The Cost of Terrorism:

How Much Can We Afford?

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Presentation Outline

• TRIA Background & Update
• Is Terrorism an Insurable Risk—Yet?
  ➢ Determinants of insurability
  ➢ Workers comp-specific problems
• Capacity, Capital & Financial Strength
• The Global Face of Terrorism
• The Market for Terrorism Insurance
• Politicization of the Terrorism Threat
• Q & A
Terrorism Risk Insurance Act (TRIA): UPDATE

- TRIA expires 12/31/05 (enacted Nov. 26, 2002)
- Pan-industry coalition coalescing around a 2-year extension
- House subcommittee hearings held April 28—went well
  - H.B. 4634 introduced in June 2004
  - Passed by subcommittee September 30
- Senate hearings May 18—many committee members amenable BUT seem inclined to wait for Treasury study due June 2005
- Reauthorization opposed by some groups (e.g., CFA, AEI)
- Exclusionary language (except WC) for terror already developed by ISO & approved in 46 jurisdictions
Federal National Security and Counterterrorism Spending

- Federal national security and anti-terror spending increased by 55% between FY2001 and FY2004
- Total Excludes:
  - Billions spent by state and local governments
  - Mitigation costs borne by private industry
  - Cost of terrorism insurance

Source: 9/11 Commission.
Structure of the Terrorism Risk Insurance Program

Max Loss $100

Government recoups payouts below $10B in Year 1, $12.5 Year 2, $15B Year 3 with 3% max surcharge on policy premium.

* Company retention based on direct premiums written.

Insurance Industry Retention Under TRIA ($ Billions)

Above the retention, federal govt. pays 90% and private insurers pay 10%. Govt. caps its losses at $100 billion.

Year 1 (2003) $10.0
Year 2 (2004) $12.5
Year 3 (2005) $15.0
Year 4 (2006) $17.5
Year 5 (2007) $20.0

Source: Insurance Information Institute
ARE WE THERE YET?

THREE YEARS AFTER 9/11, IS TERRORISM AN INSURABLE RISK?
## Terrorism Violates Traditional Requirements for Insurability

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Definition</th>
<th>Violation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Estimable Frequency</strong></td>
<td>• Insurance requires large number of observations to develop predictive rate-making models (an actuarial concept known as credibility)</td>
<td>• Very few data points&lt;br&gt;• Terror modeling still in infancy, untested.&lt;br&gt;• US intelligence infrastructure deeply flawed</td>
</tr>
<tr>
<td><strong>Estimable Severity</strong></td>
<td>• Maximum possible/probable loss must be at least estimable in order to minimize “risk of ruin” (insurer cannot run an unreasonable risk of insolvency though assumption of the risk)</td>
<td>• Potential loss is virtually unbounded.&lt;br&gt;• Losses can easily exceed insurer capital resources for paying claims.&lt;br&gt;• Extreme risk in workers compensation and statute forbids exclusions.</td>
</tr>
</tbody>
</table>

Source: Insurance Information Institute
# Terrorism Violates Traditional Requirements for Insurability (cont’d)

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<th>Definition</th>
<th>Violation</th>
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</thead>
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<tr>
<td><strong>Diversifiable Risk</strong></td>
<td>• Must be able to spread/distribute risk across large number of risks</td>
<td>• Losses likely highly concentrated geographically or by industry (e.g., WTC, power plants)</td>
</tr>
<tr>
<td></td>
<td>• “Law of Large Numbers” helps makes losses manageable and less volatile</td>
<td>• Take-up rate low outside most at-risk zones/industries leads to <em>adverse selection</em> problem</td>
</tr>
<tr>
<td><strong>Random Loss Distribution/Fortuity</strong></td>
<td>• Probability of loss occurring must be purely random and fortuitous</td>
<td>• Terrorism attacks are planned, coordinated and deliberate acts of destruction</td>
</tr>
<tr>
<td></td>
<td>• Events are individually unpredictable in terms of time, location and magnitude</td>
<td>• Dynamic target shifting from “hardened targets” to “soft targets”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Terrorist adjust tactics to circumvent new security measures</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Actions of US and foreign governments may affect likelihood, nature and timing of attack</td>
</tr>
</tbody>
</table>

Source: Insurance Information Institute
Modeling Severity & Frequency

Exposure
- Location
- # & Type Employee

Weapons Selection
- Blast/Explosion
- Chemical
- Biological
- Radiological
- Other (e.g., Dam Failure)

Casualty Footprint
- Physical distribution of intensity of event

Frequency
- Weapon availability
- Target attractiveness
- Relative attractiveness of region

State-by-State Analysis

Targets
- Type of structure/facility

Sources: Insurance Information Institute based on NCCI Item Filing B-1383 & EQECAT modeling.
Additional Insurability Concerns

- Information Problems:
  - Traditional Insurance assumes that emerging issue information is available and shared (Terrorism information sharing is “asymmetric” – Classified data is not shared).

