficient material to make them." However, they commented that, if al-Qaeda obtained enough plutonium or highly enriched uranium, "we believe it is capable of building a crude nuclear explosive, despite several difficult steps." Albright said that, "if al-Qaeda were to build nuclear weapons, it would likely build relatively crude, massive nuclear explosives, deliverable by ships, trucks, or private planes." Annette Schaper of the Peace Research Institute Frankfurt (PRIF) agrees. She believes that a terrorist group could produce a nuclear explosive device with a design similar to the ones dropped on Hiroshima and Nagasaki. According to Schaper, "This terrorist weapon would have a large mass that could only be transported by ship, boat, or lorry, but not by a ballistic missile. Moreover, the creators of such a device could never be entirely sure that it would really explode." Terrorists probably would not be able to test such a device before its initial use. The simplest way that terrorists might side-step technology issues would be to recruit scientists abroad or to send their personnel overseas for training. Scientists from nations that have

programs, such as Pakistan, have already been linked to al-Qaeda. Other possible sources of scientists with this knowledge are Great Britain, the Former Soviet Union, France, or even the United States itself.

If al-Qaeda were to try to develop a nuclear weapon without foreign assistance, its technicians might be able to obtain the weapons design information it needed from an abundance of unclassified documents and drawings on the Internet. Many freely available documents describe the fundamentals of nuclear explosive theory and design. CNN uncovered some of these in a safe house of an al-Qaeda member arrested in Pakistan. Given the open source nature of such documents, however, the information contained in these documents turned out to demonstrate al-Qaeda's interest in nuclear weapons, not its mastery of nuclear physics.

After analyzing some of the documents, David Albright has said that in "over 25 neatly hand-written pages, the author discusses various types of nuclear weapons, the physics of nuclear explosions, properties of nuclear materials needed to make them, and the effects of nuclear weapons. It is not systematic in its coverage and the author sometimes covers some subjects in depth and others superficially or incorrectly. Nor is it a cookbook for making nuclear weapons, as many critical steps to make a nuclear weapon are missing from the document."^[4] According to Annette Schaper, "there are many laborious steps that separate the basic understanding of the operating principles and an actual technical blueprint." Schaper believes it would take several years for an organization to understand these principles, design, and test a device.^[5] Even if they did obtain the capability to construct a device, they would still need to obtain the fissile material that makes up the nuclear weapon's core. In the past, acquiring fissile material has been an even greater obstacle than acquiring access to theories of nuclear weapons design to states interested in developing nuclear weapons.

1992 saw the first recorded incident of al-Qaeda's attempts to acquire nuclear devices and nuclear materials. In 1993, an operative testified that he had gone to a meeting to purchase what he thought was going to be "enriched" uranium.^[6] In 1998, an operative was captured in Germany while attempting to purchase what he also thought would be "enriched" uranium.^[7] The Russian mafia was also reported to have obtained weapons and material from facilities in the former Soviet Union, and was offering to sell this to al-Qaeda members.^[8] Although there is as yet no physical evidence that al-Qaeda has ever been successful, it does not mean they have not obtained this material by some means. From 1992 to 2002, there have been no less than 175 known attempts by terrorists or criminals attempting to acquire or smuggle radioactive substances.^[9] There also are cases of impoverished workers attempting to steal fissile materials, presumably to sell them on the open market. In 1998, workers at a Russian nuclear weapons facility conspired to steal 18.5 kilograms of highly enriched uranium (HEU). Fortunately, authorities thwarted the theft before the material ever left the facility.^[10] The documentary record, however, is mostly filled with cases of failed attempts to obtain nuclear materials. There is no way of documenting al-Qaeda's successes that remain undetected.

