



State Of California

ALFRED E. ALQUIST
SEISMIC SAFETY COMMISSION



Governor Edmund G. Brown Jr.

Alfred E. Alquist Seismic Safety Commission
State Capitol, Room 447
Sacramento, California
Minutes of Meeting
May 9, 2013

Members Participating

Michael Gardner, Chairman
Mark Pazin, Vice Chairman
Ellen Corbett (arr. 10:39 a.m.)
Mark Elsesser
Peggy Hellweg
Helen Knudson
Mark Ghilarducci
Emir Macari (arr. 10:47 a.m.)
Jim McGowan
Kit Miyamoto (arr. 10:06 a.m.)
Timothy Strack
Chester Widom (arr. 10:07 a.m.)

Staff Present

Richard McCarthy, Executive Director
Karen Cogan, Administrative Manager
Robert Anderson, Senior Engineering Geologist
David King, Legislative & Special Projects Mgr
Henry Reyes, Special Projects Manager
Fred Turner, Structural Engineer

I. CALL TO ORDER/ROLL CALL

Chairman Michael Gardner called the meeting of the Alfred E. Alquist Seismic Safety Commission to order at 10:04 a.m. and welcomed all participants. Administrative Manager Karen Cogan called the roll and confirmed the presence of a quorum.

II. CHAIRMAN'S REMARKS

Nominations Committee Report

Commissioner Helen Knudson suggested deferring the Nominations Committee Report until Commissioner Emir Macari was present, and Chairman Gardner agreed.

III. APPROVAL OF MARCH 14, 2013 MINUTES

Chairman Gardner said he had provided some minor typographical corrections to the staff.

ACTION: Commissioner Jim McGowan made a motion, seconded by Commissioner Helen Knudson, that:

The Commission approve the minutes of the March 14 meeting as amended.

* Motion carried, 8 – 0 (Commissioners Corbett, Macari, Miyamoto, and Widom absent during voting).

IV. EXECUTIVE DIRECTOR'S REPORT

Budget Status – FY 2012/13

Legislative and Special Projects Manager David King advised that the Commission's budget was in good shape for the rest of this fiscal year. He said the staff will work closely with General Services to ensure no last-minute shortfalls occur.

Commission Funding for FY 13/14 (Trailer Bill)

Mr. King reported that the trailer bill providing a permanent funding source for the Commission had been heard by an Assembly committee and was being revised to add Senate-requested language. He noted that any remaining questions will be addressed after the May revised budget is released.

Mr. King said the Commission staff worked hard this year to garner industry support for the bill. He added that legislators have ongoing concerns about avoiding duplicative functions, unfunded mandates, and excessive regulation, but he expressed confidence that the trailer bill will eventually be approved.

Navy Tsunami Hazard Project

Executive Director Richard McCarthy noted that he described this joint project with the U.S. Navy's Third Fleet at the Commission's meeting in Riverside last fall. He said the Navy will submit a proposal to its funding board for identification of tsunami hazards and development of emergency procedures within San Diego Bay. Mr. McCarthy advised that Cal-EMA, the California Geological Survey (CGS), and the Commission, are all working on tsunami risk reduction projects for harbors throughout California. He added that he would have more to report at the July meeting.

Totally Unprepared Phase II Quarterly Report

Mr. McCarthy referred to the written update in the meeting packet. He commented that the campaign has developed an interesting program, and the focus is now on disseminating the products created in Phase I.

Agenda Highlights

Mr. McCarthy pointed out that several important projects and topics were on this meeting's agenda, including the upcoming dive at Lake Tahoe, the San Francisco Public Utilities Commission (SFPUC) Water System Improvement Project, and proposals from the Global Earthquake Model (GEM).

Mr. McCarthy advised that the staff had been discussing long-term post-disaster recovery issues with the state's GoBIZ organization. He said Dr. Sumner would be on hand at the July meeting to discuss his research about the vulnerability of California's agricultural sector.

Chairman Gardner commented that the Totally Unprepared Phase II campaign involves outreach to minority communities to deliver this important information in an easy-to-understand way.

