

ASSESSING TERRORISM RISK TEN YEARS AFTER 9/11

09.2011

Editor's Note: This month marks the tenth anniversary of September 11, one of the most complex and devastating events in U.S. history. AIR Assistant Vice President Jack Seaquist discusses the current threat level posed by terrorist organizations across the globe, its lasting effects on the insurance industry, and how the event exposed both the challenges and need for modeling terrorism risk.

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REMEMBERING 9/11

The insurance industry—and the world—were changed dramatically by the events of September 11, 2001. The tragic terrorist attacks at the World Trade Center, the Pentagon, and in Shanksville, Pennsylvania took the lives of nearly 3,000 people and generated over USD 40 billion (2010 dollars) of insured losses—the second largest loss in insurance history. Prior to 9/11, it was widely assumed that the risk of losses due to terrorism was considered so low that they were automatically covered under most insurance policies. Unfortunately, that assumption proved to be misguided. The events of that day convinced the insurance industry that catastrophic losses across multiple commercial lines of business can happen simultaneously, suddenly—and with no warning.

THE NATURE OF THE THREAT TODAY

Since 9/11, developments in anti-terrorism efforts by local, state and national agencies, along with political activities overseas, make the terrorism threat in the United States highly dynamic. The groups that pose the threat, the types of weapons they use, and their chosen targets all change over time.

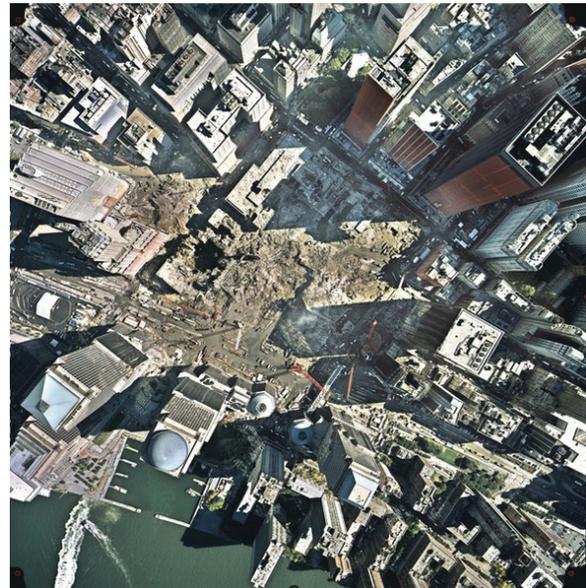


Figure 1. Aerial view from Ground Zero. Source: Wikimedia

Al Qa'ida's core group has suffered from sustained pressure on the leadership in Pakistan, highlighted most recently by the elimination of Osama bin Laden and other top leaders. This has degraded their capabilities to plan and conduct operations against Western countries. Their loss of the



Figure 2. Exterior and interior of U.S. Post Office contaminated with anthrax in 2001 (top), decontamination effort and equipment (bottom). Source: The Shaw Group

freedom of movement has resulted in their primary role being reduced to inspirational leadership, thus significantly reducing the likelihood of a large-scale, coordinated attack in the United States. However, the group continues to draw plans for operations in the U.S. and has maintained a strategic focus on prominent political, economic, and infrastructure targets.

While counterterrorism actions have crippled Al Qa'ida's near-term efforts to coordinate a sophisticated chemical, biological, radiological, and nuclear (CBRN) attack, the U.S. intelligence community suspects that the group is still looking to acquire this capability. In the wake of the 1995 sarin attack on the Tokyo subway and the 2001 anthrax attacks in the U.S., the potential for CBRN weapons to cause widespread casualties and contaminate infrastructure over a large area remains a substantive threat.

Meanwhile, Al Qa'ida affiliates have eclipsed the Al Qa'ida core as the most imminent threat. In Yemen, Al Qa'ida in the Arabian Peninsula (AQAP) has inspired and organized attacks against the U.S. in recent years, as encouraged by their American-born cleric, Anwar al-Awlaqi. These include the November 2009 Fort Hood shooting, the Christmas Day 2009 airline bombing attempt, and the October 2010 printer cartridge bomb in a cargo airplane. AQAP is now heavily targeted by U.S. forces, but they continue to call for domestic terrorist aspirants to conduct attacks in their home country using techniques espoused on the Internet. They discourage these potential terrorists from traveling to

obtain training and weapons, and instead encourage the use of firearms and simpler explosives. From a catastrophe loss perspective, this reduces the resulting threat to events of lower intensity.

