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GC Briefing
An update from the Casualty Specialty Practice

August 2008

Casualty Cat Unveils Hidden Risks in Your Portfolio

Casualty risk is rarely linear. A single event could affect many insureds across several lines of business, triggering disproportionate payouts, depleting balance sheets, and possibly threatening solvency. While carriers have been aware of the domino effect that could follow a casualty event, a realistic approach to risk mitigation has been elusive. Sufficient data and modeling capabilities traditionally have been in short supply. Fortunately, there is a new way to manage this threat. Guy Carpenter & Company, LLC's ("Guy Carpenter's") Casualty Cat Model, developed jointly with Arium, Ltd., makes it possible to track "hidden" exposures throughout your portfolio and develop a plan for protecting your capital.

The Problem

Most (re)insurers address specific casualty risks adequately. Using historical event data, they anticipate certain levels of loss and subsequently transfer the appropriate amount of risk. But, not all risks are specific, and past events don't always suggest what the future holds. An increasingly global business community – even for small, regional companies – and the growing complexity of casualty carriers' insurance supply chains have rendered targeted risk management practices ineffective for the webs of liability that have emerged.

One event could trigger a chain reaction of losses throughout a casualty insurer's portfolio, affecting multiple lines of business for many insureds. Some of the resulting claims may seem unrelated at first – such as product liability and professional liability – but they ultimately could be tracked back to the same cause. Traditional risk management techniques may miss these costly exposures.

Casualty catastrophe risks are hardly new. Property-catastrophe (re)insurers have been addressing this risk for years. Of course, their efforts have been aided by plentiful historical data, not to mention the role of location in determining and managing risk. Property-catastrophe clash focuses on a specific place, such as a building or neighborhood.

Unlike property-catastrophe risks, though, casualty catastrophe risk, on the other hand, is more nebulous. There is often no geographical reference with which to anchor risk management strategies, and the implications may be felt around the world. A single event could occur regardless of location and have worldwide implications. Further, casualty risks are unlikely to repeat themselves, as opposed to property-catastrophe perils (e.g., hurricanes), which tend to recur in similar patterns. Florida will always be exposed to hurricanes (at least for the foreseeable future). Enron, however, is probably not going to cause another wave of class actions through energy market manipulation and off-balance sheet transactions.

Until recently, it has been almost impossible to manage casualty catastrophe risk effectively. Carriers have not had access to sufficient data, and modeling capabilities had not kept pace with the complexity and multiplicity of perils. This is changing. A new generation of tools has been developed to track the diffuse implications of casualty perils throughout a carrier's portfolio.

Mitigating Interconnected Risk

For casualty (re)insurers, risks are intertwined. A single event – from a product recall to a substantial, rapid decline in stock price – could lead to lawsuits and claims across several lines, with a higher number of potential claimants. The ultimate result could be a casualty catastrophe that bleeds balance sheets with unanticipated ferocity.

Risk mitigation is difficult under these circumstances. Carriers tend to have plans for particular lines of business, but they are rarely integrated sufficiently. Cover for a specific D&O peril, for example, may not account for ancillary D&O effects from an event elsewhere in the portfolio … not to mention the E&O implications. In the event of a casualty catastrophe, it is not enough to model these scenarios separately and aggregate the results. The whole may be greater than the sum of the parts. Instead, catastrophe risks must be identified, accumulated, and modeled holistically in order for their implications to be understood and hedged.

Understanding Casualty Catastrophe Risk

1. Locate areas of vulnerability to catastrophe risk in a portfolio
2. Identify casualty catastrophe mechanisms and determine how they operate within a portfolio
3. Model the major event scenarios that could trigger substantial casualty losses
4. Formulate a risk management plan that addresses the full reach of each scenario identified

Ultimately, identifying and remedying casualty catastrophe risk requires a systematic approach. The various connections within a portfolio must be scoured in order to understand the implications of a particular event. A product recall could lead to product liability, D&O, and E&O claims. A plane crash due to equipment malfunction could cause claims for product liability, D&O, and life to be filed. Likewise, an industrial accident causing workers compensation or employers liability losses could lead to general liability, environmental, and D&O claims.

