



# C-Level Agenda

Exposure data quality is a key indicator of operating risk.

by Ajay Lavakare

**I**mproving data quality has become a major concern for many insurance and reinsurance companies. In part, their concerns are driven by rating agency requirements and new regulations that put the onus on enterprise risk management. And it is no longer the sole domain of catastrophe risk managers.

Senior management has recognized the considerable competitive advantage to be gained from better exposure data and hence better catastrophe model results. The challenge is to keep this momentum going through a softening market.

In recent years, underwriters and portfolio managers have increased their use of and reliance

on catastrophe models. At the same time, the models have become more sophisticated and sensitive to data quality.

The turning point came after the hurricane seasons of 2004 and 2005 when six hurricanes hit the Gulf states, causing damage in excess of \$70 billion. Concern about the quality of exposure data was triggered by the differences between modeled losses and actual claims experiences from those highly active hurricane seasons. An analysis of 2004 claims data undertaken by Risk Management Solutions highlighted the significant role of poor exposure data quality used in the models (see "Recipe for Disaster," page 84). RMS found these data contributed from 20% to 45% of the gap between modeled and actual losses.

Exposure data quality affects catastrophe model loss results in two ways. First, it affects the mean

► **The Situation:** Insurers and reinsurers need high-quality exposure data in order to demonstrate robust risk management practices.

► **The Issue:** Poor quality exposure data results in unreliable risk model outputs and costly overexposure.

► **The Solution:** C-level executives must direct a full assessment of exposure data quality within their organizations and update where necessary.

loss itself. For example, earthquake-modeled losses for a steel frame structure on liquefiable soil in California are significantly lower than for a light metal structure at the same location, assuming all other physical characteristics are the same. Knowing whether a building is steel frame or light metal has an impact on the mean loss results.

Second, data quality affects the uncertainty of loss results. Knowing a structure's exact location down to the street level, as well as various physical



**CODE RED:** Insured losses after Hurricane Katrina were exacerbated by inaccurately coded risk factors, an Ernst & Young study found. The storm ruined billions of dollars' worth of resort property in Biloxi, Miss., including this \$100-million, pirate-themed casino. But many properties had been incorrectly labeled "steel frame" when they were actually far less durable, the study said.

characteristics (construction, occupancy, year built, height, square footage, etc.) will yield a loss distribution with a significantly lower "spread"—meaning a lower standard deviation—compared to loss results for the same building if geocoded at the ZIP code level, and all physical characteristics were coded as unknown. In fact, exposure data quality is the one controllable element of uncertainty in catastrophe risk models.

### Finding Hard Evidence

Many of the exposure data quality assessment projects recently undertaken by insurers and reinsurers have had boardroom-level sponsorship. "Focusing on data quality not only enables us to price risk and manage our portfolio more effectively," said Juergen Guhe, chief risk officer for Fireman's Fund, on the completion of a data quality assessment project earlier this year. "It is also a key differentiator with

reinsurers and can enhance rating agency assessments by reducing uncertainty in catastrophe modeled results."

Previously the responsibility of catastrophe risk managers, data quality is now gaining visibility in the boardroom for a number of reasons. Chief among them is new rating agency and regulatory requirements. Insurance and reinsurance companies must adopt an enterprise risk management approach to their businesses in order to remain competitive.

A core part of this new holistic approach is having a sophisticated understanding of catastrophe risk exposures. This helps inform underwriting decisions, portfolio management, risk transfer decisions and capital and capacity allocation.

Increasingly, rating agencies are looking for more hard evidence of quality data. To date, rating agencies have not been able to quantify

## Proving Grounds

RMS applies these criteria to assess if exposure data are top-quality or lacking:

- **Consistency:** The extent to which data are presented in a consistent format and in the appropriate units for input into catastrophe risk models.
- **Completeness:** The resolution (or granularity) of the data as well as the number of, and importance of, unknown data.
- **Accuracy:** How correct the data are, based upon:

**Credibility:** Whether the data are believable and logical.

**Objectivity:** Whether the data are coded in a manner that is unbiased, unprejudiced and impartial.

**Comparisons with reputed sources:** How well the data compare with data ascertained from reputed independent or third-party sources.

Source: Risk Management Solutions

the quality of data that companies use, nor are they yet looking at specific data-quality metrics; hence their opinions have been largely qualitative.

Nevertheless, the rating agencies clearly believe that better data quality is a sign of a more successful company. A.M. Best Co. specifically identified data quality as a key factor for strong catastrophe risk management in May 2006 (see "Handle With Care," page 84). Best incorporated several data quality related questions in the Catastrophe Exposure Management section of the 2006 supplemental rating questionnaire of P/C companies, including questions on geocoding percentages at street level and vintage of data used.