Still, the intention remains clear. In 2010, plots were disrupted in Washington, D.C., Oregon, Alaska, and Maryland. Each involved individual initiative, without the participation of foreign groups for fear of discovery. So far, these domestic terrorists have not demonstrated the capability to conduct sophisticated attacks and they are susceptible to discovery when attempting to acquire restricted materials or weapons. They have been subject to tips by informants and stings by undercover agents; however, these individuals have the advantages of free movement, a home base, and the opportunity to operate under the radar.

RECENT OVERSEAS DEVELOPMENTS

Recent political upheaval (the Arab Spring) in countries such as Tunisia, Egypt, Libya, Yemen, Bahrain, Saudi Arabia, and Syria have had both a positive and negative impact on the terrorism threat in the United States; however, these developments were not rooted in terrorism.

Although the situation in each country is different, each is affected by long-term rivalries between factions within that country, including military leaders, tribal groups, and nationalities, many of which are supported by rival regimes in other countries. In the near term, these circumstances are more likely to cause increased civil unrest rather than a more formidable front of terrorist activity aimed against the United States. At the same time, vacuums of leadership could pave the way for terrorist groups to establish a base and obtain new recruits.

The highly symbolic death of Osama bin Laden has disrupted Al Qa-ida's core group; however, jihadists are now extremely vengeful and most experts agree they are likely to seek a large-scale attack. In anticipation of this, the U.S. government has ramped up intelligence efforts. Nevertheless, the concern remains of an increase in attacks, particularly by lone terrorists.

THE IMPACT ON THE INSURANCE INDUSTRY

Prior to September 11, terrorism coverage was available essentially free of charge by virtue of its being included in most standard commercial policies (although nuclear

attacks, which would presumably include radiation pollution from a so-called “dirty bomb,” had always been excluded). Historically, terrorist activity in the U.S. had been of a sufficiently small scale that insurers could treat it as a cost of doing business. Companies had simply not had to pay close attention to their accumulations with respect to terrorism risk.

Before the events of September 11, the largest insured loss in the U.S. and indeed in the world was the approximately \$16 billion loss resulting from Hurricane Andrew in 1992. The bulk of those losses were to property lines. As a result of the events of 9/11, insurers learned the painful lesson that everything can go bad at once. Commercial property, workers’ compensation, life, health, disability, aircraft hull, and general liability lines all suffered catastrophic losses.

The impact of 9/11 on the insurance industry was immediate. Reinsurers either refused to renew coverage or began charging exceedingly high rates. Unable to purchase reinsurance or to otherwise raise sufficient capital, insurers adopted new policy forms with terrorism exclusions. For a time, terrorism coverage was virtually nonexistent. Policyholders were out of luck. At the same time, lenders demanded all-risk coverages to be in place, which increased the potential for major loan defaults and resulted in a massive shutdown of building construction activity.

The U.S. government responded by passing the Terrorism Risk Insurance Act (TRIA) in November 2002, in part to help stabilize the market. TRIA, along with its renewals in 2005 and 2007, established the terrorism risk insurance program (TRIP), which provides, for most commercial lines, government-furnished reinsurance for direct terrorism losses above the insurance company’s deductible, subject to a copayment by the insurer. Initially TRIP only covered acts by international terrorists but was expanded in the latest renewal to cover domestic terrorism as well.

TRIA voided the hastily introduced terrorism exclusions, instituting a mandatory make-available provision. However, TRIP does permit the application of exclusions that had been in place for non-terrorism losses prior to 9/11. Their applicability to terrorism attacks depends on the specifics of the policy language and the details of the attack, which are open to interpretation by the courts after an event occurs.

Overall, commercial property policies vary in the application of exclusions and vary across states. Also, different insurers may implement exclusions with different language and in different combinations. While take-up of terrorism insurance coverage is an option for commercial policyholders under TRIP, certain policyholders receive some coverage even if they decline terrorism coverage. For example, for property coverage, certain states require insurers to cover losses from fire following an event, regardless of the cause of the fire.

