California Seismic Safety Commission
Minutes of Commission Meeting

July 13, 2017

I. CALL TO ORDER AND ROLL CALL

Chairman Gardner called the meeting to order at 10:04 a.m. Room 437, California State Capitol Sacramento, California

ROLL CALL:

Michael Gardner, Chairman
Vice-Chair Tracy Johnson
Ryan Arba (for Mark Ghilarducci)
Randall Goodwin
James Hackett (for Chet Widom)
Jorge Menesis
Kit Miyamoto
Ian Parkinson
David Rabbitt
Cindy Silva
Timothy Strack
Ed Valenzuela
Ivan Wong

Anthony Cannella (ABSENT)
Mia Marvelli (ABSENT)
Fuad Sweiss (ABSENT)
Andy Tran (ABSENT)

Swearing-In of New Commissioners

Chairman Gardner welcomed and congratulated newly appointed Commissioners Ivan Wong, a seismologist; Cindy Silva, representing local governments; Jorge Menesis, geotechnical engineer; Ed Valenzuela, representing local governments; and Andy Tran, insurance representatives. He said he, Commissioner Ian Parkinson, Commissioner David Rabbitt, and Commissioner Tim Strack had been reappointed.

Executive Director McCarthy administered the oath of office to the new and reappointed Commissioners.

II. CHAIRMAN'S REMARKS

For the benefit of the new commissioners, Chairman Gardner asked all Commissioners to introduce themselves and give brief descriptions of their backgrounds. Commissioners took turns introducing themselves.

Chairman Gardner expressed his appreciation to former Commissioners Helen Knudson, Peggy Hellweg, and Mark Wheetley for their service and contributions to the Commission and the people of California.

Chairman Gardner observed that for the first time in several years, the Commission has a full Commission.

Comments or Questions from the Commissioners
No comments or questions from the Commissioners

Comments or Questions from the Public
No comments or questions from the Commissioners

III. PARTNERSHIP: REDUCING EARTHQUAKE RISK IN MEXICO AND CALIFORNIA

Chairman Gardner introduced Ms. Liliana Ferrer, Consul General of Mexico. Executive Director, Mr. McCarthy noted that the Commission has had a long relationship with the Mexican Consulate in Sacramento, and representatives from the Consulate have made presentations to the Commission on a variety of topics. He said the value of this partnership was highlighted after the 2010 earthquake in Baja California that caused damage on both sides of the border.

Mr. McCarthy said the Commission is currently working on a project with the Japanese Consulates in San Francisco and Los Angeles and Japanese business groups to survey Japanese companies doing business in California to identify recovery issues and business recovery needs. He noted the survey will also gather information on the experience of Japanese businesses with the earthquake early warning system in Japan. He advised that Mexico also has an earthquake early warning system in place, so there are lessons to be learned from Mexico's experience as well.

Mr. McCarthy proposed that the Commission complete its survey of Japanese businesses and include Mexico as a partner in that effort. He said the business recovery recommendations identified in the survey will then be forwarded to the Agency, Governor's Office, and Legislature for consideration.

Mr. McCarthy said California's Lieutenant Governor announced in January that he intended to re-establish the Commission of the Californias, an entity that was discontinued during Governor Schwarzenegger's administration. He explained that the purpose of the Commission of the Californias is to promote cooperation between California and Baja California in solving mutual problems, increasing business, and facilitating commerce across the border. He recommended that the Commission take advantage of this opportunity to develop some projects that will benefit both countries. He welcomed Consul General Ferrer and invited her to address the Commission.

Consul General Ferrer noted that Mexico has an important trading partnership with California, importing many California products and providing over 6,000 jobs dependent on these purchases. She observed that Mexico has a history of collaboration with California, and she welcomed an opportunity to strengthen this relationship, especially in strategic areas such as post-disaster recovery and emergency response.

Consul General Ferrer stated that she was posted at the Los Angeles Consulate during the Northridge earthquake and saw firsthand how the City of Los Angeles collaborated with the Japanese Consulate, the Korean Consulate, and the Mexican Consulate at that time. She said she was born in Mexico City and is well aware of the challenges Mexico faces because of its own earthquake experience. She added that California and Mexico both have a great deal to contribute to each other in terms of lessons learned.

Consul General Ferrer described some of Mexico's experience in disaster management. She noted that because of its geographic location, Mexico is subject to a wide range of natural phenomena that have caused major natural disasters, so Mexico has gained considerable experience in disaster management, including prevention, mitigation, preparation, response, rehabilitation, and reconstruction. She said Mexico frequently participates in responding to earthquake disasters in various parts of the world.

Consul General Ferrer stated that Mexico's Ministry of the Interior coordinates disaster management efforts through a national center that aims to promote application of technologies in disaster prevention and mitigation. She said the national center offers professional and technical training, disseminates preparedness and self-protection advice to communities affected by disasters, and provides funds to deal with the effects of natural disasters. At a state and local level, she noted, there are councils that participate in disaster prevention and public preparedness.