V. UPDATE ON EARTHQUAKE EARLY WARNING WORKING GROUP

Commissioner Mark Ghilarducci reported that the state continues to explore ways of creating a more robust and accessible earthquake warning system for the state. He clarified that the system should be viewed as a vehicle for disseminating alerts rather than "early warnings." He observed that the desired outcome would build on existing infrastructure such as the California Integrated Seismic Network (CISN) to connect with proprietary systems developed in the commercial marketplace. He said the network will produce a data set that will be helpful for business owners and policy leaders. Commissioner Ghilarducci expressed his opinion that such a system could have lifesaving impacts on the resiliency and economy of affected areas.

Commissioner Ghilarducci said a working group has been established to formulate recommendations that will lead to a more robust system in California. He noted that the working group has held three meetings, and there has been good dialogue between public and private stakeholders. He advised that the working group is talking about ways to market and develop effective messages for different audiences. He said determining how alerts will be disseminated and how fast is a major policy issue that will need to be addressed, and the working group is looking at new technologies to facilitate those functions.

Commissioner Ghilarducci noted that the next meeting of the working group is scheduled for June. He added that the working group has a six-month timeframe to bring recommendations forward that will create a robust public-private integrated alert system for California.

Commissioner Ghilarducci acknowledged the importance of preparing. He noted that implementation of an alert system in California will entail working with the public to manage

their expectations, encourage preparedness, and help people know what to do when they receive an alert.

Chairman Gardner thanked Commissioner Ghilarducci for the update.

VI. UPDATE ON DIABLO CANYON AND SAN ONOFRE NUCLEAR POWER PLANT INDEPENDENT REVIEW PANELS

Mr. Chris Wills, California Geological Survey, discussed the background and work of the independent peer review panels dealing with the seismic safety of the Diablo Canyon and the San Onofre nuclear power plants. He noted that AB 1632 (Blakeslee) called for a California Energy Commission study that involved three-dimensional imaging to identify off-shore faults and possible threats to the power plants. The utilities requested money to conduct the research, and the California Public Utilities Commission (CPUC) authorized funds and established the peer review panels.

Mr. Wills said the Tohoku earthquake and tsunamis occurred during the time Pacific Gas & Electric (PG&E) was pursuing relicensing of the Diablo Canyon plant through the Nuclear Regulatory Commission (NRC). In response, the NRC requested a re-evaluation of the plant's seismic safety.

Mr. Wills reported that the independent peer review panel has been meeting since September of 2011 to address the seismic testing required for the Diablo Canyon facility. He said PG&E produced a sensitivity study with a map of faults that identified the off-shore Hosgri Fault and other nearby faults as targets for a more detailed investigation. PG&E proposed low-energy three-dimension surveys of particular faults, along with a series of high-energy tests of certain specific sites, but the Coastal Commission denied the permit application due to concerns about the effects of high-energy testing on marine life. Mr. Wills stated that PG&E must now find some other way to conduct its studies or go back to the Coastal Commission with a revised proposal if the information can be obtained no other way.

Mr. Wills advised that the San Onofre Nuclear Generation System (SONGS) operated by Southern California Edison is undergoing a similar process of review. He said a series of off-shore and on-shore studies in a phased approach are being proposed. Mr. Wills displayed a diagram showing faults in the area. He reported that two models have been developed to forecast likely seismic events, but no permits have been issued.

Mr. Wills clarified the purpose of the peer review panels is to help PG&E reduce uncertainties by doing a better job of hazard analysis. After that, the regulatory agencies will have to analyze social, political, and economic factors as part of the ultimate decision.

Mr. Wills stated that California Geological Survey has reviewed and analyzed existing studies to determine how the results would change under various scenarios, and there is a possibility that the hazard would be higher than the design level under a worst-case scenario. He added that geologists do not even know whether the imaging proposed by PG&E could be done, so there could be as many unknowns at the end of testing as there are now.

Commissioner Corbett stated that she held hearings after the Japan disaster and heard testimony from experts about their concerns and the importance of a thorough hazard analysis. She remarked that there is a difficult clash between public safety and environmental concerns.

Chairman Gardner noted that if experts conclude that high-energy studies are critical, the Legislature can step in and overrule the Coastal Commission. He thanked Mr. Wills for the update.