The implications of a particular situation can reach far beyond the root cause, even if it stretches the imagination. Think about the events surrounding the collapse of Enron, which destroyed considerable shareholder wealth, changed Wall Street's research culture, and decimated accounting and consulting firm Arthur Anderson, LLP.

Casualty Cat Unearths Hidden Risks

Guy Carpenter's Casualty Cat facilitates the study of single- and multi-peril casualty catastrophe risks in an insurer's broader risk management plan. Through a rigorous analysis of inter-industry trading and supply chain data, carriers can assess key vulnerabilities, providing a foundation for risk transfer planning and execution.

In order to address the interconnected nature of casualty catastrophes, Casualty Cat measures risk and impact by proximity to cause. Based on the spread of an event's implications across industry and coverage lines, a risk accumulation profile is developed, showing a portfolio's exposures and providing a starting point for risk mitigation planning.

Through the use of techniques grounded in network theory, Casualty Cat maps various scenario outcomes throughout a carrier's portfolio by highlighting the links among the insureds. Carriers can use metrics (e.g., the insureds' policy limits and premiums) to estimate losses, assess relative vulnerabilities, and assign risk loads – along with other portfolio management tasks. No longer concealed, casualty catastrophe risks become knowable and therefore manageable. Casualty Cat enables risk-bearers to take action.

Case Study

Consider hypothetical commercial property construction and development company "X," which has several high-profile commercial office projects around the world. In this scenario, the company was found to have massively overestimated both development costs (due in part to negligent risk management advice received from the insurer's environmental audit team) and projected occupancy rental returns at two important commercial office sites in a major city (e.g., London, New York, Dubai, or Shanghai).

> "No longer concealed, casualty catastrophe risks become knowable and therefore manageable. Casualty Cat enables risk-bearers to take action."

Company X failed to make provisions for inaccurate cost estimates and expected returns on its balance sheet, creating a financial "black hole" that the company's auditors missed. Company X made misleading representations to property investment funds. It raised capital from banks using an overly optimistic analysis of expected financial returns based on the advice of real estate intermediaries. This has led to a D&O class action against company X by its U.S. shareholders, and the company has had to file for bankruptcy.

While the situation has already become precarious, this is only the first link in the causal chain of exposure, and the contagion spreads quickly. Businesses that provide services to company X – such as quantity surveying, prospectus marketing, legal advisory, accounting, and software design – could become entangled in litigation. Their insurers could have to pay claims later as a result, because their insureds are proven by litigators to have had a role to play in the chain of responsibility, however remote, for company X's collapse.

The attorneys and accountants advising the commercial property construction and development company on its transactions could become defendants, as well, not to mention the consulting firms that helped set the strategy underlying the failed projects and the investment bankers involved in underwriting them. Even the software development firm is at risk, as it may have misrepresented the nature of the payments made via the accounting software. The insurers providing cover for the project could have E&O exposure in relation to the negligent insurance and environmental risk management advice provided.

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Thus, one event, centered on a single company's actions, could have profound consequences for several carriers and reinsurers. In addition to direct risk for the carrier providing E&O cover for the project, insurers writing D&O policies for the companies involved (however tangentially) could wind up paying substantial claims. Eventually, this exposure flows up to reinsurers, resulting in considerable financial damage along the way.

Potentially Affected Industries (by NAICS*)

Industry Code	Description
23332	Commercial and Institutional Building Construction
5221	Depository Credit Intermediation
52231	Mortgage and Non-mortgage Loan Brokers
52391	Miscellaneous Intermediation
52393	Investment Advice
5241	Insurance Carriers
524126	Direct Property and Casualty Insurance Carriers
5259	Other Investment Pools and Funds
52593	Real Estate Investment Trusts
531	Real Estate
53112	Lessors of Non-residential Buildings (except Mini-warehouses)
53121	Offices of Real Estate Agents and Brokers
5313	Activities Related to Real Estate
53131	Real Estate Property Managers
531311	Residential Property Managers
531312	Non-residential Property Managers
53132	Offices of Real Estate Appraisers
53139	Other Activities Related to Real Estate
54111	Offices of Lawyers
541199	All Other Legal Services
54121	Accounting, Tax Preparation, Bookkeeping, and Payroll Services
541211	Offices of Certified Public Accountants
54151	Computer Systems Design and Related Services
541512	Computer Systems Design Services
5416	Management, Scientific, and Technical Consulting Services
54199	All Other Professional, Scientific, and Technical Services

