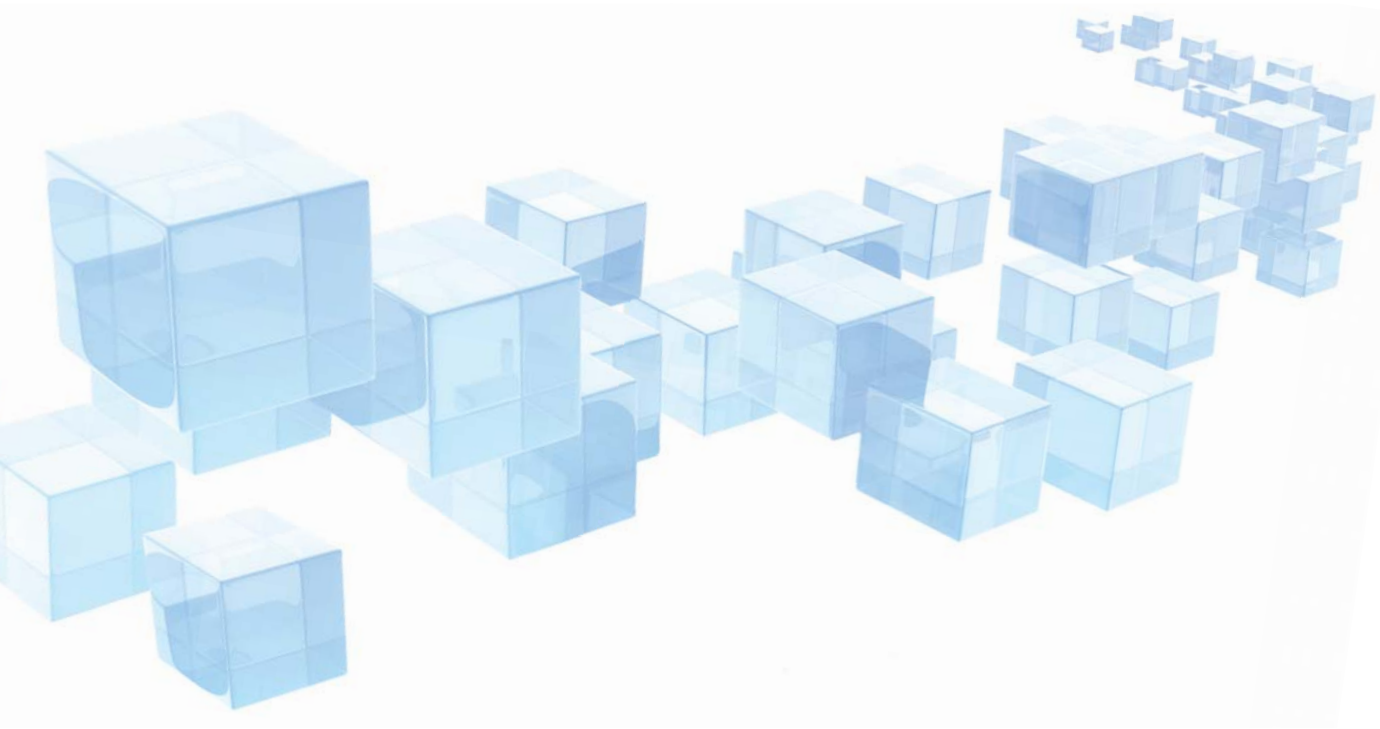


# The Treatment of Terrorism Risk in the Rating Evaluation

October 13, 2017



# The Treatment of Terrorism Risk in the Rating Evaluation

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## Outline

- A. Market Overview
- B. Balance Sheet Strength
- C. Enterprise Risk Management

The following criteria procedure should be read in conjunction with *Best's Credit Rating Methodology (BCRM)* and all other related BCRM-associated criteria procedures. The BCRM provides a comprehensive explanation of A.M. Best Rating Services' rating process.

## A. Market Overview

Terrorist attacks can vary from small, conventional weapons attacks with limited insured losses to full-scale nuclear attacks with devastating impacts on insurers' resources. For exposures located in the United States, the passage of the Terrorism Risk Insurance Program Reauthorization Act of 2015 (TRIPRA) extended the federal backstop six years and temporarily reduced A.M. Best's concerns about the U.S. government's long-term commitment to a federal role. However, since TRIPRA is designed to increase the insurance industry's exposure over time and will expire in December 2020, it is imperative that insurers themselves are properly managing their exposure to terrorism risk.

Moreover, the current version of TRIPRA was approved based upon cost estimates provided by the Congressional Budget Office using expected losses that result in a recoupment of the federal share, making TRIPRA appear to have no impact on the deficit. However, if the actual industry losses are greater than expected and are large enough to prevent any federal recoupment, the Treasury would have to provide as much as \$60 billion in a short time and increase the deficit. Although it is highly unlikely that no payments would be made to insurers, the possibility still exists, and a reduced payment certainly is possible. Furthermore, any lengthy delays in receiving the funds from the Treasury while the government decides on a course of action could cause liquidity problems for the insurer. Thus, although a federal backstop can help reduce the impact of terrorism losses, reliance on such a mechanism cannot replace an insurer's own management of its terrorism risk.