The rating agencies take the view that if a company is not very good at understanding and controlling the parameters that impact the balance sheet, such as data quality and catastrophe modeling, a shadow is cast on their ability to manage other aspects of their business, such as internal controls and enterprise operating risk.

Rating agencies also want to

Property/Casualty

ensure that various levels of data quality can be differentiated appropriately. This helps companies better understand an important part of the credit rating process, while allowing agencies to give proper credit to those that have invested in improving their data quality.

**Better Data = Better Prices**

From an underwriting perspective, better data also can lead to more accurate pricing. Companies can enforce underwriting discipline by using data quality as a differentiator in determining access to capital by different underwriting business units. Rather than allocating capacity solely based upon the modeled risk, underwriting business units with good-quality data could have a first call on capital (all other things being equal).

Data quality also helps in the reinsurance placement and pricing process. An Ernst & Young survey of 12 global reinsurers, presented at the Reinsurance Association of America Cat Modeling Conference in February 2008, indicated the quality of cedents' data was reinsurers' single biggest concern with their companies' ability to underwrite property cat risk.

Respondents said risks are more attractive if a data quality report indicates good controls around collection, maintenance and enhancement of data. They said they would provide premium credits of 5% to 10% if they received a good report from an independent source. The survey takers also said they would be willing to extend additional capacity if such an independent

**Recipe for Disaster**

Examples of how the lack of detailed underwriting worsened the insured losses from the notorious 2004-05 hurricane seasons:

- **Low geocoding resolution:** Beachfront properties were identified only by ZIP code.
- **Missing or incomplete physical descriptions:** Buildings' year of construction, height and other vital data never entered into files.
- **Inaccurate risk coding:** Floating casinos were coded as reinforced concrete buildings; light metal construction was coded as steel frame.
- **Miscoded financial policies:** Coverage limits being used in place of actual values.
- **Undervaluation**

Source: Risk Management Solutions

report was provided. Data quality should therefore inform pricing and renewal discussions, which become even more critical in a soft market.

From an enterprise risk management perspective, insurers and reinsurers that understand their exposures and actually know what they are covering should not be caught short when a catastrophe occurs. On the other hand, a company with a poor understanding of its data may need to make frequent changes to published loss estimates in the days following an event.

This can suggest a lack of internal controls that will confuse investors. It also may lead to breaching reinsurance limits and, in extremis, company failure. Some companies think they have access to good data when in fact they don't. Many seem to have a false sense of security about their data quality, relying on incomplete metrics such as street geocoding.

**Doing Their Best**

So what are the main challenges the industry faces in its effort to implement data quality-related best practices? It is essential that companies measure and benchmark

their current data quality in order to improve.

Demonstrating the cost/benefits of quality data is important to motivate insurers and reinsurers to continue their improvement efforts. The lack of an accepted standard for exposure data quality, however, is a key issue here. ACORD, a non-profit insurance industry association, has set up a CAT Exposure Working Group to develop a scalable, international exposure data standard and to make the capture, storage and movement of catastrophe data seamless.

Once participants in the insurance industry data chain adopt a standard, the next challenge is to develop a systematic, marketwide, quantitative approach to assessing and enhancing data quality. To institutionalize such an approach, more rigorous metrics that speak to the links between data quality and catastrophe model results, and the impact of uncertainties, inaccuracies, and biases on risk are needed.

By measuring its quality, data can then be managed. Several frameworks to assess and represent data quality exist (see "Proving Grounds," page 83)

Today, the data quality issue is at an important crossroads. On the one hand, many reinsurance markets continue to differentiate between cedents on the basis of their exposure data quality. Enterprise risk management and regulatory requirements are driving this forward, as is the increased use of catastrophe models in informing underwriting decisions.

On the other hand, it's been three years since the hurricanes of 2005 and memories are short. The market is softening and underwriting discipline may be eroding, creating conditions for deteriorating data quality. There is a strong feeling among insurance industry leaders that the topic of data quality must once again be brought to the forefront.

Otherwise the next catastrophe may reveal the unintended consequences left in the wake of a soft market cycle.

BR

**Handle With Care**

Strong cat-risk management results from these five factors:

1. Senior management's firm commitment
2. Proper coding of loss exposure
3. Geocoding of all properties
4. Auditing of exposure coding
5. Using most current insurance-to-value analyses

Source: A.M. Best