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Five Years After 9/11: How Has Terrorism Risk Management Evolved?

By Jack Seaquist
Senior Manager and Terrorism Model Product Manager
AIR Worldwide Corporation

It has been five years since terrorists attacked the United States, instantly changing the way insurers and reinsurers view catastrophe risk. Since then, terrorism insurance has been one of the most discussed topics in the industry.

With the passage of the Terrorism Risk Insurance Act in 2002 and its extension in 2005, the insurance industry has the protection of the U.S. government in the case of another catastrophic terrorist attack. However, the Act is scheduled to sunset in just over one year, leaving insurers and reinsurers, as well as corporations seeking coverage, in a difficult situation.

With the government backstop in place, it can be argued that the terrorism insurance market has been thriving. Over the past several years, take-up rates have been on a steady increase. It is unclear if this will continue after 2007, particularly in light of the increased exposure to terrorism risk that insurers will face.

The Terrorist Threat

AIR Worldwide (AIR) recently participated in a working group with the American Academy of Actuaries to determine the potential impact of terrorist attacks on the insurance industry. Because terrorists have demonstrated significant expertise with and frequent use of vehicle-based explosive devices and have articulated the clear intent to obtain and use weapons of mass destruction, AIR and the working group analyzed the potential impact of these types of attacks on the insurance industry.

Truck bomb attacks cause property and casualty losses that are proportional to the density of the exposures within the range of the weapon (hundreds of feet). Thus, for the same attack type, a city with a high building density will experience much higher losses than will a more geographically spread-out city.

CNBR (chemical, nuclear, biological, and radiological) weapons have the potential to cause widespread casualties and to contaminate property over very large areas, including entire cities. Such weapons are designed to cause large numbers of fatalities, inflict maximum terror, and damage the economy. Residual effects would likely make rehabilitation of property impossible without very extensive and costly cleanup, as was seen after the anthrax attack conducted through the U.S. mail in 2001, the cleanup costs for which exceeded the structural value of the postal facilities. Many CNBR agents are undetectable until after the attack, excluding the possibility of prior evacuation and making the cleanup job an even more daunting prospect.

AIR's analysis examined three attack modes: a 6-ton truck bomb, a medium CNBR attack using Sarin gas, and large CNBR attack using Anthrax. Each attack mode was modeled for four cities in the United States. The results, which capture the losses across multiple lines of business, are detailed in the chart below.

Scenario	Insured Loss (USD Bn)			
City	New York city	Washington, DC	San Francisco	Des Moines
Large CBRN	768	194	165	41
Medium CBRN	445	105	90	27
Truck Bomb	12	6	9	3

Rating Action

With the potential for such high losses, rating agencies are taking notice and requesting more data on company-specific terrorism exposure. A.M. Best, for example, has requested for the past three years that insurers complete a terrorism Supplemental Rating Questionnaire, or SRQ. This year, S&P also began asking insurers and reinsurers to complete a questionnaire on the topic of terrorism risk management. Both questionnaires require insurers to answer specific questions about their exposure to terrorism risk and to provide estimated potential insured losses resulting from simulated terrorism events.

Terrorism Risk Management Best Practices

In light of the current scrutiny from major rating agencies and potential changes in exposure insurers will face after TRIA's planned expiration, insurers should re-evaluate their own terrorism risk assessment strategies with respect to industry best practices.

Terrorism risk assessment techniques fall into three broad categories: risk within a defined geography, risk in relation to known landmarks or trophy targets, and probability distributions of losses that account for the likelihood of attack. Since most insurers are familiar with geography-based exposure concentration methods, this article will discuss the benefits of landmark-based and probabilistic analyses.

Assessing Terrorism Risk in Relation to Landmarks

Terrorists choose targets that will further their objectives, which may include maximizing economic disruption, causing

mass casualties and disrupting the transport of resources or individuals. One of the critical inputs to effective terrorism risk management is knowledge of where your exposures are with respect to potential terrorist targets.

