



# **Shake, Rattle and Roll**

## **Solid Gold Quake Hits of the 30s, 40s, 50s, 60s & 70s**

**Annual Meeting  
San Francisco, California  
February 5, 2010**

# PROGRAM

*Yesterday we travelled to the future and back; tonight we revisit the past*

## **Your Host for Tonight's Time Travel:**

Doc Brown and his flux capacitor

*Through the miracle of infinite velocity, Doc will take us down memory lane to enjoy again the great quake engineering hits of the last several decades.*

*"Something's Gotta Give" Hysteretic Loops & Orthogonal Modes*

*"The Bridges of Alameda County" Loring, Loops & Modes*

*"Surf and Be Sorry" Eric and the Resonators*

*"Earthquake Prediction" Jack and Janiele, with the Resonators*

*"Shake That Thing" Hysteretic Loops, Orthogonal Modes, and Single Degree of Freedom Singers*

*"Senior Partner" Single Degree of Freedom Singers*

*"High Probability" Eric and Janiele with the Loops and Modes*

*"Performance-Based Design" Loops, Modes and Resonators*

*"Zone Sweet Home" Loops, Modes, and Freedom Singers*

**Special Guest:** Dr Sluice with "Horton Hears an Engineer"

# Soil-Structure Interaction

*Tune: Something's Gotta Give*

When an irresistible force such as you  
Meets an old immovable object like me,  
You can bet as sure as you live:  
Something's gotta give, something's gotta give  
Something's gotta give.

When an input motion like yours  
Hits the foot of a structure like mine,  
Response analysis shows:  
Right then, right there,  
Kinematic interaction grows.

So watch out! Who knows what the wave periods will be  
As they arrive at the base?  
When soil sediments amplify them,  
Ductility demands increase!

Damp, damp, damp, damp, damp it, though we may strive,  
In the next Magnitude 7.5,  
We'll find out as sure as we live:  
Something's gotta give, something's gotta give,  
Something's gotta give.

Damp, damp, damp, damp, damp it, though we may strive,  
In the next Magnitude 7.5  
LFE studies will disclose:  
Deformations at the base of shear walls significantly affect  
the force distribution in the upper stories of buildings.

Or something's gotta give, something's gotta give  
Something's gotta give!

# **The Bridges of Alameda County**

*Tune: It's Been a Long, Long Time*

Fix it once and fix it twice and fix it once again  
It's been a long, long, time.  
It failed twenty years ago; why do we use it when  
It's been a long, long time?

We'll never know how many schemes CalTrans said no to  
Or just how many millions they have run through.  
The politicians dithered once and dithered twice again  
Which took a long, long time!

Will they get the new bridge open before the old one tires?  
It's been a long, long time.  
Can duct tape and metal plates and large-gauge bailing wire  
Hold on a prolonged time?

We still don't know how many eye bolts are fatiguing  
Or whether there are contractors intriguing.  
So finish up the new bridge now, and give us all a chance;  
It's been a long, long time.

A long, long, time.

# Surf and Be Sorry

*Tune: Surfin' Safari*

Let's go surfin dude, don't be such a massive prude,  
Ride a tsunami with me!

When a Warning Center bulletin arrives in our mail  
We grab our boards and head for the shore  
Gotta be out there when the wave comes in  
So we can drop right into the bore.

Come on buddy, wait and see, we're going to catch a tsunami.  
Come on along, you're young and strong,  
So make a big wave with me

Let's go surfin dude, etc

In Samoa and Tonga they're repairing the piers  
In the Solomons they're fixing their boats  
In places all around the world the people have fears  
But you and I are ready to go!

Come on buddy, etc  
Let's go surfin dude, etc

They're worrying in Ventura and Crescent City  
They're posting signs in Humboldt Bay too  
But we're out looking for the perfect wave  
From Mendocino to Point Mugu!

Come on buddy, etc

Let's go surfin dude, don't be such a massive prude!  
Ride a tsunami with me! Yeah me, hodad, with me.

# Earthquake Prediction

*Tune: How High the Moon*

An earthquake's coming—how big, how soon?  
We can't say just when; tomorrow noon??  
If your pet hamster begins to act queerly,  
I would suggest you do not behave cavalierly.

An earthquake's coming—how near, how far?  
We can't say just where; Viña del Mar??  
There is no way to know with perfect acuity,  
So brush up your tolerance for ambiguity.

An earthquake's coming—how big, how near?  
It could be quite large; this hemisphere??  
We know for certain that a tremor's way overdue,  
And when it strikes, no one can say we didn't warn you.

# Shake That Thing

We do our research using tables that twitch  
Build models on 'em and then throw the switch.  
Oh, Shake that Thing, Go on and Shake that Thing  
It's so exciting when you shake that thing!

Out in Richmond they worry about bridges  
Design and test 'em to work out the glitches.  
Oh, Shake that Thing, Why not Shake that Thing  
It's so delighting when you shake that thing!

Off at Cornell they displace pipelines  
To improve their seismic design.  
Oh, Shear that Thing, Yes, Shear that Thing.  
It's so indicting when you shear that thing!

At Reno's table they have digital control  
The thing can dance, pitch, yaw, and roll.  
Oh Shake that Thing, Yeah, Shake that Thing  
It's so nail biting when you shake that thing!

Up in Buffalo they're improving their abilities  
To reduce nonstructural fragilities.  
Oh, Shake that Thing, Yeah Shake that Thing  
It's so enlighting when you shake that thing!

At UCLA their lab's on wheels  
They drive around in their shaking mobile.  
Oh, Shake that Thing, Why not Shake that Thing  
It's so igniting when you shake that thing!