Source: Guy Carpenter & Company, LLC
**North American Industry Classification System*

Using the network diagram generated by Casualty Cat, a roadmap of risk highlights the implications of the property developer's black hole. Company "X" is in the center of the map (in this case represented by NAICS code 23332), with direct exposures radiating from it by industry (e.g., NAICS code 52393 – Investment Advice). But, the exposure chain extends beyond these one-degree relationships. Some industries either derive their exposure from other industries, or through a combination of direct and indirect exposure.

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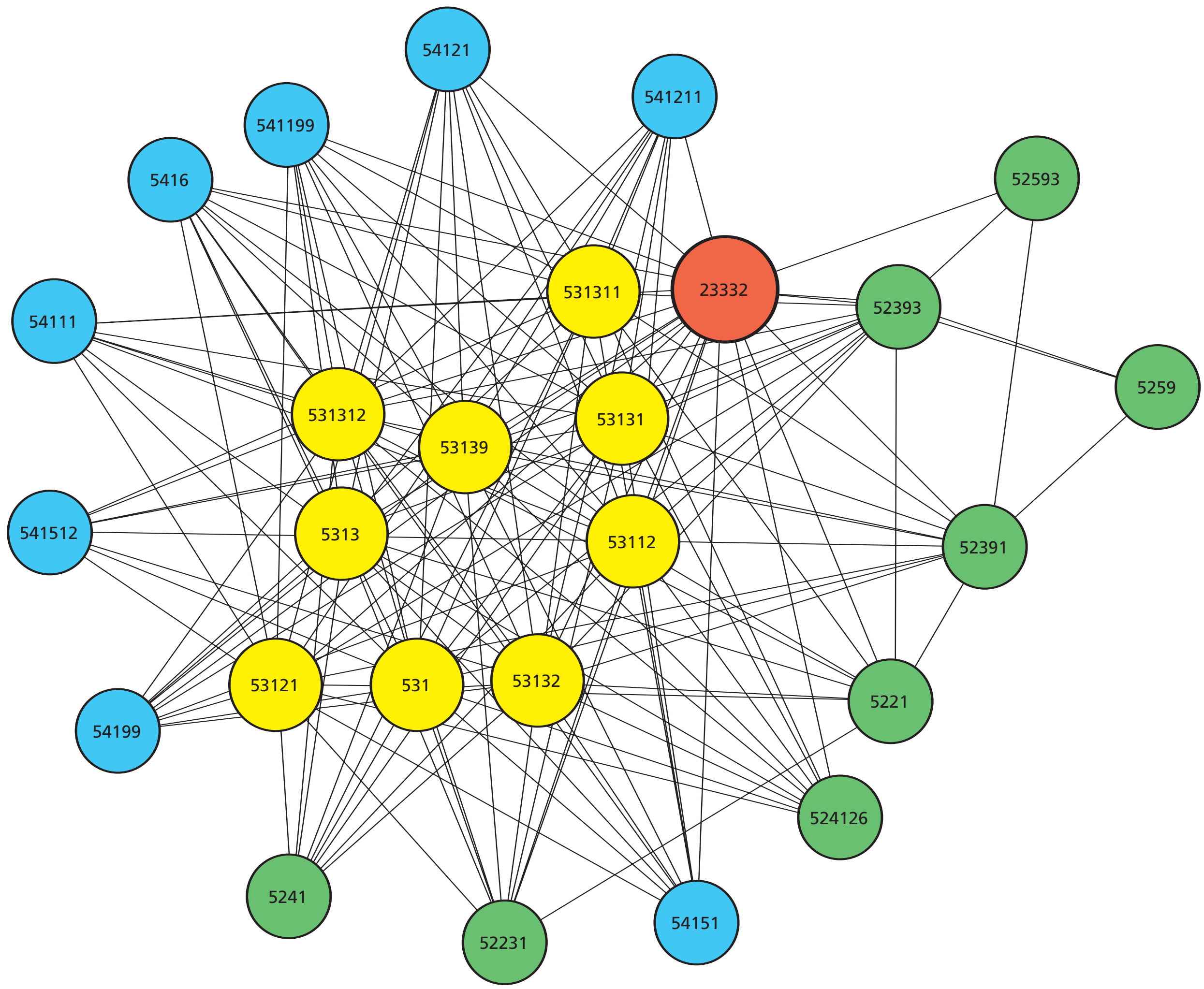
Casualty Cat Network Diagram: Exposure Extent