In August of 2004, the CIA received intelligence pointing to a strong likelihood of attack on five buildings in the New York City and Washington D.C. areas, prompting the government to declare a code red terror alert for those locations. In the crisis of the moment, many insurers had a difficult time identifying their exposures in proximity to these potential targets. On the other hand, those companies that had already captured and analyzed their exposure in relation to a comprehensive list of landmarks were well prepared.

Catastrophe modelers can assist insurers perform these kinds of analyses. AIR, for example, has created a comprehensive database of more than 300,000 potential terrorist targets. The database distinguishes a subset of more than 25,000 targets with a higher than average probability of attack and a smaller list of high profile "trophy targets." The database corresponds closely to critical infrastructure and key assets identified by the Department of Homeland Security and is comprised of more than 25 categories of target, including office buildings, transportation hubs, tourist attractions, energy facilities, and many more.

To identify and quantify exposure based on the potential targets themselves, the following three types of analyses should be undertaken:

Landmark Exposure Analysis
A landmark exposure analysis identifies insured exposure (including occupants) at properties identified as potential terrorist targets. The results of this type of analysis provide a ranked list that identifies the landmarks with the highest exposure, representing the worst-case scenarios for possible targets. This analysis can be performed for specific landmark categories-such as prominent buildings or subway stations-or across multiple landmark categories.

Landmark Ring Concentration
Since exposures in close proximity to the landmark will likely be impacted by an attack, the accumulation of exposure within user-defined rings around the landmark is a useful measure of maximum potential loss.

This measure is limited in that it considers all exposures within the specified ring at their full exposure amount even though buildings and their occupants at some distance may only be minimally affected, while all exposure outside the ring is excluded.

Landmark-based Deterministic Scenarios
A more precise measure of risk can be obtained by estimating the loss from a defined, or deterministic, scenario such as a truck bomb detonated at a particular location. Using a physical damage and injury model, property damage, as well as injuries and fatalities, can be estimated at each location affected by the event. The resulting losses account for weapon characteristics, as well as the construction type and distance of each exposure from the event. It also includes the costs of all injury classes, from minor to fatality, and is not constrained to a single dollar value per exposed life. Deterministic loss analyses can be performed for both conventional and CBRN attacks.

Deterministic scenarios should be analyzed for all landmarks in proximity to the exposures in the portfolio using various weapons types.

Assessing the Probability of Terrorism Loss
In addition to measuring terrorism risk in relation to landmarks, another important terrorism risk management metric is output from a fully probabilistic loss analysis. This is the standard risk management approach for natural catastrophe modeling, which considers both the frequency and severity of possible events. For terrorism, event frequencies are determined through detailed operational threat assessments, taking into account the favored methods and known objectives of terrorist organizations. Based on the simulation of a comprehensive set of possible events, the analysis results provide an indication of loss potential at various levels of probability.

In a probabilistic model, as in deterministic event scenarios, the model should calculate, for each simulated event, damage to all affected properties and injuries to insured individuals, and the costs of each after the application of policy conditions. Probabilistic models simulate the occurrence of hundreds of thousands of potential events, thus providing a robust set of potential outcomes in the coming years.

Looking Ahead
With TRIA's planned expiration at the end of 2007 and the increasing demands rating agencies are putting on insurers regarding terrorism risk assessment, it is imperative that insurers undertake a comprehensive terrorism risk assessment now so they can mitigate potential losses and move toward a more optimal portfolio moving forward.

Fortunately, there are a number of techniques insurers can use to perform robust terrorism risk assessments. Applications such as AIR's CATStation® and CLASIC/2™ are available that enable insurers to examine portfolio locations in relation to potential terrorist targets and perform analyses ranging from single building exposure accumulations to portfolio-level probabilistic loss analyses. These tools and techniques can be used to create a clear picture of a company's overall exposure to risk across their portfolio and are an essential component of a company's overall risk assessment strategy.