The RMS® Builders Risk Model is a fully probabilistic catastrophe model for earthquake, hurricane, and hurricane storm surge risks in the United States, and for earthquake risk in China. The unique vulnerability and value ramp-up characteristics of construction projects are reflected in the model, allowing insurance underwriters to quantify risk for this class of property insurance more realistically than through traditional catastrophe modeling approaches.

Builders Risk

Probabilistic Loss Modeling of Construction Projects

The risk posed to the builders risk class of property insurance is dynamic in nature. Due to the structural changes and fluctuations in exposed values that occur during the phases of a construction project, standard approaches to exposure and vulnerability modeling cannot adequately quantify risk. The ramp up in exposed values occurs at different rates depending on the project type and phase, so the vulnerability and value ramp up must be considered together to gain a true picture of the risk of loss at a construction site.

In the RMS® Builders Risk Model, projects are broken into critical construction milestones that relate directly to vulnerability and value ramp up, allowing companies to analyze risk by construction phase for the full suite of probabilistic catastrophe events available in the RMS® U.S. Earthquake, U.S. Hurricane, and China Earthquake models.

Multiple Perspectives on Financial Risk

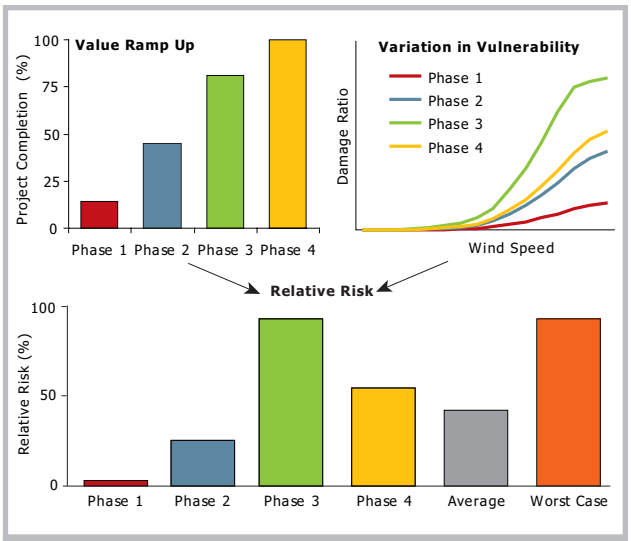
Using the Builders Risk Model, underwriters can analyze critical phases of construction for a particular project, such as construction phases that align with the hurricane season in hurricane-affected states. Underwriters can also update analyses based on the most recent phase of construction, as documented through an on-site risk engineering survey. Additional flexibility is built into the model to understand risk at the account or portfolio level, including:

- Quantification of loss based on average or worst-case vulnerability over the course of an entire project
- The ability to combine builders risk results with finished property analysis results calculated using other RMS peril models
- Data management tools allowing users to update all projects within a portfolio to the phase of construction at a given analysis date

Examples of residential and commercial construction projects during different construction phases

Integrated Data on Value Ramp Up

Because information on project values during the course of construction often is not readily available, RMS designed the Builders Risk Model to use completed project value to represent insured exposure. The model then scales the property loss estimate to reflect the estimated value on site for the selected occupancy and phase combination. RMS researched cost ramp up for the various occupancy types to calculate the average percentages of completed values on site for modeled occupancy/phase combinations. Insured value ramp-up curves link the time spent to reach critical milestones (phases) with the percentage of total project value at completion.



Incorporation of value ramp up and vulnerability to overall hurricane risk

Vulnerability Based on Multiple Factors

Extensive RMS research on the vulnerability of completed structures and underlying structural components to modeled perils is incorporated into a comprehensive suite of vulnerability functions for earthquake, hurricane, and storm surge risk. The model considers the amount of loss due to structural damage, contents damage, and business interruption at each phase of construction, and considers a wide range of occupancy/phase combinations and construction classes when estimating potential loss. Vulnerability is differentiated by peril, project type (occupancy), phase, and construction class, as well as by height for all perils, and by region for earthquake, reflecting differences in building code requirements and construction practices in the U.S. and China.

Model Specs

History

Original release in 2003; most recent upgrade in 2007

Geographic Scope

United States, China

Modeled Perils

Licensed in conjunction with the RMS® U.S. Earthquake, U.S. Hurricane, and China Earthquake models

Occupancy Types

- Residential, commercial, institutional, stadium/convention center, light industrial, heavy industrial, power plant, port, water treatment plant, bridge, dam, pipeline, tunnel, highway
- Average and worst-case loss estimates
- Loss based on 4 phases of construction for U.S., and 5 for China

Special Features

Data management tools allow users to update all projects within a portfolio to the phase of construction at a given analysis date

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