- Unique Role & Responsibility of Government:
  - Insurance is designed for policyholders’ insurable interests (Victims of terrorism are mostly surrogate targets for attacks mainly aimed at government, and the government is in a unique position to influence the likelihood of attack based upon foreign policy.)

Source (this slide and next three): Terrorism, TRIA, and a Timeline to Market Turmoil? by James Macdonald of ACE USA, presentation before the Real Estate Roundtable, April 22, 2004.
Surplus Impairment Risk:

Statutory Accounting requires insurers to set aside reserves for the ultimate liabilities arising from the insurance policies they underwrite. (Insurers are not allowed to post reserves for losses that have not occurred. Therefore, insurers are not allowed to post reserves specifically related to catastrophe losses from natural perils or terrorism until they actually occur. As a result, catastrophe losses deplete insurer’s capital & surplus base intended for the security of all policyholders).

Pre-Loss Funding:

Almost all insurance assumes that premiums are paid first, normally at the inception of the policy. (In terrorism programs or pools, private and public sector solutions, such as TRIA, often use a combination of pre-loss and post-loss funding.)
**Terrorism & Workers Comp: Unique Insurability Problems**

- **Unlimited risk-of-ruin due to uncapped medical obligations and lifetime income payments**
  - 9/11 transformed many WC underwriting decisions into capital management decisions.

- **WC insurers cannot exclude terrorism in any state. WC “take-up” ratio = 100%**
  - With the exception of PA state WC laws do not even permit exclusion of war.

- **Traditional statewide rating approach is completely unsuitable for pricing terrorism**
  - Office worker in Times Square = Same premium as office worker in Rochester? *Also:* Lowest rated classes present disproportionate risk to terrorist loss (assuming an attack similar to 9/11): office, secretarial (8810).
New Exposure Basis:
- Employees by location – not yet formally embraced by rating agencies – new underwriting & exposure management systems now required.

Catastrophe Reinsurance:
- Prior to 9/11, life insurers provided low-cost WC reinsurance over single event insurer retentions of $10 million or less – with no Terrorism or NRBC exclusion. New Bermuda capacity has not replaced the life reinsurers, who exited market after 9/11. No NRBC is available to today for national account insurers.

CAPITAL, CAPACITY & PERFORMANCE

CAN INSURERS AFFORD ANOTHER MAJOR TERRORIST ATTACK?
Sept. 11 Industry Loss Estimates
($ Billions)

Life
$1.0 (3.1%)

Aviation Liability
$3.5 (10.8%)

Property - WTC 1 & 2
$3.6 (11.1%)

Other Liability
$4.0 (12.3%)

Property - Other
$6.0 (19.5%)

Aviation Hull
$0.5 (1.5%)

Event Cancellation
$1.0 (3.1%)

Workers Comp
$1.8 (5.8%)

Biz Interruption
$11.0 (33.8%)

Current Insured Losses Estimate: $32.5B

Source: Insurance Information Institute
## Death Toll from September 11, 2001 Terrorist Attack

<table>
<thead>
<tr>
<th>EVENT</th>
<th>DEATHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>WTC victims (workers &amp; visitors)*</td>
<td>2,605</td>
</tr>
<tr>
<td>WTC hijacked jets (incl. 10 hijackers)</td>
<td>157</td>
</tr>
<tr>
<td>Pentagon victims on the ground</td>
<td>125</td>
</tr>
<tr>
<td>Pentagon hijacked jet (incl. 5 hijackers)</td>
<td>64</td>
</tr>
<tr>
<td>Pennsylvania jet crash (incl. 4 hijackers)</td>
<td>44</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>2,995</strong></td>
</tr>
</tbody>
</table>

Source: *New York City Medical Examiner estimate of 2,752 (as of 29 Oct. 2003), less 147 killed on hijacked jets.

