



State Of California



## ALFRED E. ALQUIST SEISMIC SAFETY COMMISSION

*Governor Edmund G. Brown Jr.*

Alfred E. Alquist Seismic Safety Commission  
State Capitol, Room 437  
Sacramento, California  
Minutes of Regular Meeting  
June 11, 2015

### **Members Present**

Timothy Strack, Chairman  
Greg Beroza  
Michael Gardner  
Mark Ghilarducci (arrived at 10:08 a.m.)  
Randall Goodwin  
Peggy Hellweg  
Helen Knudson  
Jim McGowan  
Kit Miyamoto (arrived at 11:51 a.m.)  
Ian Parkinson  
David Rabbitt  
Fuad Sweiss (arrived at 10:18 a.m.)  
Mark Wheatley (arrived at 10:09 a.m.)

### **Members Absent**

Tracy Johnson, Vice Chair  
Ken Cooley  
Chet Widom

### **Staff Present**

Richard McCarthy, Executive Director  
Robert Anderson, Engineering Geologist  
Fred Turner, Structural Engineer  
Salina Valencia, Legislative Director

## **I. CALL TO ORDER AND ROLL CALL**

Commission Chairman Timothy Strack called the meeting to order at 10:06 a.m. and welcomed all participants. Legislative Director Salina Valencia called the roll and confirmed the presence of a quorum.

## **II. CHAIRMAN'S REMARKS**

Chairman Strack welcomed everyone to the meeting. He announced that Commissioner Salud Carbajal had resigned and was running for Congress.

## **III. APPROVAL OF APRIL 9, 2015 MEETING MINUTES**

Commissioner Peggy Hellweg reported that she had pointed out several minor typographical corrections to the staff.

ACTION: Commissioner Hellweg made a motion, seconded by Commissioner Michael Gardner, that:

*The Commission approve the minutes of the April 9, 2015 meeting as amended.*

\* Motion carried, 9 – 0 (Commissioners Mark Ghilarducci, Kit Miyamoto, Fuad Sweiss, and Mark Wheatley absent during voting).

#### **IV. THE NEPAL EARTHQUAKE: LESSONS FOR CALIFORNIA**

Dr. Frank Webb, Deputy Manager, Earth Science Research & Formation Office, Jet Propulsion Laboratory (JPL), reported that JPL provided humanitarian and technical aid in response to the magnitude 7.8 earthquake that struck Nepal on April 25, 2015. He said the earthquake caused more than 8,700 fatalities and over 282,000 damaged homes. He noted that JPL worked with the National Aeronautics and Space Administration (NASA) to coordinate response and recovery efforts.

Dr. Webb indicated that the Nepal earthquake was the first real-world test of the newly developed FINDER technology, a portable radar system that response workers can carry in backpacks and use to find people buried in rubble. He said FINDER proved its value in saving lives. He noted that JPL also worked with media representatives to develop appropriate public messaging after the earthquake.

Dr. Webb stated that JPL worked with science agencies around the world to compile satellite data to identify broad-scale ground motion and produce damage and deformation maps that were helpful in prioritizing response efforts. He showed radar images of the affected area before and after the earthquake, and he pointed out particular locations where the earthquake effects were most devastating. He said the United States Geological Survey (USGS) used this data to update shake maps of the region, refine models, predict potential liquefaction and ground failure, and improve future hazards assessment. Dr. Webb added that the affected region is having problems now with landslides and widespread flooding as the result of heavy rains.

Dr. Webb summarized key lessons for California from the Nepal earthquake. He stressed the importance of establishing relationships with response agencies and developing protocols prior to an event, and he noted that damage assessment based on radar images was valuable in planning humanitarian relief. Dr. Webb also recommended using FINDER technology as a tool in future search and rescue missions.

Commissioner Greg Beroza asked if satellite data was available after the first day or if data acquisition required repeat passes by a number of satellites over the affected area. Dr. Webb replied that data from a number of satellite systems was aggregated.