The Terrorism Risk Insurance Program Reauthorization Act (TRIPRA), which was passed in late 2007, extended the federal terrorism insurance program for seven years, through 2014. This gave insurers the sense of stability needed for a viable market. Coverage for conventional terrorism has been made available at prices sufficiently reasonable for take-up rates to have grown and stabilized, particularly in areas perceived to be at high risk.

However, this has not been the case for CBRN (chemical, biological, radiological, nuclear) coverage. Coverage for CBRN attacks has remained scant because insurers are simply unwilling to offer it—at least at prices policyholders can afford—given the potential magnitude of the losses. By AIR’s estimate, a single CBRN event in New York could exceed \$750 billion, which would surpass the combined industry surplus of the U.S. property/casualty industry.

The property insurance market has seen an unprecedented number of natural catastrophes in the first half of 2011, and while there is no direct link between terrorism underwriting and natural hazard catastrophe losses, the domino effect of these influences on the market has led to a re-examination of all catastrophe exposures—and especially terrorism insurance portfolios.

According to a recent report issued by Guy Carpenter¹, there is an estimated \$6 billion to \$8 billion of terror reinsurance capacity currently available in the U.S. market—and an over-supply of terrorism reinsurance globally. Today, the overall take-up rates for terrorism insurance among commercial policyholders continues to hover in the range of 60%-65%. While market conditions are stable and are expected to remain so for the foreseeable future, a major loss-causing event could quickly change the dynamics of the market.

MODELING TERRORISM RISK

In the months following the attacks of 2001, considerable discussion took place about how best to prepare for and mitigate future losses from terrorist attacks. What were the chances of another attack? How frequently might they occur and how severe could they be in terms of insured loss?

THE CHALLENGES: SCANT DATA, CORRELATION, AND THE HUMAN ELEMENT

Insurance companies are relatively well-equipped to manage the potential losses associated with claims from individual fires and automobile accidents. There exists a wealth of historical loss data associated with such events that enables actuaries to predict future losses with considerable accuracy. Indeed, insurance markets function well when losses are relatively frequent, relatively small, uncorrelated and random.

Catastrophe losses, almost by definition, meet few of these criteria: they are large, infrequent and highly correlated. Ground shaking caused by earthquakes, for example, can cause building damage over hundreds of square miles, resulting in the simultaneous occurrence of many losses from a single event. On the other hand, natural catastrophes occur, for all intents and purposes, at random and certainly without design.

With respect to natural disasters, catastrophe modelers have in large degree overcome the obstacles to estimating future losses. Estimating losses from terrorist attacks, however, presents a much greater challenge. Historical data on terrorist attacks is much more limited and may not be representative of the current threat. Even more importantly, while scientists and engineers can achieve mastery over the physical science underlying natural catastrophes and their consequences on the built environment, terrorist activity resists scientific quantification. Terrorist attacks are the result of the malicious intent of groups or individuals with varying agendas and with varying capabilities for realizing them. In addition, while natural catastrophe risk remains relatively stationary over time, the terrorist threat is highly dynamic as noted before.

OVERCOMING THE CHALLENGES: THE AIR TERRORISM MODEL

One year after the attacks of September 11, 2001, and at the request of our clients, AIR Worldwide released the first

commercial catastrophe loss estimation model for terrorism. The model estimates the likelihood and financial impact of insured property and workers' compensation losses from future terrorist attacks in the United States.

Where natural catastrophe models are constructed based on decades of (albeit limited) historical data, AIR's terrorism model incorporates the judgment of a team of experts—a "red team"—familiar both with the available historical data and current trends. The red team is comprised of counterterrorism specialists who have decades of experience in government organizations such as the FBI, CIA, Department of Defense, and the Department of Energy. With input from the team, AIR has developed a comprehensive database of potential targets, or landmarks, across the United States (which include many of the same buildings found in the Department of Homeland Security database) and a subset of "trophy targets" that carry a higher probability of attack.