<table>
<thead>
<tr>
<th>Event</th>
<th>Loss ($ Billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Euro. Storms/Floods (1997)</td>
<td>$4.9</td>
</tr>
<tr>
<td>Hurricane Jeanne (2004)*</td>
<td>$6.0</td>
</tr>
<tr>
<td>Hurricane Hugo (1989)</td>
<td>$6.2</td>
</tr>
<tr>
<td>Windstorm Lothar (1999)</td>
<td>$6.4</td>
</tr>
<tr>
<td>Windstorm Daria (1990)</td>
<td>$6.4</td>
</tr>
<tr>
<td>Hurricane Charley (2004)*</td>
<td>$6.8</td>
</tr>
<tr>
<td>Typhoon Mireille (1991)</td>
<td>$7.6</td>
</tr>
<tr>
<td>Northridge Earthquake (1994)</td>
<td>$17.3</td>
</tr>
<tr>
<td>Hurricane Andrew (1992)</td>
<td>$20.9</td>
</tr>
<tr>
<td>Sept. 11 Terror Attack (2001)</td>
<td>$32.5</td>
</tr>
</tbody>
</table>

Insured Loss Estimates
(As of September 13, 2002)

Top 20 Groups (pre-tax, net of reinsurance, $ millions)

NOTES:
*Includes $474 mil for American Re
**Includes $289 mil for Converium
***Insurer is bankrupt

Source: Morgan Stanley, Insurance Information Institute as of September 13, 2002.
Top 5 Costliest Terrorist Attacks
(by insured property loss*)

$ Millions, Adjusted to 2001 Price Level

- **$32,500**
  - **9/11/01**
    - 2,995 Killed
    - 2,250 Injured

- **$907**
  - **4/24/93**
    - 1 Killed
    - 54 Injured

- **$744**
  - **6/15/96**
    - 0 Killed
    - 228 Injured

- **$725**
  - **2/26/93**
    - 6 Killed
    - 725 Injured

- **$671**
  - **4/10/92**
    - 3 Killed
    - 91 Injured

Oklahoma City bombing in 1995 cost insurers $125 million

9/11 Terrorist Attacks
Bomb Near NatWest Tower in London
IRA Car Bomb Near Manchester Mall
Bomb in WTC Garage
Bomb in London Financial District

*Includes property, business interruption and aviation hull losses.
Source: Swiss Re; Insurance Information Institute.
Under Most Scenarios TRIA Is Dormant But Vital When Triggered

P&C U/W Loss With and Without TRIA Support

Total loss as % of policyholder surplus

TRIA not triggered under approximately 98% of scenarios

Source: EQECAT, NCCI
Percent of 2003 Surplus Lost Due to a $25 Billion Terrorism Attack in 2004 With TRIA in Place

Top 10 US P/C Insurers by Market Share

Even with TRIA in place, some major insurers will lose more than 10% of their policyholder surplus: Terrorism is a clear threat to stability.

Estimated Workers Comp Insured Losses & Deaths for Terrorist Events

Fatalities

WC Losses ($ Billions)

$100
$90
$80
$70
$60
$50
$40
$30
$20
$10
$0

$173,000

Source: Eqecat, NCCI.
Port Security War Game Estimates $58B Impact from Simulated Terrorist Attack

U.S. Policyholder Surplus: 1975-2003

Surplus (capacity) peaked at $339.3 Billion in mid-1999 and fell by 15.9% ($53.9 billion) to $285.4 billion at year-end 2002.

Capacity at year end 2003 was just 2.3% above its mid-1999 peak.

“Surplus” is a measure of underwriting capacity. It is analogous to “Owners Equity” or “Net Worth” in non-insurance organizations.

Source: A.M. Best, ISO, Insurance Information Institute
Capital Myth: US P/C Insurers Have $350 Billion to Pay Terrorism Claims

Total PHS = $298.2 B as of 6/30/01
= $291.1 B as of 12/31/02
= $347.0 B as of 12/31/03

"Target" Commercial* $114 billion
33%

Personal $146 billion
42%

Commercial Reserve Deficiency $30 billion (est.) 9%

Other Commercial $58 billion 17%

Only 33% of surplus backs "target" lines net of reserve deficiency

"Target" Commercial includes: Comm property, liability and workers comp; Surplus must also back-up on non-terrorist related property/liability and WC claims
Source: Insurance Information Institute estimates based on A.M. Best Q.A.R Data.
US Reinsurers: Change in Policyholder Surplus ($ Billions)


Source: A.M. Best; Insurance Information Institute
2004 could become the second worst year ever for natural disaster losses in the US

*2004 figure is 2004 estimate as of September 20, 2004.