II. CHAIRMAN'S REMARKS (Continued)

Nominations Committee Report

Commissioner Emir Macari reported that the Nominations Committee solicited letters of interest from commissioners interested in serving as chair or vice chair, and then committee members conferred by telephone and email. He advised that the committee recommends keeping the current slate of officers for another year.

Chairman Gardner asked if there were any other nominations from the floor, but there were none.

ACTION: Commissioner Widom made a motion, seconded by Commissioner Knudson, that:

The Commission elect Commissioner Gardner Chair and Commissioner Mark Pain Vice-Chair for 2013-14.

* Motion carried, 11 – 0 – 1 (Commissioner Strack absent during voting).

VII. HOSPITAL BUILDING SAFETY BOARD ANNUAL REPORT

Mr. Chris Tokas, Deputy Division Chief, Office of Statewide Health Planning & Development (OSHPD), presented the Hospital Building Safety Board's 2012 Annual Report. He explained the purpose and activities of OSHPD's Facilities Development Division, including its advisory group, the Hospital Building Safety Board. Mr. Tokas described the composition of the Board and its committees. He said the Board has a number of committees to deal with its major areas of concern, and he identified each committee. Mr. Tokas then provided a summary of the activities of the Board's Instrumentation Committee and its Structural and Nonstructural Regulations Committee.

Mr. Tokas reported that the Instrumentation Committee works to identify candidate hospital buildings for seismic instrumentation to provide information that can affect future building code provisions and hospital safety. He displayed lists of hospitals buildings that will be instrumented by their building owners over the next two years, and a list of candidates of OSHPD-supplied instrumentation. He added that OSHPD has enough funds to instrument at least two candidate hospitals each year.

Mr. Tokas said the Hospital Building Safety Board's Structural and Nonstructural Regulations Committee has been working on amendments to the 2013 building code; In addition, the committee reviews Code Application Notices (CANs) and Policy Intent Notices (PINs) that interpret code provisions; assists with development guidelines for alternative deep foundations and soil improvement systems; helps seismic certification and identifying candidate components for future certification; helps clarify NPC-3 requirements; proposes California amendments reflecting adoption of new seismic hazard maps, seismic certification of nonstructural components, and synchronization with national standards.

Mr. Tokas discussed the activities of the Hospital Building Safety Board's Education and Outreach Committee. He said the committee is working to identify the training needs of its stakeholders, and then developing seminars on topics including OSHPD's Best Practices Manual, SB 499, SB 90, standard details, the meaning of "materially alter," special seismic certification, E-Portal services, OSHPD 3 clinic regulations, and 2013 code changes.

Mr. Tokas reported that the Hospital Building Safety Board heard no appeals in 2012. He displayed charts showing the results of the SB 499 reports submitted by hospitals to identify their compliance plans for their most vulnerable SPC-1 buildings, and results of the SB 90 applications for extensions based on financial hardship, community access issues, or seismic risk.

Chairman Gardner thanked Mr. Tokas for the report.

Mr. Tokas noted that OSHPD encourages mobile emergency field hospitals. Commissioner Macari expressed support for mobile facilities. He noted that California currently has three emergency management field hospitals available to provide relief.

Commissioner Corbett asked if members of the public can find out how individual facilities have been rated. Mr. Tokas replied that OSHPD posts hospitals' SB 499 reports on the Website, and that information includes individual building ratings reflecting the probability of collapse. He offered to forward a link to the Commission staff.

Chairman Gardner thanked Mr. Tokas for his report.

VIII. GLOBAL EARTHQUAKE MODEL (GEM) PROJECTS

Ms. Kate Stillwell, Scientific Board Management/Product Strategy, Global Earthquake Model (GEM), noted that when the Commission met in March, commissioners expressed interest in pursuing two GEM projects, one to improve recovery modeling and another to identify the assumptions used in commercial models.