Despite the complexities in identifying, monitoring, quantifying, and managing terrorism risks, A.M. Best believes that any insurer with a material exposure to terrorism risk should be conducting its own terrorism-related stress testing. Additionally, an insurer should be able to quantify the impact an attack could have on its financial position. A.M. Best has also developed terrorism-related stress scenarios that are part of the balance sheet strength assessment. This criteria procedure addresses how A.M. Best uses these scenarios when evaluating an insurer's balance sheet strength. It also gives further guidance on the elements related to terrorism risk management that A.M. Best expects an insurer to incorporate into its enterprise risk management (ERM) program.



# The Treatment of Terrorism Risk in the Rating Evaluation

## B. Balance Sheet Strength

### Primary Insurers and BCAR

For insurers with material exposures to terrorism loss, A.M. Best's key concerns are:

- Aggregate exposure to terrorism
- Number of insured locations
- Geographic concentration of insured exposures
- Impact on capitalization
- Uncertainty surrounding the government's long-term commitment to a federal backstop

Accordingly, A.M. Best adds an amount to required capital in its Best's Capital Adequacy Ratio (BCAR) model that reflects the following:

- Probability of a large-scale attack
- Location of the attack
- Number of large exposure concentrations
- Size of the exposures
- Level of detail in the coding of exposures
- Offsets to the direct loss

These offsets include recoveries from reinsurance and protection from any federal backstops. For U.S. exposures, A.M. Best uses the recovery from TRIPRA. At each confidence interval, the terrorism risk amount is compared with the insurer's natural catastrophe probable maximum loss (PML). The larger of these (at each confidence interval) is added to required capital within the BCAR model as (B8) to calculate the insurer's standard BCAR scores. **Exhibit B.1** details a reasonable guide to standard BCAR scores and their associated assessments.

#### Exhibit B.1: BCAR Assessments

VaR Confidence Level (%)	BCAR	BCAR Assessment
99.6	> 25 at 99.6	Strongest
99.6	> 10 at 99.6 & ≤ 25 at 99.6	Very Strong
99.5	> 0 at 99.5 & ≤ 10 at 99.6	Strong
99	> 0 at 99 & ≤ 0 at 99.5	Adequate
95	> 0 at 95 & ≤ 0 at 99	Weak
95	≤ 0 at 95	Very Weak

# The Treatment of Terrorism Risk in the Rating Evaluation

## **Calculating the Terrorism Risk Amount**

To calculate the terrorism risk amount, A.M. Best assumes a 10% annual probability of a large-scale attack that is at least the size of a five- to six- ton TNT truck bomb and assumes a maximum of only one large-scale attack per year.

A.M. Best has created three tiers that reflect the level of perceived risk of attack for U.S. cities. Tier 1 is composed of five target cities, while Tier 2 has 21 target cities. All other locations are in Tier 3. **Appendix 1** shows the cities in each tier. A.M. Best assigns these tiers the conditional probabilities outlined in **Exhibit B.2**.

### **Exhibit B.2: Conditional Probabilities**

Tier	Conditional Probability
1	60%
2	30%
3	10%
<b>Total</b>	<b>100%</b>

Multiplying the annual probability of a large attack by the conditional probability that the attack occurs in a given tier yields the table of annual probabilities that a large attack will occur in each of the tiers (**Exhibit B.3**).

### **Exhibit B.3: Annual Probabilities**

Tier	Annual Probability
1	6%
2	3%
3	1%
<b>Total</b>	<b>10%</b>

For U.S. companies, using the information gathered in the terrorism section of the Supplemental Rating Questionnaire (SRQ), A.M. Best multiplies the annual probability by the number of exposures greater than 10% of surplus (net of reinsurance and TRIPRA) for each tier, up to a maximum of 100% in any single tier. This calculation reflects the greater risk a company insuring more locations in a given tier undertakes as compared to a company insuring fewer locations in a given tier, as well as the greater risk assumed by a company insuring locations in a higher risk city as compared to a company insuring locations in a lower risk city. A.M. Best does not use the probabilities associated with individual locations provided by the terrorism models, because these extremely low individual location probabilities render expected losses too low to reasonably evaluate an insurer's balance sheet strength.

# The Treatment of Terrorism Risk in the Rating Evaluation

The probability (adjusted for the number and location of exposures) calculated for each tier is then multiplied by the largest exposure (net of reinsurance and TRIPRA) in each tier. For each confidence level, the largest of the three terrorism risk amounts is compared with the natural catastrophe PML. If the terrorism amount is larger, it replaces the natural catastrophe PML (B8) in the standard BCAR.