Note: 2001 figure includes $20.3B for 9/11 losses reported through 12/31/01. Includes only business and personal property claims, business interruption and auto claims.
Source: Property Claims Service/ISO; Insurance Information Institute
In 2001 insurers paid out $52 billion more in loss and associated expenses than they earned in premiums.
US P/C insurers missed their cost of capital by an average 6.4 points from 1991 to 2003

Source: The Geneva Association, Insurance Information Institute
The non-life insurance industry achieved its costs of capital in 2004 for the first time in many years.

US P/C insurers missed their cost of capital by an average 6.5 points from 1991 to 2003.

Insurer Downgrade/Upgrade Ratio*


*U.S. property/casualty and life/health insurers
P/C Company Insolvency Rates: 1993 to 2002

Source: A.M. Best; Insurance Information Institute

1993: 1.20%
1994: 0.58%
1995: 0.21%
1996: 0.28%
1997: 0.79%
1998: 0.60%
1999: 0.23%
2000: 1.02%
2001: 1.03%
2002: 1.33%

10-yr Failure Rate = 0.72%
PRICING ENVIRONMENT PRE/POST 9/11

CAN BUYERS OF INSURANCE AFFORD ANOTHER MAJOR TERRORIST ATTACK?
* Cost of risk includes insurance premiums, retained losses and administrative expenses

Source: 2003 RIMS Benchmark Survey; Insurance Information Institute
Components of Cost of Risk Per $1,000 of Revenue*

% Change 2001 -03

+45.8%  +90.3%  +113.8%

% Change

$4.0  $3.5  $3.0  $2.5  $2.0  $1.5  $1.0  $0.5  $0.0

$2.49  $2.92  $3.63  $3.54  $3.57

$1.86  $2.72  $2.55  $1.67  $1.43  $2.07  $1.00  $1.00  $1.43  $1.86  $1.26  $1.26  $1.15  $1.15

* Cost of risk includes insurance premiums, retained losses and administrative expenses

Source: 2003 RIMS Benchmark Survey; Insurance Information Institute
Commercial Premium Rate Changes Are Sharply Lower

Is moderation due to realization of performance and profit goals, increasing capacity/capital, or market-share strategies?

Source: MarketScout.com
Reinsurance prices rising, limits falling: ROL up significantly, though not as much as after Hurricane Andrew in 1992.

Source: Guy Carpenter
THE GLOBAL FACE OF TERRORISM:

MOST MAJOR ECONOMIES HAVE CREATED PERMANENT GOVERNMENT-BACKED TERRORISM INSURANCE FUNDS
## Governments Insuring Terror Risk

### Government Backed Terrorism Insurance Programs

<table>
<thead>
<tr>
<th>Country</th>
<th>Provider</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>United Kingdom</td>
<td>Pool Re</td>
<td>Created in 1990’s due to IRA terrorism losses.</td>
</tr>
<tr>
<td>Spain</td>
<td>Consorcio</td>
<td>Covers “Extraordinary Risks” such as Earthquake, Volcanic Eruption, Flood, Storm, Terrorism and Civil Commotion</td>
</tr>
<tr>
<td>South Africa</td>
<td>SASRIA</td>
<td>Created in 1929 due to political climate in South Africa - still in existence today.</td>
</tr>
<tr>
<td>Israel</td>
<td>PTCF</td>
<td>Covers losses triggered by politically motivated violence (including terrorism).</td>
</tr>
<tr>
<td>France</td>
<td>GAREAT</td>
<td>Created post September 11, pool with state guarantee for terrorism coverage.</td>
</tr>
<tr>
<td>Germany</td>
<td>Extremos</td>
<td>Created post September 11, pool with state guarantee for terrorism coverage</td>
</tr>
<tr>
<td>Australia</td>
<td></td>
<td>Created in November 2002</td>
</tr>
</tbody>
</table>

