What Direct Impacts Do We Face?

Business, Insurance, & Financial Implications of the next Northridge EQ

Tom Larsen, Product Architect, EQECAT

The 1994 Northridge Earthquake: Impacts, Outcomes, and Next Steps

January 16-17, 2014
Los Angeles, CA
The Northridge EQ
A seminal moment for Cat Modeling

- The 1994 EQ was one of the earliest demonstrations of modeling

- EQE (a prior company to EQECAT) provided immediate post-event guidance to help Governor Wilson expedite the recovery

From: The January 17, 1994 Northridge, CA Earthquake. An EQE Summary Report
Earthquakes affect many aspects of buildings

- 2nd story collapse, Concrete Frame Building
- Collapsed interior, Northridge Fashion Center (retail)
- Cooling towers damaged (no occupancy)
- Collapsed Parking
Damaged Housing
Transportation
Not all damage is immediately visible

- The construction practice of leaving backing bars in welded connections led to brittle behavior
- Damage to steel buildings was only discovered after expensive inspection of ALL steel joints in a building
What to expect for the next one?

- A recurrence of the Northridge EQ today
  - ~10 seconds of ground shaking
  - Displaced lodging / Business Interruption
- Direct Insurance Recoveries
- Cash shortfall

$90 B (80-$140B)  
$85 B ($75 -$110)  
$6 B ($5 - $30)  
$15 B ($12 - $30B) 
$75 B

The ground-up damage estimate for Northridge today is about twice what was observed in 1994. Consumer inflation and population growth are the primary drivers, but a 4:30 AM occurrence time reduced the loss potential.
Is “Northridge” the right planning scenario?

2008 ShakeOut scenarios produce $100-$250B estimates

Estimated Ground-up Loss from Earthquake Shaking in LA Basin 2014

Probability of being exceeded in 50-year period

Expected loss in planning period

$0 $50 $100 $150 $200 $250 $300 $350 $400

Billions

0% 10% 20% 30% 40% 50% 60%

Recurrence of Northridge

~475 year return period loss

~72 year return period loss
What else to expect?

**Issue:**
- Extended power outages (Hurricanes Ike & Irene)
- **Direct hit/ Damaging Aftershock** (Christchurch NZ)
- Parallel disasters / CBI Tohoku
- **Residential Mortgage default** (seen in Hurricane Katrina)
- **Commercial Mortgage-back securities default** (Sandy)

**Potential Solution:**
- Keep improving mutual aid agreements
- Super-hardening of selected facilities?
- Mandatory EQ Insurance? Alternative to Insurance?

“Things always become obvious after the fact”
— Nassim Nicholas Taleb, author of the Black Swan
Northridge Earthquake, 20 years later

- Northridge EQ demonstrated the value of catastrophe models for immediate response

- Catastrophe models can help us identify and anticipate reasonable planning scenarios

- The next disaster will include everything that we have seen in past catastrophes, plus much more

Tom Larsen
tlarsen@eqecat.com
www.eqecat.com