Commissioner Beroza asked if JPL practices its response efforts beforehand by participating in drills such as the statewide Golden Guardian exercise. Dr. Webb responded that JPL participates in regular drills and practice sessions and will continue to do so.

Commissioner Hellweg asked how long it took to obtain good images of the affected area. Dr. Webb said an Italian satellite produced excellent “before” images that were compared with “after” images to identify damaged buildings and affected areas, and more “after” images were available within a day or two. He added that radar images take a bit longer.

Commissioner Gardner asked if FINDER technology works in situations when search dogs and other technology are not available. Dr. Webb stated that FINDER radar can penetrate through 10 feet of rubble, so it works faster and better than using dogs. He added that FINDER was jointly developed by JPL, NSA, and the Department of Homeland Security.

Chairman Strack noted that representatives from the search and rescue teams have been invited to make a presentation at the Commission’s August meeting about their rescue efforts, and more comprehensive information should be available by then.

Executive Director Richard McCarthy reported that he met with JPL representatives in May at the CalOES headquarters to review JPL’s Phase 1 report showing the possible capabilities of its technology for California.

Chairman Strack thanked Dr. Webb and JPL for their efforts.

## **V. SIMULATION-BASED TOOLS FOR UNDERSTANDING AND ENHANCING THE PROCESS OF POST-EARTHQUAKE RECOVERY**

Mr. McCarthy noted that the Commission is sponsoring a project with the Global Earthquake Model (GEM) to develop simulation tools that will identify policies and practices that tend to facilitate post-earthquake recovery. He introduced Dr. Henry Burton, Assistant Professor, University of California at Los Angeles, and GEM researcher, and invited him to discuss the project.

Dr. Burton explained that the purpose of this Commission-sponsored project is to validate the efficacy of certain policies and actions in terms of their effect on post-earthquake recovery. He said GEM will create a simulation model integrated with the OpenQuake software platform that will allow policy-maker users to explore different “what-if” scenarios to determine which policies are most conducive to rapid recovery after a disaster. He noted that GEM is conducting case studies to validate its findings, and the purpose of the simulation tools is to quantify the trajectory of post-earthquake recovery and provide a measure of a particular community’s resilience. Dr. Burton stated that GEM’s research takes specific social and economic characteristics into account in analyzing the cumulative impacts of policies and programs on a given community.

Dr. Burton observed that post-earthquake recovery is a complicated process, and research on the efficacy of policies is still in its infancy. He said GEM’s research focuses on housing and community actions, and he stressed the importance of gathering empirical data to support the simulation model. He then described the key components of the GEM simulation model: 1) The model uses functionality-based data to estimate building damage and quantify building performance; 2) The model allows for dynamic interaction by stakeholders to analyze effects of

their decisions; and 3) The model has the capability of forecasting the time parameters for repairing damage and restoring lifelines, also taking into account socioeconomic factors such as the availability of labor and financing.

Dr. Burton said GEM researchers will continue to work on incorporating the simulation model in the OpenQuake software platform., collecting empirical data from past earthquakes, tailoring the model for specific use in California, and identifying a range of scenario events.

Commissioner Randall Goodwin commented that this project is pertinent and supportive of the Commission's work in revising the guidebook for local governments. He asked if GEM's underlying assumptions in damage estimates were based on applicable construction codes. Dr. Burton replied that GEM researchers rely on HAZUS data and building inventories based on the type and era of construction.

Commissioner Helen Knudson asked if GEM was focusing just on large earthquakes; Dr. Burton responded that the main case study is a magnitude 7.8 event. Commissioner Knudson asked if the research would include smaller events and actions individual homeowners and stakeholders can take. Dr. Burton acknowledged that both individual efforts and government policies were important, and he said the simulation model can be used as a tool to better understand how different policies affect recovery.

Commissioner Mark Ghilarducci observed that this research has many potential applications, including assisting with initial damage assessments local governments need in order to apply for federal disaster assistance. He noted that there were protracted disputes after the Napa earthquake about the meaning of terms such as "major" and "destroyed," because those definitions affected eligibility for Stafford Act funding.

