

CALIFORNIA SHAKIN' with Dr. Lucy Jones

Please wait for the program to begin.



WHAT DOES EARTHQUAKE RESILIENCY LOOK LIKE FOR MY HOA? October 13, 2020

What is Motus? What problems does Motus solve?

The **Motus Opt-in Earthquake Insurance Program** is a new alternative for CID boards evaluating earthquake insurance

Motus Addresses Two Major Issues:

- 1) 32,000 common interest developments do not buy a master earthquake policy, leaving unit owners on their own
- 2) The individual insurance options only work if the association has a master earthquake policy

A) Coverage capped at \$100,000

- B) No coverage for common areas or foundations
- C) 70% of unit owners **are not even eligible** for earthquake insurance on their own
- D) If eligible for the limited coverage, pricing 3-10 times higher than pricing for single-family homes

This means roughly 2.3mm unit owners can't fully insure themselves

So how does Motus "opt-in" program work?



Step One – Board Approval

The board pays a \$850-\$2,000 enrollment fee which allows all its members the ability to buy a custom-built individual product from "A" rated, admitted carriers that specialize in earthquake insurance for CID's

Carriers like Palomar, Insurance Company of the West or Aegis

Step Two – Unit Owner Enrollment

- Once the CID enrolls, each unit can purchase their custom-built policy on their own. Billing is done directly between the unit owner and the carrier.
- Every unit owner is eligible
- Unit owners can buy as much coverage as they would like (we have one high-rise HOA client where unit owners can buy up to \$5,000,000 of coverage)
- Coverage includes damages to common areas, foundations, all residential buildings and unit interiors
- Pricing is in line with single-family home rates. 3-5 times cheaper than other individual CID unit owner options

Earthquake Resiliency: Two parts



 Preparation: What Can Boards Do To Prepare?

 Response: What Can Boards Do In The Aftermath? PREPARATION What Should Boards Do To Prepare?

- Investigate your exposures to earthquakes
- Review ways to fund damages before the earthquake
 - Build up reserves
 - Master Policy (cost, approval requirements, etc.)
 - Motus Opt-in Program
- Review ways to mitigate or reduce potential damages — Retrofit
- Advise your members / document everything

RESPONSE What Can Boards Do In The Aftermath?

- Reach out to legal counsel to find out what boards can or can't do without a membership vote
- Make timely legal claims if possible
- If you have a master earthquake insurance policy, file a claim
- If your association is one of 32,000 associations without a master earthquake insurance policy, your association will be reliant on two mechanisms for funding repairs:
 - SBA (federal) or private loans can provide funds for repairs (but must be repaid)
 - Levy a large special assessment to cover damages to common areas, structures and unit interiors
- HOA may chose to dissolve and sell the project



California Shakin'

Living with earthquakes in the Golden State

Dr. Lucy Jones

Founder and Chief Scientist, Dr. Lucy Jones Center for Science & Society Research Associate, California Institute of Technology



Northridge Meadows Apartment complex



Today's outcomes

You will understand why the West Coast has earthquakes You will know how earthquakes cause damage

2

You will know which types of buildings have the most problems in earthquakes

3

You will be able to help your community become better prepared for the inevitable earthquakes in our future.

4

What is an earthquake?



Kobe, Japan M7.2, 1995



Fault offsets

New Zealand 2017



Imperial Valley 1940

Fault offset cannot be stopped

 California State law

• Passed in 1978

 Prohibits building across an active fault

 Does not remove buildings already there



Sylmar 1971

Intensi ty Shaking

Description/Damage

Ι	Not felt	Not felt except by a very few under especially favorable conditions.
П	Weak	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may ro slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Moderat e	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; some fallen plaster. Damage slight.
VII	Very strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinal substantial buildings with partial collapse. Damage great in poorly built structure Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with part collapse. Buildings shifted off foundations
Х	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

Modified Mercalli Intensity scale





PERCEIVED SHOKING	libt et	Weak	_igH	Moce are	strong	Verystrong	Severs	Voent	:::::me
POTENTIAL UNIDAGE	nore	none	none	Very ligh:	Lgni	Moderate	viodarale Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	s.17	.17-1.4	1.4-2.9	2.8-9.2	9.2-18	10-0+	04-85	65-12-	>124
TEAK VIL (cma)	<.1	C.1 1.1	1.1 3.1	3.18.1	8.1 16	18 31	31 60	80 118	+115
INSTRICT FUTAL	1	11-111	N	N.	VI	VII	VIII	18	14

Comparison of Recent and Historic Earthquakes by Energy Release



What is different about a big earthquake?