*Source: Swiss Re Focus Report: Terrorism*
In 2003, there were 208 terrorist attacks resulting in 625 deaths and 3,646 injuries.
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International Terrorist Attacks by Type of Event, 2003

Source: Patterns of Global Terrorism, US Department of State; Insurance Information Institute

Bombings accounted for 57% of the 208 attacks in 2003, while armed attacks accounted for 24%.
Attacks on businesses accounted for 30% of the 201 terror attacks against facilities in 2003, while attacks against govt. facilities accounted for 8%,
International Terrorist Attacks by Casualty, 2003*

Terrorist attacks killed more civilians than any other group (90% of the 4,271 casualties), followed by military personnel (1%) in 2003. Business personnel accounted for 0.7% of casualties (despite 30% of attacks being against business facilities).

*Total of 4,271 casualties consists of 625 deaths and 3,646 injuries.
Source: Patterns of Global Terrorism, US Department of State; Insurance Information Institute
The Market for Terrorism Coverage
Terrorism Coverage
Take-Up Rate Rising

Terrorism take-up rate for non-WC risk rose through 2003 and continues to rise in 2004.

Source: Marsh, Inc.; Insurance Information Institute

TAKE UP RATE FOR WC COMP TERROR COVERAGE IS 100%!!


23.5% 26.0% 32.7% 44.2% 46.2%
Terrorism Coverage:
Take-Up Rates by Region

Terrorism take-up rate is highest in the Northeast

<table>
<thead>
<tr>
<th>Region</th>
<th>Take-Up Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northeast</td>
<td>30.3%</td>
</tr>
<tr>
<td>Midwest</td>
<td>26.2%</td>
</tr>
<tr>
<td>South</td>
<td>21.8%</td>
</tr>
<tr>
<td>West</td>
<td>18.6%</td>
</tr>
</tbody>
</table>

Source: Marsh, Inc.; Insurance Information Institute
Terrorism Coverage: Take-Up Rates by Industry

Given the choice, what percentage of employers would forego WC terror coverage?

Source: Marsh, Inc.
Increase reflects fall in price of property coverage rather than increase in price of terror coverage.

FACTs on Terror Premium Relative to Property Premium

Highest = Energy Industry = 8.03%
Lowest = Construction = 2.36%

Source: Marsh, Inc.; Insurance Information Institute
Terrorism Premium as Percentage of Property Premium, by Industry

- Energy: 8.03%
- Habitational/Hospitality: 7.65%
- Media: 6.07%
- Real Estate: 5.09%
- Utility: 4.94%
- Education: 4.76%
- Transportation: 4.76%
- Food & Beverage: 4.69%
- Public Entity: 4.20%
- Technology/Telecom: 4.02%
- Retail: 3.75%
- Financial Institutions: 3.56%
- Healthcare: 3.31%
- Manufacturing: 3.10%
- Construction: 2.36%

Source: Marsh, Inc.
THE POLITICIZATION OF TERRORISM
If They Don’t Know, Insurers Can’t Presume to Know Either
They’re Here and Plans are “90% Complete” to Attack

- Most major government officials believe another attack is imminent
- Terrorists’ plans are 90% complete for next attack
- Government has no idea of how, when, where, who or what kind of attack is next.
Ability of Terrorism to Affect Political Outcomes Also Suggests Terrorism Uninsurable

- March 11 Madrid bombings taught us that terrorism can be used to not only kill people and destroy property, but affect political outcomes
- American actions abroad likely influence likelihood of attack in US. [e.g., Is Iraq an al Qaeda recruiting tool?]
- Both seem to be inconsistent with insurability
Number of Chemical Plants that Could Threaten Nearby People

- **7,728** threatens more than 1,000 people
- **4,391** threatens more than 1,000,000 people

**EPA**

**Homeland Security**

**DHS estimate is 43% less than EPA**

**DHS estimate is 98% less than EPA**

How is it that the EPA DHS come to such radically different conclusions?

Summary

- Large scale attacks still not insurable even 3 years after 9/11
- Too many solvency-threatenning scenarios
- Workers Compensation has many unique problems and take-up rate is 100%; No exclusions allowed
- Politicization of terror risk makes insuring against terror even more problematic
- Timely TRIA renewal in jeopardy
If you would like a copy of this presentation, please give me your business card with e-mail address