Commissioner Ghilarducci advocated further clarification of the criteria for the use of red and yellow tags in post-disaster building inspections. He said the level of inspection should also be defined, because some types of earthquake damage are not readily visible.

Commissioner Greg Beroza asked if the GEM researchers planned to use the simulation model to identify factors that tend to optimize recovery efforts and recommend specific actions. Dr. Burton responded that the goal of the study is not optimization, but it allows users to change parameters to find out which actions have the greatest effect on recovery, and it provides a multitude of scenarios. Commissioner Beroza expressed his opinion that GEM was ideally positioned to offer advice to the recovery community on these issues. Dr. Burton said GEM can certainly be involved in that process.

Commissioner Hellweg noted that each community has different decision-making considerations and processes, and she asked how users will be able to integrate their data and change the parameters in their scenarios. Dr. Burton recognized that there were elements of uncertainty in the GEM model, including the level of shaking and the level of damage. He stated that GEM intends to provide training workshops for users and will work with individual communities to explore their options.

Chairman Strack thanked Dr. Burton for his presentation.

## **VI. UNIFORM CALIFORNIA EARTHQUAKE RUPTURE FORECAST**

Commissioner Beroza discussed the third update from the Uniform California Earthquake Rupture Forecast (UCERF), the 2014 UCERF3. He explained that UCERF develops official forecasts for the State of California, and this update provides more and better data and improved modeling technology. He said the 2008 UCERF2 had certain weaknesses that have been corrected in the current version. Commissioner Beroza stated that UCERF3 combines various sets of data from fault models, deformation models, and earthquake rate models; incorporates background probabilities using GPS measurements of the earth's crust; and uses a logic tree to identify alternate fault models.

Commissioner Beroza advised that UCERF3 results in new deformation models for the San Diego area, smoothed seismicity for the Redding area in northern California; a more realistic regional event rate for the Sacramento area for earthquakes over magnitude 5; revised scaling relationships for San Francisco, and it incorporates a time-dependent factor in probability models to take triggering and aftershocks into account. Commissioner Beroza noted that earthquake clusters or sequences have been reported after earthquakes in Landers, Turkey, New Zealand, Sumatra, and Nepal.

## **VII. HOSPITAL BUILDING SAFETY BOARD ANNUAL REPORT**

Mr. Chris Tokas, Deputy Division Chief, Office of Statewide Health Planning and Development (OSHPD), presented the annual report of the Hospital Building Safety Board (HBSB) to the Commission. He began by describing the HBSB's purpose, history, and areas of responsibility, and he reviewed the activities of the HBSB's committees.

Mr. Tokas reported that the Instrumentation Committee added three more hospitals to the list of facilities instrumented since 1989, bringing the total to 63. He said OSHPD supplies instruments to about three new hospitals per year, and the building code requires owners of certain hospitals to pay for and install instrumentation.

Mr. Tokas discussed the status of OSHPD's hospital retrofitting program, and presented charts showing the state's inventory of hospital buildings, their seismic rankings, and the status of their compliance with SB 1953, a bill passed in 1994 that required demolition or strengthening of hospital buildings in California. He noted that the state's inventory of SPC-1 buildings, the most hazardous group, has decreased to 314, and he showed a map of their locations. Mr. Tokas reported that HBSB's Structural and Nonstructural Regulations Committee are proposing adding a new category, SPC-4D, to the 2016 version of the California Building Code. He explained that the SPC-4D categories will be used to help SPC-2 buildings upgrade to an SPC-4 level of safety.

Mr. Tokas briefly reviewed some of the training programs and education efforts of the HBSB's Education and Outreach Committee. He advised that the HBSB added a new Technology Committee in 2015.

Chairman Strack thanked Mr. Tokas for his report.

#### **IV. THE NEPAL EARTHQUAKE: LESSONS FOR CALIFORNIA (Continued)**

Chairman Strack welcomed Commissioner Miyamoto to the meeting and invited him to discuss his trip to Nepal.