A sample of this calculation for the standard BCAR for U.S. primary insurers is shown in **Appendix 2**, using the deterministic scenario and modeled loss estimates provided in the SRQ. In this example, the insurer’s largest terrorism risk amount is greater than its natural catastrophe PML at the 95 and 99 confidence levels. However, its terrorism risk amount is less than its natural catastrophe PML at the 99.5 and 99.6 confidence levels. Thus, the terrorism risk amount is used as (B8) at the 95 and 99 confidence levels, while the respective natural catastrophe PML amounts are used at the 99.5 and 99.6. A similar analysis is done for insurers that do not use a terrorism model by using the maximum foreseeable loss (MFL) accumulation responses provided in the SRQ.

This approach takes into consideration the probability of a large-scale attack, the location of the attack, the number of large exposure concentrations, the size of the exposures, the level of detail in the coding of exposures, the offsets to the direct loss, and the importance relative to other potential catastrophes.

### Data Quality Surcharge

During the calculation of the terrorism risk amount, A.M. Best makes an adjustment to the terrorism loss estimates submitted in the SRQ based upon the quality of the data used in the SRQ responses. Data quality is of paramount importance when evaluating the results of any model. A.M. Best adds a surcharge to the loss estimates used in the terror risk amount based upon the level of exposures geocoded to street-address level of detail. The lower the percentage of exposures coded to the street-address level, the higher the surcharge applied to the loss estimates.

The surcharges are shown in **Exhibit B.4** and are applied giving consideration for the company’s deductible and co-participation under TRIPRA.

**Exhibit B.4: Data Quality Surcharges**

% Geocoded to Street Address	Surcharge
<50%	50%
50% - 59%	40%
60% - 69%	30%
70% - 79%	20%
80% - 89%	10%
90% - 100%	0%



## The Treatment of Terrorism Risk in the Rating Evaluation

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Some insurers have made a strong effort to geocode their exposures to street-address level in certain geographic areas that contain their largest exposures, but they have not made the same effort for exposures in other geographic areas. The percentages required for the level of geocoding are on a countrywide basis. To the extent that the insurer can demonstrate there are no large exposure concentrations outside of the rigorously geocoded area, the surcharges can be reduced by the analyst. Insurers then should be prepared to discuss their plans to improve the quality of the data in geographic areas that are missing geocoded addresses, insured values, or employee data, since these missing data could have a negative impact on the rating analysis. For those insurers that do not provide the percentage of exposures geocoded to street-address level, the analysts will apply the maximum surcharge.

### **Stress Approach for Primary Insurers**

This stress test is designed to quantify the impact that a large, insured terrorism loss could have on a primary insurer's capitalization if protection from a federal backstop were not available. Thus, greater emphasis will be placed on the stress test results as the expiration date of the federal backstop approaches. Within the stress test, A.M. Best evaluates the largest exposures individually, using the modeled losses generated from a deterministic scenario. A.M. Best has selected a five- to six-ton TNT truck bomb attack as the scenario to generate the modeled losses at each concentration of exposures.

This attack scenario was selected because of its ability to create an amount of damage and insured losses large enough to stress an insurer's balance sheet. For companies without modeling capabilities, A.M. Best applies a factor to the largest aggregate exposures individually to reflect the extent of expected loss based on whether the location is a single structure, campus-style location, or other type of structure.

The terrorism losses are calculated net of reinsurance only and the resulting amount is reduced for any federal tax impact. Additionally, within the terrorism stress test, the following steps are applied:

1. The reported surplus is reduced by the terrorism net post-tax loss;
2. A minimum of 40% of the pre-tax ceded terrorism losses are added to the existing recoverables on the credit risk page;
3. The risk charges for the recoverables are based upon the reinsurers' current financial strength ratings; and
4. 40% of the net pre-tax terror loss is added to the loss-reserve page. This amount may be adjusted based upon the reinsurance structure.
5. The natural catastrophe per-occurrence all-perils combined net pre-tax PMLs (including reinstatement premiums) are used as an addition to required capital at each confidence level for the (B8) catastrophe risk component.

**Note:** The reduction to surplus in Step 1 is on a post-tax basis only if the analyst believes that the company will be able to utilize the tax benefit. Otherwise the calculation is on a pre-tax basis.

## The Treatment of Terrorism Risk in the Rating Evaluation

The stress BCAR provides a view of the insurer’s capitalization shortly after the terrorism event is assumed to have occurred. The extent of the BCAR’s decline indicates the potential exposure to the insurer’s capitalization if the federal backstop were not available.

Because these adjustments only look at the worst case, A.M. Best also considers how many areas of concentration an insurer has, as well as the geographic locations of these concentrations. Insurance companies with more concentrations in excess of 20% of surplus prior to any recoveries from a federal backstop are at a greater risk than companies with fewer such concentrations. Companies that have large concentrations in high-risk cities also have a greater risk of loss than companies that only write in remote locations. For concentrated companies, A.M. Best has less tolerance for a difference between an insurer’s standard and stress BCAR. As part of the terrorism stress test assessment, all companies are subject to three concentration checks. These checks examine the number of exposures with pre-tax net losses greater than 20% of policyholder surplus (PHS) a company has in specific locations: (1) countrywide, (2) Tier 1 and Tier 2 cities, and (3) Tier 1 cities only. **Exhibit B.5** outlines A.M. Best’s tolerances for the concentration checks. An insurer must pass all three checks in order to be afforded stressed BCAR tolerance.