Bigger earthquakes on longer faults





Most damage at Intensity IX





Big Bend of the San Andreas Fault



Cucamonga Fault



Seismic Hazard Maps

- Time-independent rates expressed as a 30 or 50 year probability
- Take all the known faults, predict magnitude by length
 Estimate shaking from magnitude

Courtesy of California Geological Survey & U. S. Geological Survey



The Resilience Equation

Risk = Hazard × Exposure × Fragility ÷ Response ÷ Recovery

Hazard = what the earth does to us: faulting, volcanoes...



Exposure: Extent & density of built environment Fragility: Structural weaknesses





Will to recover

Response



Evolutionary constraints on human intelligence

• Our intelligence evolved to make us safer in a primitive world

Creating patterns to theorize about the risks





Finding patterns

Dis-aster = Ill-starred



700,000+ earthquakes were recorded California in the last 40 years



in Southern

What we don't know is when



Years between big quakes on central San Andreas fault at Frazier Park

Scharer et al, 2017

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Too late to change!

March 11, 2011 Tohoku M9.0

Lesson 1: Mitigation works



Shaking: New buildings

- In worst earthquake, 90% probability of not collapsing
- 10% probability of collapse = 10% of new buildings collapsing



Christchurch 2010





Christchurch, Feb 22, 2011

Christchurch 2015



More problems in older buildings



Unreinforced masonry

Soft first story

Non-ductile concrete

Pre-1994 steel moment frame

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Response



Earthquake triggering



Aftershocks/Foreshocks > 50% of all events in California

Aftershock behavior

• The number dies off as one over time.

- Small quakes are much more common than large ones. For each unit of magnitude, we have 10x as many events.
- Productivity of an aftershock sequence is very variable. The mean value of the largest aftershock is 1.2 units below the mainshock.
- 5% of the time, the largest aftershock is bigger and then we change the name of the first quake to "foreshock."



Spatial distribution of aftershocks

Aftershocks = within 1 fault length

Triggered earthquakes = within 3-4 fault lengths



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Response



SOCIAL REPERCUSSIONS



How do we speed up recovery?

 Mitigation prevents damage, reducing need for response

 Planning improves response and recovery

 Quick influx of money



TIME

Disaster Resilience:

A society that functions after the disaster



LIABILITY

Every owner is equally liable for cost of repairs—even if their unit is not affected.



BEFORE AN EARTHQUAKE **Boards can (and should)** take steps to reduce potential damage (both physical and financial) Managers can and should advise boards to transfer risk to third parties



INVESTIGATE

Use experts verify your building complies with the earthquake safety measures (Business Judgment Rule)

- Gas shutoff valves
- Water heater straps
- Post reinforcements
- Balcony inspections



GOVERNING DOCUMENTS

Legal Review

- Duty to insure
- Rebuilding provision
- Reserve funding
- Power to borrow
- Power to dissolve HOA

INSURANCE

- Walls-in coverage?
 - CGL for fire
- Earthquake insurance?
 - For water damage
- Owner insurance?
 - HO-6 for condos



NO INSURANCE

If the association does not have earthquake insurance:

- Large special assessments
- Borrowing (debt service)
- Possible dissolution-do they?



BORROWING MONEY LENDERS or FEMA?