Commissioner Miyamoto said he arrived in Nepal two days after the April 25 earthquake, which resulted in 8,658 fatalities, over 500,000 houses destroyed, and displacing over 2 million people. He noted that the motion of the earthquake was unique, described as a strong, slow, swinging motion. He showed slides of some damaged buildings and observed that there was also considerable nonstructural damage.

Commissioner Miyamoto showed pictures of high-rise condominium buildings constructed recently in Katmandu. He noted that these buildings met the life-safety building code, and only one person died as the result of a building failure. He added that there were problems with nonductile concrete buildings, brick buildings, and rock buildings constructed without mortar, and similar issues have been identified in California and elsewhere.

Commissioner Miyamoto remarked that the people of Nepal will rebuild, but they need technical advice and knowledge regarding construction of schools and high-rise buildings, enhanced repair of walls, shear walls, dampers, and new technology. He noted that society expects more than life safety, but people do not understand that meeting the building code does not mean buildings are earthquake-proof. He showed pictures of metal shacks being used as temporary shelters, and he expressed concern that the upcoming monsoon season will create new problems.

Commissioner Gardner asked whether the temporary shelters are on government property or private land. Commissioner Miyamoto answered that the shelters in Katmandu are mainly on government-owned property, but shelters in outlying villages tend to be on private land.

Commissioner Beroza commented that Commissioner Miyamoto's presentation was frightening, but that people already knew the "lessons" the earthquake revealed. He questioned whether this event will change public awareness. Commissioner Miyamoto said making people understand the building code provides a minimum level of life safety and having a disaster insurance program in place would be most helpful. He noted that developers would be able to market stronger buildings as more earthquake-resistant, and buildings might have more of an incentive to go beyond the code minimums.

#### **VIII. GUIDE TO IDENTIFY AND MANAGE SEISMIC RISKS OF BUILDINGS FOR LOCAL GOVERNMENTS**

Commissioner Goodwin referred to the latest draft of the Commission's guidebook for local governments regarding managing high-risk buildings. He said the manual is designed to assist elected officials and local government executives with suggestions for developing appropriate policies. Commissioner Goodwin noted the current version is the 14<sup>th</sup> revision, and it incorporates comments submitted by Commissioner Miyamoto and others.

Commissioner Goodwin highlighted the changes in the present draft. He noted the title was changed to eliminate the reference to “collapse-prone,” and the new title is “Guide to Identify and Manage Seismic Risks of Buildings for Local Governments.” He requested Commission approval to move ahead with graphic and editorial work so the document can be released.

Commissioner Wheatley said he liked the graphics and the inclusion of success stories, and he asked about the possibility of including a North Coast jurisdiction as an example. Commissioner Goodwin and Mr. Turner expressed interest in that idea, and they welcomed a follow-up discussion with Commissioner Wheatley after the meeting.

**ACTION:** Commissioner Hellweg made a motion, seconded by Commissioner Knudson, that:

*The Commission authorize the committee and staff to finish the document and have it published.*

\* Motion carried, 10 – 0 (Commissioners Parkinson, Rabbitt, and Strack absent during voting; Mark Johnson voting for Commissioner Ghilarducci).

## **IX. LEGISLATIVE UPDATE**

Legislative Director Salina Valencia advised that the Commission staff was monitoring three bills, SB 494 (Hills), creating a fund for the earthquake early warning system; AB 81 (Wood), extending a hospital seismic safety deadline; and SB 702 (Monning), providing funds for a voluntary new financing tool for the California Earthquake Authority. She clarified that the Commission does not adopt positions on pending legislation, but provides technical support and advice as requested.

Ms. Valencia noted that the Legislature has until midnight on June 15 to pass the state budget bill, and the governor needs to sign the bill by July 1.

Ms. Valencia observed that in response to California’s fourth year of drought, and Governor Brown issued an executive order on April 1 mandating substantial reductions in water usage. She said there are a number of other water-saving campaigns, and the state is allocating funds for emergency drought response legislation and expediting grants for water conservation projects.