### Exhibit B.5: Concentration Checks

Countrywide Concentrations	Tier 1 + Tier 2 Concentrations	Tier 1 Only
Fewer than 10 Areas of Concentrated Pre-Tax Net Losses Greater than 20% of PHS	Fewer than 6 Areas of Concentrated Pre-Tax Net Losses Greater than 20% of PHS	Fewer than 3 Areas of Concentrated Pre-Tax Net Losses Greater than 20% of PHS

**Exhibit B.6** describes A.M. Best’s tolerances for a decline in BCAR. A.M. Best only affords the tolerance outlined in **Exhibit B.6** if the insurer under evaluation passes all three of the listed concentration checks and has financial flexibility.

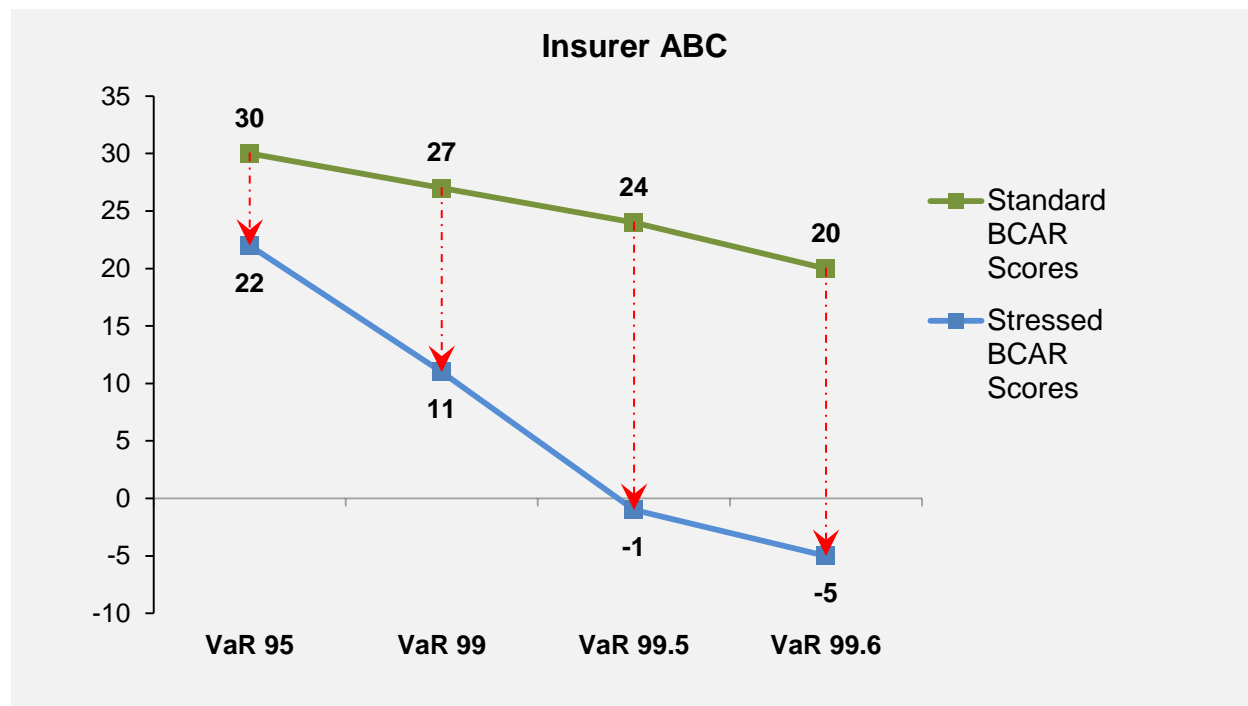
### Exhibit B.6: Terrorism Stress Test Tolerances (Assuming Financial Flexibility)

Passes All Concentration Checks	Standard BCAR Assessment	Stressed BCAR Tolerance	Revised BCAR Assessment
Yes	Strongest > 25 at 99.6	> 0 at 99.5	= Strongest
Yes	Very Strong > 10 at 99.6 & ≤ 25 at 99.6	> 0 at 99	= Very Strong
Yes	Strong > 0 at 99.5 & ≤ 10 at 99.6	> 0 at 95	= Strong
Yes	Adequate > 0 at 99 & ≤ 0 at 99.5	> 0 at 95	= Adequate
Yes	Adequate > 0 at 99 & ≤ 0 at 99.5	≤ 0 at 95	= Weak
Yes	Weak > 0 at 95 & ≤ 0 at 99	≤ 0 at 95	= Very Weak

