



## Fire Following Terrorism: An Approach to Estimating Loss Potential

*Certain SFP states require coverage for fire following an act of terrorism even if terrorism is outright excluded.*

Property loss from fire following terrorism is a highly debated topic in the (re)insurance industry. The industry is faced with uncertainty and challenges on both the coverage front and the loss estimation side. This paper will examine some of those challenges and offer an approach to estimating loss potential. While the contents of this paper are not intended to provide an ultimate solution to these challenges, it will offer guidance by outlining considerations when estimating loss from such an extreme event.

### TRIPRA and SFP Regulation

Congress passed the Terrorism Risk Insurance Act (TRIA) in November 2002 following the September 11th 2001 terrorist attacks. The intent of this act was to address limited availability of terrorism coverage following the attacks and its impacts on the economy. TRIA would act as a federal backstop for acts of terrorism in which the federal government and the insurance industry would share the costs. This act was meant to be a temporary program but has been renewed at expiration each time since inception. Most recently, the act was renewed in January 2015 for six years under the Terrorism Risk Insurance Program Reauthorization Act (TRIPRA).

TRIPRA coverage is only available to commercial insurers and, in exchange for this federal support, insurers are required to offer terrorism coverage. Insureds can choose to reject TRIPRA coverage if they do not want the terrorism coverage; however, their insurers may still be subjected to standard commercial fire policy (SFP) laws in their respective states. There are currently 14 states that do not allow exclusions to the SFP for terrorism; thus, requiring coverage for fire following an act of terrorism even if terrorism alone is outright excluded. These 14 states are listed in the accompanying table. Of these states, four are considered top terror-targeted states and would therefore be more susceptible to the fire following terrorism risk (California, Illinois, Massachusetts and New York). While the underwriting community has observed an increasing demand to explicitly address loss potential from fire following terrorism, lack of historical data for such attacks has made assessing this loss potential ambiguous.

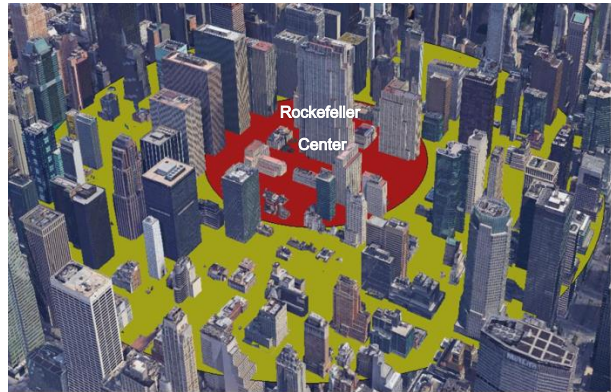
SFP states which do not permit terrorism exclusions:	
California	Missouri
Georgia	New York
Hawaii	North Carolina
Illinois	Oregon
Iowa	Washington
Maine	West Virginia
Massachusetts	Wisconsin

### Quantifying Loss Potential

Unlike with natural catastrophe perils, using catastrophe models to quantify loss potential from terrorism is especially difficult given the inherent complexities of modeling human behavior. Specific to this topic, an added layer of complexity here is that the main vendor models do not explicitly model fire following terrorism on its own.

Even with these limitations, our suggested approach to insurers is still to use catastrophe models (like AIR or RMS) to calculate their exposure accumulations at or around potential terrorism targets and their share of loss after such an attack given the applications of all financial terms. Modeling firms like RMS offer both a deterministic approach (i.e. running a defined attack type at a defined target and ignoring probability of such event happening) and a probabilistic approach (i.e. including attack frequencies). Given the lack of historical terrorism attacks, our suggestion is to focus on a deterministic approach. While there is credibility in the counterterrorism expert's threat assessment work that goes into the probabilistic approach, the ever-changing global terrorism risk landscape renders a static assessment of probabilities less useful. By using this deterministic approach instead, we can remove this uncertainty and focus on our accumulations instead.

With this deterministic approach, our suggestion would be to run ring analyses around various terror targets (e.g. Rockefeller Center) to identify the insured accumulations. A ring analysis works by overlaying concentric rings around a footprint center. With terrorism attack types like a conventional bomb, a ring analysis works by calculating hazard values at various distances from the centroid. As you would expect with such an attack, the hazard values are highest closest to the epicenter and they decrease as the distance from the epicenter increases. In the example shown, concentric rings surround the Rockefeller Center. The 200m radius ring is red, the 500m radius ring is yellow.



Representative image produced by TransRe using Esri's ArcMap software and Google Earth

After calculating the accumulations, we recommend relying on industry experts to develop damage ratios for the concentric rings. One such source is the Lloyd's Realistic Disaster Scenarios<sup>1</sup>. Below are the sample damage ratios for a conventional attack around Midtown Manhattan. Insurers can take the product of these damages ratios and their accumulations to quantify a range of losses for fire following a terrorist attack via a conventional bomb. A similar approach can also be taken for a fire following loss estimate after a nuclear bomb (although in such a case, the ratios for both the property damage and the fire loss will be significantly higher than conventional bomb suggestions below).

Zone	Impact Description	Damage Zone	Property Damage	Fire Loss
1	Collapse and fire following	Inner zone, radius 200m	100.0%	10.0%
2	Massive debris damage to surrounding properties	400m radius	25.0%	2.5%
3	Light debris damage to surrounding properties	500m radius	10.0%	1.0%

For insureds that reject terrorism coverage explicitly, these ring analyses should be performed on all terrorism targets in SFP states which do not permit terrorism exclusions.

## Conclusion

The complexity and dynamic nature of modeling any type of terrorism (especially extreme events such as a nuclear attack) requires a comprehensive solution. Even using this suggested approach, there will be legal complications after any event. How will courts handle the blast-versus-fire debate? There is little precedent (and none for nuclear) on which to base a decision, further convoluting an already ambiguous topic. While the complexity of this risk means that we may never have the fully correct answer, we recommend the approach described here as a starting point to deriving an acceptable range of loss estimates.

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<sup>1</sup> Lloyd's of London, January 2017, "Realistic Disaster Scenarios – Scenario Specifications", p 36-37