Back to Normal: Earthquake Recovery Modeling

Ms. Stillwell said the purpose of the “Back to Normal” project is to model recovery time to identify actions that reduce recovery time after a disaster. She explained that this research incorporates a scientific approach to recovery models by using quantitative methods to estimate damage and test the effectiveness of various policies and actions. Ms. Stillwell noted that there are various types of pre-earthquake mitigation policies, ranging from tax incentives and loans to planning and insurance, and there are also various types of users, ranging from policy analysts to disaster risk managers to insurance companies. She observed that this project will include development of a framework for analysis, a retrofit cost-benefit tool, case studies, software to validate and implement the methodologies to be used, and a series of training workshops for users.

Ms. Stillwell requested \$440,000 from the Seismic Safety Commission to fund this project, with a 50 percent match from private sponsors.

Impact of Assumptions on Earthquake Model Results

Ms. Stillwell said the second project, called “Beyond Button Pushing,” is intended to identify the impact of the assumptions underlying existing commercial models. She indicated that GEM is creating an open-source software program as a common language and bridge to address the lack of transparency in most proprietary models. She noted that this research will help quantify what factors are still unknown and help to understand the consequences of the unknowns. Ms. Stillwell stated that end products will include a report and a series of best practice guidelines. She requested \$181,000 from the Seismic Safety Commission, augmented by a 33 percent match from private sponsors.

Commissioner Miyamoto commented that government policies and the availability of insurance can make a substantial difference in recovery time, and he cited the 1995 Kobe earthquake and the 2010-11 earthquakes in New Zealand as examples of extremely slow recovery. He remarked that California’s last major earthquake was in 1906, so people here are really not prepared for a major event. Commissioner Miyamoto observed that having insurance coverage and money to rebuild can make a huge difference in recovery. He pointed out that less than 10 percent of the homes in California have earthquake insurance, compared with 20 percent in Japan and 80 percent in New Zealand, and many people are reluctant to buy earthquake insurance because of the high premium cost and high deductibles.

Commissioner Miyamoto expressed support for this project as a way of developing guidelines about what policy makers can do now to improve recovery chances later. He said the results of this research can be extremely useful to the Department of Insurance, the insurance industry, and individual consumers.

Commissioner Chet Widom asked if the proposal could be customized to include investigation of all state-owned buildings or all public schools. Ms. Stillwell responded that users can import any specific set of data they want to incorporate in the models. She said GEM’s goal is to create an easy-to-use system that will work on various interfaces. Commissioner Widom recommended

using California schools and state-owned buildings as part of the model, and Ms. Stillwell confirmed that those data sets could be incorporated.

Commissioner Macari asked for more details about funding arrangements. Ms. Stillwell said GEM hopes to receive \$440,000 from the Commission for the first project and \$181,000 for the second, for a total of \$620,000 from the Commission. She clarified that this is a single, one-time request, and she added that GEM may come to the Commission in the future with other relevant projects. She noted that the meeting packet contains more detailed itemized budgets for both of the proposed projects. Ms. Stillwell added that GEM already has the matching funds from private sponsors, so the projects can move forward as soon as the Commission allocates its funds.

Commissioner Macari asked how much GEM charges for countries to join the organization. Ms. Stillwell stated that GEM charges a sliding scale based on a country's research and development expenditures; she estimated that average fee is \$350,000.

Commissioner Hellweg asked if the results of these studies will be pertinent to California. Ms. Stillwell said the projects will incorporate both California-specific exposure sets and worldwide data. Commissioner Hellweg emphasized the importance of identifying remediation measures that are politically realistic. Ms. Stillwell replied that GEM will work closely with the Commission to make sure these goals are met.

Senior Engineering Geologist Bob Anderson said the staff will prepare California building stock data in conjunction with the Division of the State Architect, GEM, and the principal investigators. Commissioner Widom asked how much staffing time the Division of the State Architect would need to devote to this effort. Ms. Stillwell estimating the developing data sets might take one or two person-weeks, and sharing the data would require another one or two person-months.

Mr. McCarthy advised that the Commission still has approximately \$4 million available in its research fund for these kinds of projects. He cautioned that the Department of General Services' legal review might take up to six months. He said the staff will send commissioners a first draft of the proposed contracts.