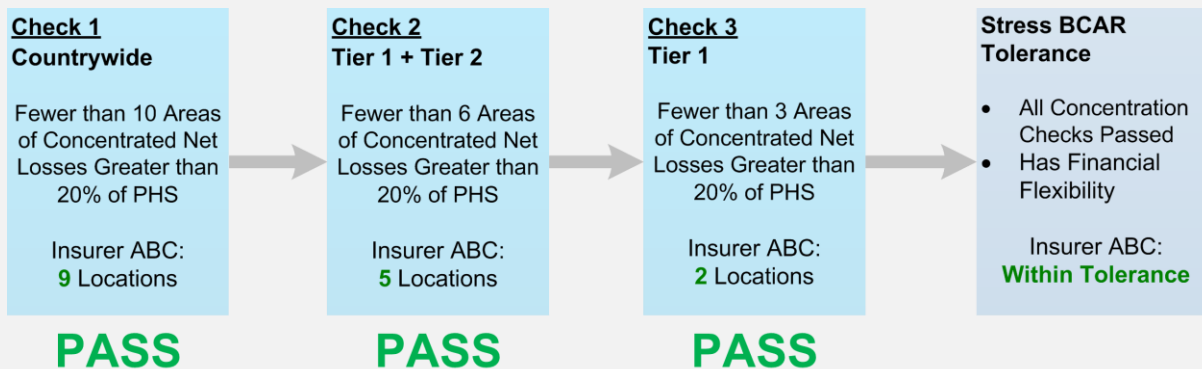


# The Treatment of Terrorism Risk in the Rating Evaluation

Exhibit B.7: Example of Insurer with Financial Flexibility Passing the Terror Stress Test



With a standard BCAR score of 20 at VaR 99.6, Insurer ABC’s standard BCAR assessment is “**Very Strong**.” Its stress BCAR assessment is “**Adequate**” (positive at VaR 99, but negative at VaR 99.5).



ABC passes all three concentration checks. It also has financial flexibility. Therefore, its stress BCAR results are within the tolerance described in Exhibit B.6. Its revised BCAR assessment (“Very Strong”) is the same as its standard.

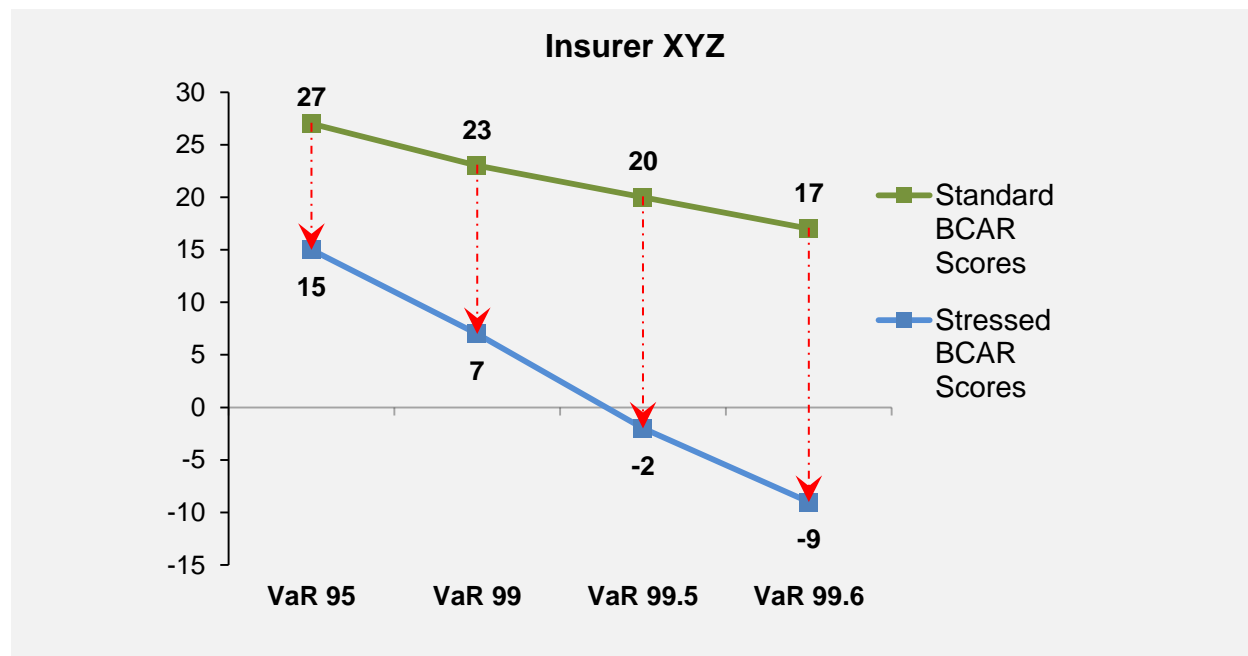
**Insurer ABC’s Revised BCAR Assessment = “Very Strong”**

The revised BCAR assessment of an insurer that fails one of the concentration checks and/or has a stress BCAR outside of the tolerance will generally be lower than that of the standard assessment. Analytical review of the insurer and its specific circumstances will determine the final revised BCAR assessment for such an insurer. Exhibit B.8 shows an example of an insurer failing the stress test.