Al-Qaeda may have attempted to acquire nuclear material by stealing it from vulnerable sites or by purchasing it from anyone willing and able to sell it. Global stockpiles of weapons grade material can be found in a number of countries. Over 10 years after the end of the Cold War, more than 30,000 nuclear weapons exist worldwide. These weapons amount to approximately 450 tons of military—and civilian—separated plutonium, and over 17,000 tons of HEU. Most of this material can be found within the borders of the five nuclear weapon states, with the overwhelming majority in the United States and Russia. However, there are stocks of plutonium in Belgium, Germany, India, Israel, Japan, and Switzerland. Additionally, there are over 2000 kilograms of HEU used or stored in research reactors in 43 countries, often in sufficient quantities to make a nuclear weapon.^[11]

It is therefore theoretically possible that al-Qaeda could develop a nuclear explosive device, provided it overcame important challenges. First, it must obtain the fissile material needed for the core of the device. After achieving this step, it must then gain access to the nuclear expertise needed to create a design compatible with the acquired fissile material. Finally, the group would need to find a way to test the device to ensure its success, although al-Qaeda may determine that this final step is not necessary. The first two steps, however, present significant challenges to any attempt to develop a nuclear weapon.

Radiological Dispersal Devices (RDD)

Radiological dispersal devices, commonly known as dirty bombs, are more within the reach of al-Qaeda's capabilities. An RDD is essentially a conventional weapon that when detonated spreads radioactive material over a wide area, thus contaminating it. This type of weapon is more suited to terrorist activities for several reasons. First, the ingredients needed are more readily available. They are used in commercial enterprises, medical facilities, and university laboratories. Second, these widely available radiological materials are less radioactive than the materials needed for a device that will generate an explosive nuclear yield. They are relatively easy to handle when it comes to assembling and transporting an RDD. The radioactive material that might be used within an RDD can vary. Third, creating an RDD is much less technically challenging than developing a conventional nuclear explosive device. The design is relatively simple: one need only wrap radioactive material around conventional explosives.

The threat posed by al-Qaeda is not limited however to that group's ability to acquire nuclear or radiological weapons. As evidenced by the September 11 attacks, the group is capable of using a target country's infrastructure against itself. In February 2003, the Department of Homeland Security (DHS) announced that while construction of an RDD is well within the group's capabilities, "Al Qa'ida operatives also may attempt to launch conventional attacks against the U.S. nuclear/chemical-industrial infrastructure to cause contamination, disruption, and terror. Based on information, nuclear power plants and industrial chemical plants remain viable targets."[\[12\]](#) These attacks could involve the use of airplanes or ships as delivery vehicles for conventional weapons against chemical or nuclear facilities to generate a mass casualty event.

Exploiting Vulnerabilities

Al-Qaeda's ability to attack the United States is not just a function of the weapons the organization can buy, produce on its own, or steal. Perceived and actual vulnerabilities in U.S. homeland security can attract the interests of terrorists. Al-Qaeda's past operations suggest that the organization might be particularly attracted to several weaknesses in U.S. security efforts.

Airports

Air freight security needs to be improved. The security procedures of some air carriers and freight forwarders remain vulnerable to terrorist activity. This is due in part to inadequate standards regarding the screening of cargo-handler personnel. For example, Transportation Security Administration (TSA) inspectors have found numerous security violations made by freight forwarders and air carriers during routine inspections of their facilities. Freight forwarders and air carriers are required to have TSA-approved cargo-security programs, and only freight forwarders with an approved security program are permitted to ship freight on passenger aircraft. In addition, the Department of Transportation's Office of Inspector General (OIG) has reviewed and found flaws in the TSA's own shipper program—which automatically allows shippers who have established business histories with air carriers or freight forwarders to forgo new and more stringent security procedures.