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In San Diego the gyration and vibration  
Comes from potent hydraulic actuation.  
Shake that Thing, Whoa, Shake that Thing  
It's so uptighting when you shake that thing!

Over at Stanford seismic risk is king  
They know fragilities for everything.  
Oh, Shake that Thing, Why not Shake that Thing  
It's so inciting when you shake that thing!

In Corvallis there's a great big basin  
They can make tsunami waves in.  
Hey, Slosh that Thing, Yes, Slosh that Thing  
It's so inundating when you slosh that thing!

Our students gather once a year  
To demolish models without a tear.  
Oh, Shake that Thing, Break that Thing  
It's so educating when you break that thing!

If earthquake research is so hard and serious  
Why does it make us all delirious?  
Oh, Shake that Thing, Please, Shake that Thing  
It's so exciting when you shake that thing!

It's so damn exciting when you shake that thing!

## Senior Partner

*Tune: When I'm 64*

When you get older, losing your edge, a few years from now,  
There will not be many jobs for you to do:  
A bathroom renovation or two.

If you go home at quarter to three because you must nap,  
How can I enjoy you, how can I employ you, when you're 65?

I'll be older too,  
so I'll be capable of seeing right through you.

You could be handy, fixing a fuse when the lights are out.  
You can tell some stories at the staff meetings;  
Funny fellow beyond all doubt

Reading the sports page, doing the crossword,  
Bragging about your grandchildren.  
How can I enjoy you, how can I employ you, when you're 65?

Every winter you will want to travel  
To the warm southwest, where the golf is good;  
You'll be gone for weeks.  
At the flea markets you'll buy many great antiques.

Let's go to lunch and talk about this  
We could meet at Sam's.  
I will be quite pleasant, but I mean to say,  
WHEN do you plan to go away?

Give me your answer, think about it, take plenty of time.  
But I can't enjoy you, and I can't employ you  
When you're 65.

## High Probability

*Tune: It's Impossible*

It is probable that the Hayward fault will shift soon,  
It's very probable.

It is probable that the Peninsula will too, it's highly probable.

Do we live here in the fault zone and not know  
That in our deep bones?

Spend an hour every day wondering just when?

It's probable, you bet it's probable.

Will the Garlock slip before long?

It is probable.

Or some unknown blind thrust rupture? It's very probable.

There'll be pipe breaks and some fires  
but no water and no power.

Sepulveda will be jammed like at rush hour,

And the gridlock on the freeways will be intolerable.

On the San Andreas strain is growing.

It is probable.

Onshore and offshore, elasticity's increasing. It is probable.

But if you ask us why we live here, we just don't get it.

We have bought expensive houses and don't regret it,

For to live anywhere else would be impossible.

# Performance-Based Design

*Tune: Don't Worry Baby*

Well, they've been worrying about this  
For oh I don't know how long  
I don't see why but they keep thinking  
Something's bound to go wrong

So I look in their eyes  
And make them realize  
When I say, "Don't worry maybe"  
Everything will turn out alright.

Don't worry maybe, don't worry maybe, don't worry maybe.

I guess I should have been more vague  
When I started to discuss my plans,  
But I promised them that  
The building would meet their demands.

At this I was employed  
Cause they were overjoyed  
Again I swore, "Don't worry maybe"  
Everything will turn out alright.

I told them with such fine components  
You can be quite sure it won't collapse.  
And your investment will be safe  
After the next big earthquake...perhaps.

Oh, what it did to them  
It was a real gem  
When I affirmed, "Don't worry maybe"  
Everything will turn out alright.

## Zone Sweet Home

*Tune: Yellow Submarine*

In the town where I was born  
There were never any quakes,  
But I moved to Californ  
Where the ground often shakes.

Here I've bolted and I've braced  
And stored water by the case  
So that when the earthquake strikes  
I will not be displaced.

We all live in a seismic hazard zone  
Seismic hazard zone, seismic hazard zone  
*repeat*

If the shaking doesn't get us,  
Then the liquefaction will  
Or the land may slide away

We all live in a seismic hazard zone  
Or landslide hazard zone, or liquefaction zone  
*repeat*

Those who want a life of ease  
Buy a house right by the sea  
Where they put themselves at risk  
To a massive tsunami.

We all live in a seismic hazard zone  
Seismic hazard zone, seismic hazard zone  
Some of us work in Alquist Priolo zones  
Alquist Priolo zones, Alquist Priolo zones.

## Dedication

This evening's performance is for Susan Tubbesing, who has produced these follies every three or four years since Bruce Bolt first conceived of them in 1998.

She manages the stage, the house, and the box office with good humor and aplomb. She's not much of a singer or dancer herself, heaven knows, but she can recognize those talents in others with a perspicacity rivaled only by that of Flo Ziegfeld in his glory days.

Her performers, whom she always treats with kid gloves, all wish this were not her swan song. Thanks for the use of the hall!

# Master of Ceremonies

William T. Holmes

## Singers

Peggy Hellweg

Janiele Maffei

Sarah Nathe

Jeanne Perkins

## The Hysteretic Loops

Eric Borchers

Craig Comartin

Loring Wyllie

## The Orthogonal Modes

Nick Alexander

Heidi Faison

Ayse Hortacsu

Marko Schotanus

Veronica Cedillos

Christine Goulet

Anna Lang

## Single Degree of Freedom Singers

## The Resonators

Mike Bocchicchio, keyboard

Pat McClellan, string bass

Jack Moehle, acoustic guitar

## Poet

Jeanne Perkins

## Chef/Caterer

Janiele Maffei

## Producer

Susan K. Tubbesing

## Director & Lyricist

Sarah Nathe