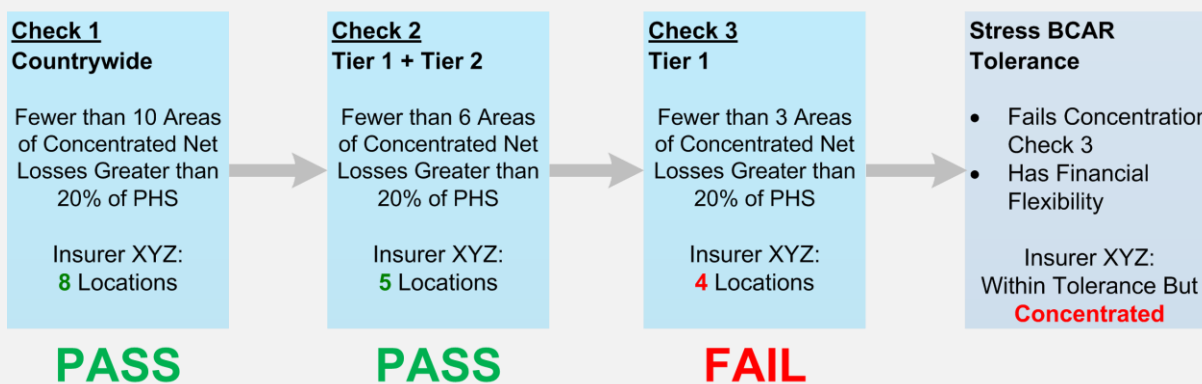


# The Treatment of Terrorism Risk in the Rating Evaluation

Exhibit B.8: Example of Insurer with Financial Flexibility Failing Terror Stress Test



With a standard BCAR score of 17 at VaR 99.6, Insurer XYZ’s standard BCAR assessment is “**Very Strong**.” Its stress BCAR assessment is “**Adequate**” (positive at VaR 99, but negative at VaR 99.5).



XYZ does have financial flexibility, and its stress BCAR results are within the tolerance described in **Exhibit B.6**. However, XYZ is concentrated and failed Check 3. The tolerances in **Exhibit B.6** are generally only extended to insurers that pass the concentration checks. Thus, following analytical review, XYZ’s revised BCAR assessment (“Strong”) is lower than its standard (“Very Strong”).

**Insurer XYZ’s Revised BCAR Assessment = “Strong”**

**Exhibit B.6** assumes that the insurer has the financial flexibility to quickly replace the lost surplus after the event. For those insurers that have limited financial flexibility, the stress BCAR tolerance is reduced as determined by analytical review of the insurer and its specific circumstances. A.M. Best’s

## The Treatment of Terrorism Risk in the Rating Evaluation

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view of an insurer's financial flexibility does take into consideration overall market conditions, which vary over time.

As the expiration of the federal backstop draws near, insurers that fail the stress test will be required to present an action plan detailing the steps the insurer will take to reduce its exposure to terrorism risk in the event that a recovery from the federal backstop is not available.

### **Primary Insurers Not Triggering the Federal Backstop**

A.M. Best is also concerned with the potential scenario that a terrorism loss could occur but fail to trigger a recovery from the current terrorism backstop. The industry loss required to trigger coverage will eventually increase to \$200 million in 2020 (**Appendix 3**). This increasing industry trigger makes the likelihood that an insurer will suffer a loss without any reimbursement from the federal program a much greater concern. This is most likely to impact smaller insurers that provide coverage to businesses located in remote locations, or in locations situated far enough away from other structures that the industry loss is limited to the insurer's loss, and the insurer's loss is less than the industry trigger. Strong terrorism risk management is not limited to just the peak zones, and insurers should not hide behind the theoretically low probabilities of events in remote locations. As with all types of risk, including terrorism, insurers should be managing their exposures down to a reasonable level relative to surplus, avoiding or mitigating any single large exposures.

A primary insurer whose largest net direct exposure is less than the industry trigger but is more than 25% of surplus may be viewed negatively within the balance sheet strength assessment. Insurers should be able to explain any risk mitigation activities in these circumstances.

At many locations, an insurer might provide coverage for one type of potential exposure, whereas the remaining exposures are insured by a separate, unaffiliated insurer. For example, workers' compensation coverage may be provided by one insurer, but the property exposure is protected by an unaffiliated insurer. In addition, some insurers may only offer protection for a portion of the exposure, such as the upper layers of a property exposure. For insurers that are exposed to only one of the many types of coverage at a given location, or that carry only a portion of the total exposure at that location, the insurer must provide evidence that the total industry insured loss at that remote location would exceed the industry trigger to alleviate the concern that the federal backstop would not produce a recovery for the insurer.