Airport security continues to pose challenges to government agencies. In December 2002, a General Accounting Office assessment found that although much was done after 9/11 to strengthen airport security, the Departments of Transportation and Homeland Security face long-term transportation security challenges that include (1) developing a comprehensive transportation risk management approach; (2) ensuring that transportation security funding needs are identified and prioritized and that costs are controlled; (3) establishing effective coordination among the many public and private entities responsible for transportation security; (4) ensuring adequate workforce competence and staffing levels; and (5) implementing security standards for transportation facilities, workers, and security equipment.[\[13\]](#)

Shipping Ports

More than 6 million cargo containers arrive in the United States from overseas each year. Robert Bonner, commissioner of customs and border protection at the Department of Homeland Security notes that there is a continuing concern that al-Qaeda and other terrorists groups might try to place weapons of mass destruction in some of those containers.[\[14\]](#)

Radioactive and Other Radiological Materials

In the United States and around the world, a variety of terrorist attack and insider sabotage scenarios raise real concerns. In the United States, the NRC requires that nuclear power plants have armed guards and a variety of barriers capable of protecting the plants from attacks from a small group of well-armed and well-trained terrorists. Almost half of U.S. reactors, however, failed tests involving groups with similar profiles. It also is worth noting that U.S. reactors are among the best protected in the world.

A recent GAO study also found that, excluding reactor material, there is a great risk of radiological materials falling into the wrong hands. The report's findings identify the many vulnerabilities of radiological stockpiles: a complete tally of sources worldwide does not exist; thousands of sources have been lost; many countries have weak regulations; the United States does not adequately monitor the import and export of its own sources; cases of smuggling of sealed sources increased in the late 1990s; and U.S. and international assistance to help nations track and secure sources is inadequate.[\[15\]](#)

Chemical Factories

Chemical facilities may be attractive targets for terrorists who are intent on causing economic damage and loss of life. Many facilities exist in populated areas where a release of toxic chemicals could threaten thousands. According to a U.S. Environmental Protection Agency (EPA) report, 123 chemical facilities located throughout the nation have toxic "worst-case" scenarios where more than a million people in the surrounding area could be at risk of exposure to a cloud of toxic gas if a release occurred. According to a GAO report, no one to date has comprehensively assessed the security of chemical facilities.[\[16\]](#) A nightmare reminiscent of the December 1984 disaster in Bhopal, India could conceivably fall upon a major American urban center.

Other Vulnerabilities

There are numerous other aspects of the critical infrastructure of the United States that are vulnerable to terrorist attack and that would damage or disrupt large segments of the economy. Such aspects include hospitals, power grids, water purification or agriculture. The August 2003 blackout which left over 50 million Americans without power illustrates the vulnerability of the American energy supply. An intentional attack could have far worse consequences. Elements of the nation's infrastructure may be vulnerable to simple suicide attacks involving conventional weapons, consistent with past al-Qaeda operations, although past attacks have centered on high profile targets. A focus on lower profile yet critical targets such as power stations would signify a change in tactics for al-Qaeda. Nonetheless, the vulnerability of these potential targets demands attention, especially when one considers the disaster that an attack upon such facilities could trigger.

Conclusion

The events of September 11, 2001 proved to the United States that the threat posed by al-Qaeda is significant indeed. The group has thousands of supporters on several continents, with considerable financial resources to fund its activities. This support base enables it to plan and execute intricate plots, such as the 9/11 attacks. In addition, the group seems to operate free of any moral restrictions against the killing of large numbers of innocent civilians. All Americans are targets in the eyes of al-Qaeda operatives, and the more suffering the group can inflict upon its enemy, the better. Furthermore, it is unclear whether the group has any specific goals which, if achieved, would bring an end to its conflict with

the United States. One should conclude that al-Qaeda will continue to launch mass-casualty attacks against American and Western interests around the world for as long as it is capable of doing so.

The first step to contain this threat is to understand it. Al-Qaeda has demonstrated an interest in weapons of mass destruction in the past. This analysis has shown that while significant challenges obstruct attempts to acquire or develop nuclear or radiological devices, these challenges may be overcome. Furthermore, the analysis of the vulnerabilities of the critical infrastructure in the United States suggests that other al-Qaeda may have other options beyond the use of weapons of mass destruction to inflict mass casualties against the American public.

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