Commissioner Elsesser asked about the possibility of including a California researcher in the project. Ms. Stillwell noted that GEM is an international collaboration, and she confirmed GEM's ability to either find a California-based collaborator or develop a separate scope of work for a California researcher. She stated that there are already California university faculty members and Ph.D. students involved with the project. Commissioner Miyamoto strongly urged GEM to include a California researcher.

ACTION: Commissioner Knudson made a motion, seconded by Commissioner Miyamoto, that:

The Commission approve the funding requests for both projects.

Commissioner Widom proposed a friendly amendment to incorporate a proviso that California public schools and state buildings will be included as a data set for testing the models. Commissioner Knudson and Commissioner Miyamoto accepted this amendment.

* Motion carried, 12 – 0.

Commissioner Macari commented that he and Mr. McCarthy had been working to encourage Mexico to participate in GEM. He stressed the importance of creating some incentive or articulating a benefit that might spur Mexico and other countries to join. Ms. Stillwell stated that a relationship with Mexico would provide mutual benefits for GEM and Mexico. She advised that GEM is currently overhauling its public participation scheme, and part of that process will be revising the sliding fee scale and identifying tangible benefits of membership. She offered to share GEM's materials, and Commissioner Macari thanked her for her assistance.

Chairman Gardner thanked Ms. Stillwell for her presentation.

IX. LAKE TAHOE HAZARD SURVEY UPDATE

Dr. Gordon Seitz, California Geological Survey, gave a progress report on the Commission-funded research project to survey the bottom of Lake Tahoe using a remotely operated submarine. He explained that this work will result in much better scientific information about the fault and landslide potential of the Lake Tahoe Basin. Dr. Seitz said the remotely operated submarine, being constructed by DOER Marine in Alameda, will eventually be taken to Antarctica to study the effects of global warming on the Ross ice shelf there.

Dr. Seitz displayed a map of Lake Tahoe and pointed out areas where landslides and earthquakes have taken place in the past. He noted that a mega-landslide about 2500 years ago produced waves as high as 100 meters. He advised that the initial targets of the survey had changed a bit, with greater focus now on the fault along the west side of Lake Tahoe. Dr. Seitz reported that surveys of this area have yielded important information about slip rates and displacement measurements. He noted that the survey of Lake Tahoe will lead to fault zonation along the California-Nevada border and will allow scientists to create more accurate seismic hazard maps and inundation scenarios.

Dr. Seitz showed slides and a video illustrating how the remotely operated vehicle deploys and unfolds once it is lowered through a narrow hole. He said the remotely operated vehicle will be ready to ship to Antarctica in late summer.

Chairman Gardner thanked Dr. Seitz for the update.

XII. SAN FRANCISCO PUBLIC UTILITIES COMMISSION WATER SYSTEM IMPROVEMENT PROGRAM DELAY LETTER (Out of Order)

Structural Engineer Fred Turner referred to the draft letter to the Joint Legislative Audit Committee under Tab 12 of the meeting packet. He noted that the Commission is charged with commenting on the impacts of the 25-month delay on water delivery and reliability, and the letter

details a number of issues and concerns. Mr. Turner noted that because of the need to redesign the steep hill slope at the Calaveras Dam, the costs of the project have increased, and the resulting delays will affect the level of service goals and the sustainability of the water supply if a drought occurs during the construction period.

Mr. Turner recommended that the Commission approve the letter and authorize the staff to forward it to the Joint Legislative Audit Committee.

Commissioner Macari reported that he visited the site last year and was able to view the work in progress. He expressed his opinion that the project engineers should have foreseen the need to address the steep slope from the beginning of the project. He observed that delaying the work increases the risk to public safety, and he said he felt strongly that the public should be informed. He recommended approving the draft letter.

Commissioner Strack agreed. He added that he was impressed with the tremendous pace of work at the site and believed the SFPUC was doing its best to fix the problem.

ACTION: Commissioner Macari made a motion, seconded by Commissioner Strack, that:

The Commission approve the draft letter to the Joint Legislative Audit Committee as proposed.

* Motion carried, 10 – 0 – 2 (Commissioners Ghilarducci and Widom absent during voting).