### **Professional Reinsurers and BCAR**

Reinsurers with gross aggregate limits for any single zone in excess of 25% of surplus are considered to be materially exposed to terrorism risk. For reinsurers that have a material exposure to terrorism risk, A.M. Best compares the net aggregate limits for the largest concentration within a zone for conventional attacks; the largest net zonal aggregate for chemical, biological, radiological, and nuclear (CBRN) attacks; and the net PML from a natural catastrophe. The largest of these three amounts at each confidence level—after reflecting any reinstatement premiums—is used in the standard BCAR as (B8).

# The Treatment of Terrorism Risk in the Rating Evaluation

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Reinsurers are subject to the same terrorism stress test as primary insurers, but they use the larger of the two terror estimates mentioned above as the losses in steps 1 through 4 of the stress test.

In addition to the stress test, A.M. Best may also discuss the reinsurer's loss retentions net of retrocessions, risk appetite, strategy, underwriting guidelines, and mitigation program, as well as the reinsurer's ability to capture detailed and accurate information related to monitoring and managing the accumulations of risk.

## C. Enterprise Risk Management

### Impact of CBRN and Other Types of Attacks in the Rating Evaluation

Even though A.M. Best has elected to use a five to six ton TNT truck bomb as the modeled attack for the deterministic loss scenario, A.M. Best still expects all insurers and reinsurers with material exposure to terrorism risk to identify, quantify, monitor, and manage their exposure to other types of attacks, both conventional and CBRN. As part of the ERM process, insurers should have a risk catalog of potential terror events and the potential losses created. Composite companies should include their exposures to life and health policies along with their property/casualty exposures when cataloging their potential events and losses. Companies should be willing and able to share these alternative scenarios when discussing their ERM process. A method of accumulating the risks and frequent, systematic reviews of the accumulations and their associated potential losses also are required. Having a risk mitigation plan in place that adequately reduces the insurer's exposure to an acceptable level is imperative. Insurers that do not perform these functions are considered to have weaker ERM than those that do.

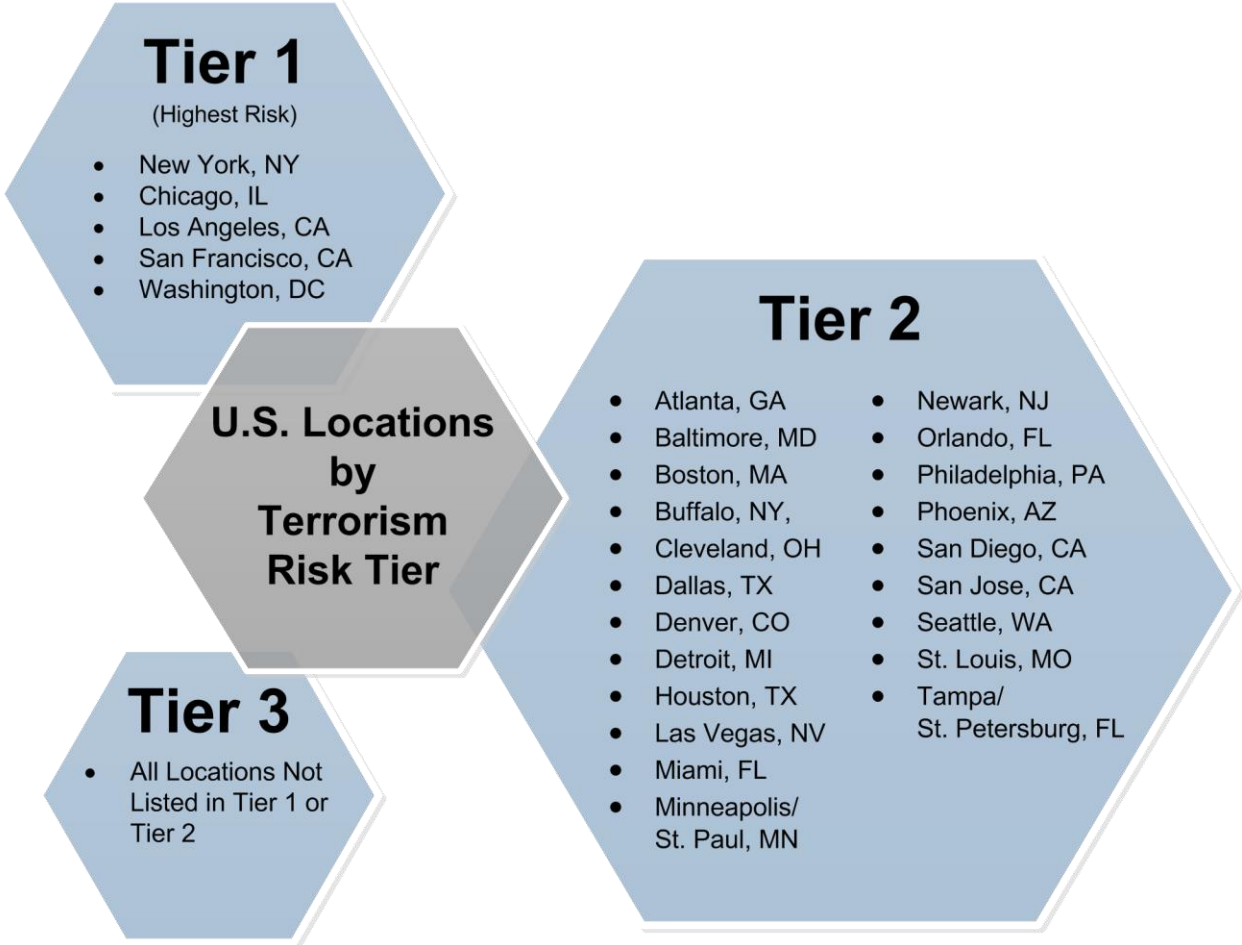
Relying solely on a federal backstop for protection could be problematic, especially for insurers with exposures in the largest cities, where CBRN losses easily could exceed the program cap and limit the actual recoveries. Although the insurer may not be legally obligated to pay claims once the cap is exceeded, the dispute risk could be enormous and costly as policyholders and claimants only receive a partial payment. The best way to avoid this type of potential problem is to enforce sound underwriting guidelines, limit the amount of coverage on a single risk, and prevent geographically concentrated accumulations of those risks.