- Board power to borrow money? (membership vote required?)
- 25 units or more (reduces risk)
- <10% delinquency >60 days past due
- Owner/tenant occupancy less than 50%
- First FEMA applications more likely to succeed

BOARD CHECKLIST

- Community manager
- Insurance agent
- Legal counsel
- Banker
- Disaster relief agencies
- Reserve fund liquidity



ADRIAN J. ADAMS, ESQ CAT CARMICHAEL, PCAM

CEA CALIFORNIA EARTHQUAKE AUTHORITY^M

October 13, 2020 Chief Executive Officer Glenn Pomeroy



Residential Earthquake Insurance

- 1.1 Million Policyholders
- Publicly Managed/Privately Financed
- Not for Profit



Residential Earthquake Mitigation Grants

- Pre-1980 Homes/\$3,000 Grant
- Retrofits to date: 12,000
- 2020 Goal: 4,400 Retrofits



California Wildfire Fund

- Coverage for Wildfires Caused by Investor Owned Utilities
- \$21 Billion Fund



Policyholder Growth



New Participating Insurers

CEA Claim Paying Capacity

CEA Return Period	Probability	2020 Estimated CEA Loss	Reoccurrence of Previous Earthquakes	2020 Claim Paying Capacity 1 in 400 Return Period
1 in 400	.25%	\$19 B		\$19 B
1 in 350	.28%	\$17.7 B		IAL \$1.7 B
1 in 300	.33%	\$16.3 B		CEA Surcharge \$1 B
1 in 250	40%	¢140P		Bond Proceeds \$1.1 B
111250	.40%	Ъ14.9 D	1906	
1 in 200	.50%	\$13 B	San Francisco \$13 B	•
1 in 150	.66%	\$11 B		Reinsurance \$9.2 B
1 in 100	1%	\$86B	1994 Northridge	
1 11 100	T 10	ψ0.0 Β	\$8 B	•
			1868 Hayward \$6 B	
1 in 50	2%	\$5.2 B		
				Capital \$6 B
1 in 10	10%	\$630 M	>\$1.3 B 1989 Loma Prieta 2014 Napa 2019 Ridgecrest	

Rating Agencies require CEA to meet an extremely conservative benchmark: enough claim paying capability for a 1 in 400 year return period.

For 2020, CEA must have access to \$19 billion to pay for potential claims.

To meet this benchmark this year, CEA will spend nearly \$400 million for \$9.2 billion of reinsurance protection.

Since opening in 1996, CEA has spent \$5 billion on reinsurance. Because California has not been hit by a catastrophic earthquake during that time, reinsurers have paid a total of \$250,000 in reinsurance claims over that same period.

EarthquakeAuthority.com

Premium Calculator



EarthquakeAuthority.com

Premium Calculator



CEA Homeowners Policy Overview



CEA Homeowners Policy Overview

Reconstruction Cost	Same reconstruction cost as homeowners policy Deductible options: 5% - 25%
Personal Property	Up to \$200,000 Deductible options: 5% - 25%
Loss of Use	Up to \$100,000 No deductible
Mitigation Discount	Properly retrofitted homes built before 1980 may be eligible for discount an up to 25% discount

CEA Condo Policy Overview



CEA Condo Policy Overview

Condo Interior Coverage	Up to \$100,000 5% to 25% of the condo interior coverage amount
Personal Property	Up to \$200,000 5% to 25% of personal property coverage amount
Loss of Use	Up to \$100,000 No deductible

CEA Renters Policy Overview



|--|

Personal Property	Up to \$200,000 Deductible options: 5% - 25%		
Loss of Use	Up to \$100,000 No deductible		

MITIGATION

Retrofitting older homes

Earthquake Vulnerabilities



Cripple Wall

Living-space-over garage





Hillside House

Chimney

Cripple Wall



House shifted and dropped



Cripple wall collapsed

2014 South Napa M6.0 Earthquake damage

EBB Retrofit: Cripple Wall



Cripple Wall Retrofit: Framing Clips, Foundation Plates, and Plywood





Foundation plate Crawlspace After Retrofit

Crawlspace Before Retrofit

EarthquakeBraceBolt.com



12,000 Retrofits Over Last 5 Years

Grant recipients are not required to be a CEA policyholder

CEA policyholders may be eligible for up to a 25% premium discount.

JONUS in the World's Largest Earthquake Drill. Shake October 15, 2020

www.ShakeOut.org