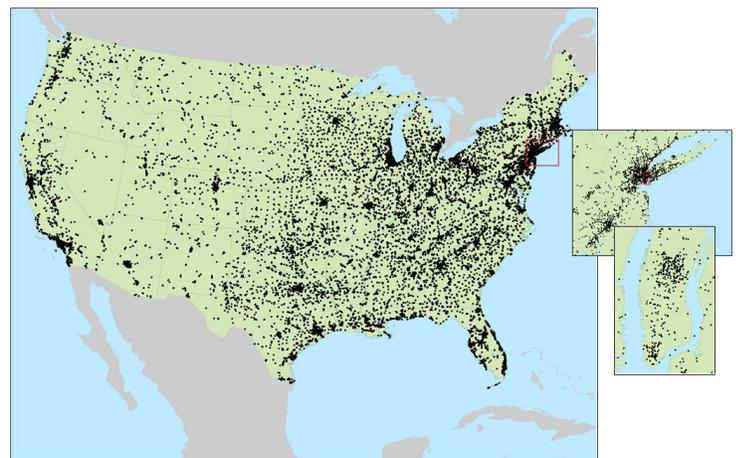


Figure 3. AIR's target/landmark database for the U.S. with detail of the New York City Greater Metropolitan Area. (source: AIR)

Team members use a software tool developed by AIR to perform social network analysis and probabilistic plot analysis of the steps involved in a successful terrorist operation. Social network analysis is highly suitable for analyzing terrorist organizations, as they consist of networks of individuals that span countries, continents, and economic status, and form around a specific ideology. Once the team documents the network, they quantify threats posed by a wide variety of domestic and international terrorist groups, each with its own goals and capabilities.

In addition to using detailed operational threat assessments to determine event frequencies, the model considers damage from a comprehensive array of conventional weapons, including bombs of various sizes, as well as airplane crashes. The model also analyzes the effects of nonconventional weapons, including chemical, biological, radiological, and nuclear. In a probabilistic model, hundreds of thousands of potential scenarios are simulated, representing the complete probability distribution of losses—including losses from the most extreme events that may have no historical precedence.

In an analysis² of 32 terrorism cases against the U.S. homeland since 9/11, approximately 60% of the cases involved explosives and another 30% involved small arms. Of all the target types, government and transportation yielded the highest losses. Over the past ten years, the relative frequencies of different weapons usage, target types and locations as determined by the red team have been in good agreement with actual experience, validating the methodology of the model. Fortunately, many of the actual plots were thwarted.

AIR last updated its terrorism model earlier this year. The persistent trends and significant recent events discussed earlier in this article resulted in a general reduction in estimates of future terrorist operations in the U.S.

CONCLUSION

Looking forward, the future of the federal backstop for terrorism coverage is set to expire in 2014 as the administration considers limiting its exposure as part of deficit-reduction efforts. While the current appetite for terrorism coverage is healthy, many insurers have begun to make longer-term plans for terrorism risk management in the absence of TRIP.

Sophisticated modeling tools will continue to play an increasingly important role in helping companies evaluate and manage their terrorism risk by enabling better risk selection and risk transfer decisions.

The AIR probabilistic approach to catastrophe risk assessment embraces the entire risk landscape by focusing on the likelihood of losses rather than the likelihood of a specific attack on a particular location. This allows risk managers to view a range of high-frequency and low-frequency losses and enables comparisons of alternative underwriting strategies and portfolio constructions to more fully and accurately estimate their exposure to terrorism risk.

¹Terrorism: Terror Market Continues to Provide Abundant Cover

²2010 Analysis from the New York State Intelligence Center

ABOUT AIR WORLDWIDE

AIR Worldwide (AIR) is the scientific leader and most respected provider of risk modeling software and consulting services. AIR founded the catastrophe modeling industry in 1987 and today models the risk from natural catastrophes and terrorism in more than 90 countries. More than 400 insurance, reinsurance, financial, corporate, and government clients rely on AIR software and services for catastrophe risk management, insurance-linked securities, detailed site-specific wind and seismic engineering analyses, agricultural risk management, and property replacement-cost valuation. AIR is a member of the Verisk Insurance Solutions group at Verisk Analytics and is headquartered in Boston with additional offices in North America, Europe, and Asia. For more information, please visit www.air-worldwide.com.