Source: Guy Carpenter & Company, LLC

As a result of the interconnected nature of business relationships across industries, many companies that ostensibly have little to do with commercial property development could be sued, putting their insurers at risk. The direct relationship of "one cause, one effect" clearly cannot be the benchmark for risk management. This hypothetical case shows that the actions of one company could subject countless others to litigation. For (re)insurers, the consequences can be costly.

A Platform for Action

While Casualty Cat makes the domino effect from the original trigger seem intuitive, the threats derived from the cause are not readily discernable on their own. A carrier would have to devise a scenario, trace the implications through a vast network, and hope that nothing is missed. A scenario could be overlooked, or an implication may not be captured. As this relatively straightforward example shows, complexity arises quickly. Think about the level of effort needed to antici-

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pate the effects of the subprime mortgage crisis or the initial public offering (IPO) laddering situation back in 2000. Without the capabilities of a robust model, there is plenty of room for error.

Since no event occurs in a vacuum, a single incident can gain momentum rapidly and take months – even years – to run its course. Even the seemingly unrelated could be contaminated. Casualty Cat discovers the hidden links that could lead to unexpected claims well into the future, allowing carriers to take preventive measures now.

Using Casualty Cat to determine the full extent of the risks to a casualty carrier's portfolio, it is possible to construct and implement a thorough risk management plan. If a casualty catastrophe does strike, the protection afforded by the Casualty Cat-supported plan should prevent balance sheet damage and, in the extreme, threats to solvency. Of course, the carrier will be able to improve capital management as a result of more informed decision-making.

Prevent Risk, Protect Profits

The nature of risk is changing. In the past, carriers could pool insureds and let the "law of large numbers" act as a buffer. Today, these pools are not self-contained. Every company – and every policy – is part of a neural network that spreads risk rapidly to corners of the marketplace where one would not expect to find it.

Casualty Cat tracks risk. Following the network that emerges from the relationships required to conduct business in today's interconnected economy, it identifies the threats that carriers need to address through underwriting practices, product pricing, and risk transfer. Knowledge is the most effective starting point for action. A risk that can be seen can be hedged.

There may be countless risks buried in (re)insurer portfolios around the world that simply go unnoticed. They are not unmanageable, just unknown. Casualty Cat gives them no place to hide.

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About Guy Carpenter

Guy Carpenter & Company, LLC is the world's leading risk and reinsurance specialist and a part of the Marsh & McLennan Companies. With 50 offices worldwide, Guy Carpenter creates and executes reinsurance solutions and makes available capital market solutions* for clients across the globe. The firm's full breadth of services includes line of business expertise in Agriculture; Aviation; Casualty Clash; Construction All Risk and Engineering All Risk; Excess and Umbrella; Life, Accident and Health; Marine; Medical; Political Risk and Trade Credit; Professional Liability; Property; Retrocessional; Surety; Terrorism and Workers Compensation. GCFac®, our dedicated global facultative reinsurance unit, provides the placement strategies, information and timely market access that are critical to obtaining strategic facultative reinsurance. In addition, Guy Carpenter's Instrat® unit utilizes industry-leading quantitative skills and modeling tools that optimize the reinsurance decision-making process and help make the firm's clients more successful. Guy Carpenter's website address is www.guycarp.com.

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