X. PREPAREDNESS LESSONS FOR HOSPITALS FOLLOWING RECENT DAMAGING POST-EARTHQUAKE EVENTS

Mr. Turner drew attention to the written report summarizing the results of a Commission-sponsored preparedness survey of hospitals in Mexico, El Centro, and New Zealand. He said the Commission contributed \$49,000 to work with the Pacific Earthquake Engineering Research (PEER) Center to identify their planning processes and evacuation policies. He noted that the survey found several recurring themes: the importance of an effective emergency communications system, back-up power, waste removal, and addressing nonstructural damage.

Mr. Turner reviewed and discussed the five recommendations in the handout titled “Comparative Study”:

- Hospitals should educate and train their staff so they understand the effects of prior retrofits and risk assessments and avoid overreacting to a disaster;
- Hospitals should maintain a functioning back-up power system and make plans to surge particular functions to other buildings;
- There should be a greater emphasis on mutual aid between hospitals in an affected region;
- Hospitals need to have more flexible emergency operations plans that include pre-identified alternatives and fallbacks the staff should consider before evacuating patients;
- Hospitals should develop a decision tree to prioritize vulnerable functions.

Mr. Turner suggested that Mr. Roger Richter, California Hospital Association, consider making a presentation on the survey results at CHA's conference in September.

Chairman Gardner thanked Mr. Turner for his report. He recommended that commissioners read the complete written report on the survey results and forward comments and questions to Mr. Turner.

XI. HOSPITAL FIRE TEST PROJECT UPDATE

Mr. Turner reported that a number of findings have been emerging from the Commission-sponsored research regarding post-earthquake fire damage in hospitals. He noted that the Commission contributed \$370,000 for shake testing of a five-story building by the University of California at San Diego, including \$50,000 for a more in-depth fire study. He said the effect of shaking damage on post-earthquake fires in hospitals has not been previously studied, so the results will help inform future building code provisions.

Mr. Turner observed that the current building code is focused on limited fire-induced structural failure, but hospital buildings are more complicated because both structural and nonstructural damage to hospital buildings can allow fire to spread more rapidly. He noted that current code provisions pertaining to fire compartments, fire doors, and building separations assume there will be no shake damage.

Mr. Turner drew attention to the findings of the fire study:

- Earthquake damage can cause a loss of compartmental integrity. Structures like door frames, hinges, stairways, and pipes can become dislodged and impair egress and access.
- Damage causing walls to detach accelerates the spread of smoke and fire;
- In some cases, concrete frame spalling exposed reinforcing steel;
- There were some duct failures and gaps, and certain ventilation conditions can cause a "chimney" effect, drawing smoke from one area to another; and
- In general, sprinklers, smoke detectors, and fire dampers performed well.

Mr. Turner stated that the main recommendation of the study is further testing in more real-life situations involving water and medical gas, for example. He pointed out that more formal reports on these issues are likely to lead to new regulations.

Chairman Gardner thanked Mr. Turner for his presentation.

XIII. FIRE FOLLOWING EARTHQUAKE REPORT (PHASE II)

Special Projects Manager Henry Reyes reported that he met with Dr. Charles Scawthorn for an update on Phase II activities. He explained that the main purpose of this work is to improve coordination between fire departments and water districts in key urban communities. Mr. Reyes said Dr. Scawthorn had arranged meetings with fire departments in April, and he made a presentation to the FireSCOPE board of directors on April 10. Dr. Scawthorn planned additional meetings throughout April and May with key water districts. Mr. Reyes stated that Dr.

Scawthorn expected to finalize performance goals by June, finish the report by the end of June, post results on the Website, and then make a presentation to the Commission in July.

Chairman Gardner thanked Mr. Reyes for his report.

XIV. LEGISLATIVE UPDATE

Mr. King noted that the Commission had already discussed SB 135, the proposal for an early warning system, which had been sent to suspense. He reported that AB 355 (Cooley), pertaining to mobile hospital facilities, was also sent to suspense.

XV. PUBLIC COMMENT

There were no members of the public who wished to address the Commission.

XVI. GOOD OF THE MEETING

There were no other items brought to the Commission's attention.

XVII. ADJOURNMENT

There being no further business, the meeting was adjourned at 1:17 p.m.

Sue Celli
Office Manager

Approved by:

Richard McCarthy
Executive Director