### Insurer Estimates of Terrorism Loss Amounts

A.M. Best uses an insurer's estimate of its terrorism loss amount to facilitate discussion with the company on the methods it is using to manage terrorism risk. A.M. Best seeks to understand any drivers of differences between a company's modeled losses and the loss estimate by A.M. Best.

# The Treatment of Terrorism Risk in the Rating Evaluation

## Appendix 1: U.S. Locations by Terrorism Risk Tiers



# The Treatment of Terrorism Risk in the Rating Evaluation

## Appendix 2: Sample Calculation of Terrorism Charge Used in BCAR

	A	B	C	D	E	F	G
	TRIPRA Deductible	Largest Net of TRIPRA Exposure	% Geocoded to Street Address	Geocode Surcharge (%)	Surcharge for Exposures Smaller Than Deductible	Surcharge for Exposures Larger Than Deductible	Largest Exposure Adjusted for Geocode % B + E + F
<b>Tier</b>							
<b>1</b>	\$200,000	\$305,000	82.5%	10%	\$0	\$13,900	\$318,900
<b>2</b>	\$200,000	\$260,000	72.5%	20%	\$0	\$18,800	\$278,800
<b>3</b>	\$200,000	\$237,000	62.5%	30%	\$0	\$21,300	\$258,300

	H	I	J	K
	Annual Probability of Large Attack (%)	Conditional Probability of Attack in Tier (%)	Probability for Each Location (%)	# Locations Net of TRIPRA Greater than 10% of PHS
<b>Tier</b>			H * I	
<b>1</b>	10%	60%	6%	3
<b>2</b>	10%	30%	3%	10
<b>3</b>	10%	10%	1%	80

	L	M
	Locations Times Probability (%)	Pretax Terrorism Charge
<b>Tier</b>	J * K	G * L
<b>1</b>	18%	\$57,402
<b>2</b>	30%	\$83,640
<b>3</b>	80%	<b>\$206,640</b>

	N	O	P	Q
	VAR 95	VAR 99	VAR 99.5	VAR 99.6
<b>Maximum Terrorism Charge</b> (Max of Column M)	\$206,640	\$206,640	\$206,640	\$206,640
<b>Natural CAT PML</b> (Pre-tax)	\$100,000	\$175,000	\$210,000	\$275,000
<b>Final PML used in Standard BCAR</b> (Max of Terrorism Charge & NAT CAT PML)	<b>\$206,640</b>	<b>\$206,640</b>	<b>\$210,000</b>	<b>\$275,000</b>

The data for A, B, C, and K is typically collected from the SRQ.  
G is based on insurer co-pay over deductible as percentage of loss from Appendix 3.

## The Treatment of Terrorism Risk in the Rating Evaluation

### Appendix 3: Terrorism Risk Insurance Program Reauthorization Act of 2015

Calendar Year	Insurer's Deductible1 (%)	Insurer's Co-pay2 (%)	Industry Trigger (\$ Millions)	Industry Aggregate Retention (\$ Billions)
2017	20%	17%	\$140	\$34
2018	20%	18%	\$160	\$34
2019	20%	19%	\$180	\$38
2020	20%	20%	\$200	TBD <sup>3</sup>

Footnotes:

- 1 - Expressed as percent of prior year's direct earned premium on TRIPRA covered lines.
- 2 - Expressed as percent of losses above insurer's deductible.
- 3 - To be determined by the Secretary of the Treasury based on a 3-year average of insurer deductibles

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## METHODOLOGY

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