## **X. EXECUTIVE DIRECTOR’S REPORT**

### **Budget**

Mr. McCarthy drew attention to the latest budget projections. He noted that Contracted Fiscal Services is projecting a small year-end deficit at this point, but the actual figure will probably be less. He reported that the Commission received invoices for its work for the San Francisco Public Utilities Commission, the Diablo Canyon independent review panel, and on the Napa earthquake, and there is a small amount in unbilled research overhead costs being kept as a

reserve. Mr. McCarthy said he planned to wait 10 days and recalculate the figures, and he asked the Commission to authorize the staff to send an invoice to the Controller for the deficit amount.

**ACTION:** Commissioner Knudson made a motion, seconded by Commissioner Wheatley, that:

*The Commission authorize the staff to forward the invoice as proposed.*

\* Motion carried, 11 – 0 (Commissioners Parkinson, Rabbitt, and Strack absent during voting).

Mr. McCarthy said he would send revised projections to all commissioners.

Mr. McCarthy advised that the Commission asked Agency representatives to review the 2015-16 budget projections, and this topic will be discussed in more detail at the August meeting. He added that the staff will need to begin work soon in order to develop a budget change proposal (BCP) for 2016. He recommended that the Commission authorized the staff to develop a BCP if necessary, working with the Commission Chairman and Vice Chair.

**ACTION:** Commissioner Wheatley made a motion, seconded by Commissioner Hellweg, that:

*The Commission authorize the staff to develop a BCP as proposed.*

\* Motion carried, 11 – 0 (Commissioners Parkinson, Rabbitt, and Strack absent during voting).

Commissioner Hellweg clarified that the Commission would not be seeking any funds from the state general fund, but only from the Commission's existing funding source, the Insurance Fund. Mr. McCarthy confirmed that understanding.

### **Filling Vacant SSM I Position**

Mr. McCarthy reported that the Commission was developing a job description and justification for filling the vacant SSM I position. He added that he hoped to interview candidates in July and have someone on board by August 1.

### **Renew Commission Webpage Contract**

Mr. McCarthy said the Commission renewed its Webpage maintenance contract with the University of California at San Diego (UCSD). He noted that Mr. Michael Kleeman, UCSD, will be making a presentation at the October meeting, and there might be a way of transferring unused funds from that project to the Website contract.

## **California State Fair: Earthquake Exhibit**

Mr. McCarthy said the Commission is assisting with a preparedness exhibit at the California State Fair at Cal Expo that will feature a portable shake table and demonstrations for kids.

### **XI. PUBLIC COMMENT**

Ms. Annie Kell, new outreach coordinator for the Nevada Seismological Lab, introduced herself and said she looks forward to working with the Commission. Mr. McCarthy welcomed Ms. Kell and noted that the Commission is looking for joint projects with Nevada.

### **XII. MISCELLANEOUS AND GOOD OF THE MEETING**

Mr. McCarthy reminded commissioners to submit their expense claim forms to Ms. Sue Celli by June 15 so those expenses can be figured in the year-end budget totals.

Mr. McCarthy noted that the August 13 meeting might be held telephonically, and he said the staff will let commissioners know as those plans develop.

Commissioner Ghilarducci reported that the earthquake early warning working group is now working on a cost-benefit analysis. He said Mark Johnson met the previous day with telecom industry representatives who expressed concern about converting and integrating existing systems versus a ground-up approach.

Commissioner Ghilarducci noted that he would be attending meetings the following week with the new Japanese consul general, Secretary Anna Caballero, and representatives from Japanese business associations. Commissioner Hellweg expressed interest in attending those meetings to discuss the early warning system.

Commissioners congratulated Commissioner Gardner on his re-election on June 2.

Commissioner Wheatley noted that immediately after the Commission meeting in Arcata on October 8, the Cascadia Project is holding three days of workshops that might be of interest to commissioners.

**XIII. ADJOURN**

There being no further business, the meeting was adjourned at 1:01 p.m.

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Sue Celli  
Office Manager

Approved by:

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Richard McCarthy  
Executive Director