Consul General Ferrer said the Mexican government and Mexican research institutes have worked together to create an earthquake early warning system to protect its citizens. She indicated that the seismic warning system is operated by the Center for Instrument and Seismic Survey, and it covers the coastal area and the region around Mexico City. She explained that the seismic early warning system sends alarms as soon as two of the hundred sensors along the Pacific coast detect an earthquake of magnitude 6.0 or larger; and the alerts travel faster than the telluric waves, allowing Mexican citizens to take safeguarding precautions before an earthquake strikes. Consul General Ferrer stated that Mexico also has a tsunami warning system to alert affected populations minutes before a tsunami happens on the Pacific coast and hours before a trans-Atlantic tsunami hits.

Consul General Ferrer noted that the U.S. and Mexico share the largest border between a developed and a developing country in the world, and cross-border trade is vitally important to both countries. She said the California-Mexico border is one of the busiest in the world, with over 120 passenger vehicles, 63,000 pedestrians, and 6,000 trucks crossing daily. She stated that over $42 billion worth of goods are imported and exported, and the estimated value of trade between San Diego and Mexico exceeds $4 billion per year, valued at over $2 million daily. Consul General Ferrer emphasized the need to keep the border secure to preserve this very important relationship.

Consul General Ferrer said Baja California already participates in many kinds of collaboration and exchange involving medicine, medical tourism, the arts, the environment, epidemiology, and security. She noted that the border crossing point and customs inspection facilities were upgraded this year to incorporate high technology. She invited the Commission to come to the border to see the crossing mechanisms firsthand, and she offered to arrange for such a visit.

Consul General Ferrer commented that a major earthquake near the border would cause substantial damage to border crossing infrastructure and port infrastructure, as well as irrigation infrastructure, impacting the agricultural and livestock industry. She said cross-border trade would also be affected, and operations of binational companies would be disrupted. She advocated that the U.S. and Mexico continue to collaborate closely and effectively in disaster response and management.

Consul General Ferrer indicated that the Ensenada Center for Scientific Research and Higher Education already has projects with U.S. counterparts on the federal and state level. She noted that one example of this collaboration is the 17 seismological stations implemented in the northern part of Baja California under an agreement with the United States Geological Survey (USGS). In addition, she said, after the 2010 earthquake, there has been an exchange of real-time data between Mexico's national seismological service and the Southern California network in the U.S. Consul General Ferrer added that on an international level, Mexico is part of the intergovernmental coordination group for the Pacific tsunami warning system, and Mexico transmits sea level data to the Pacific Tsunami Warning Center.

Consul General Ferrer observed that there are many areas with great potential for California and Mexico to work in partnership to improve earthquake response. She recommended strengthening the collaboration between the Mexican National Center for Disaster Prevention and California institutions in order to establish protocols for the exchange of expedited seismic information, particularly in the border region. She advocated increasing coordination with the Ensenada Center for Scientific Research and Higher Education regarding the tsunami warning system.

Consul General Ferrer acknowledged that these are very challenging times, but based on the historical close collaboration between California and Mexico, she expressed her belief that there are opportunities for further collaboration. She recommended taking a visionary and creative approach to this partnership. She said Mexico has developed a triangular collaboration with some European countries on various subjects, and Mexico and California can expand their partnership to include other countries and areas of the world to improve earthquake monitoring and information. She noted that this effort would send a positive message of collaboration and goodwill to the rest of the world.

Comments or Questions from the Commissioners

Chairman Gardner remarked that Mexico is ahead of the United States in earthquake early warning, so California can learn valuable lessons from Mexico's experience. He noted that one concern is the possibility of false warnings, as demonstrated in the recent fire evacuation warning that was disseminated to Nevada and Hawaii, although it only affected a small community between

Los Angeles and Palm Springs. He added that this glitch caused many unaffected people to become worried and distressed. Chairman Gardner expressed interest in learning more about how Mexico has dealt with this issue.

Chairman Gardner noted that Consul General Ferrer mentioned the impact of earthquakes on irrigation systems. He said that after the 2010 earthquake, he was surprised to learn about the considerable amount of post-earthquake settling that resulted in repeated repairs to keep water flowing, an unanticipated problem in the Imperial Valley and the southern part of the California aqueduct.

Comments or Questions from the Public
Not comments or questions from the Commissioners

IV. UNIFORM CALIFORNIA EARTHQUAKE RUPTURE FORECAST UPDATE

Dr. Edward Field, U.S. Geological Survey gave the latest update to the Uniform California Earthquake Rupture Forecast (UCERF).

He said the most recent update, UCERF 3, is a collaborative effort between the USGS, Southern California Earthquake Center, and the California Geological Survey, with significant funding provided by the California Earthquake Authority. He stated that the Working Group on California Earthquake Probabilities develops periodic time-dependent earthquake forecasts for California, with each model attempting to create a better and more useful approximation of how earthquakes are produced.

Dr. Field noted that UCERF 3 addresses two major issues that were not part of previous models: multi-fault ruptures and spatial-temporal clustering of large earthquakes. He said UCERF 2 divided California's faults into discrete segments, but it tended to over-predict the rate of moderate-size earthquakes.

Dr. Field stated that UCERF 3 has three major components: the grand inversion, physics-based simulators, and an ETAS model. He said details of UCERF 3 are articulated in three reports issued in 2014, 2015, and last June, and a synopsis of these three papers was published on July 12 in *Seismological Research Letters*.

Dr. Field explained that UCERF 3 is based on a time-independent model that describes the long-term rate of every possible earthquake throughout the region, including multi-fault earthquakes. He noted that in recent years, seismologists have realized that California's faults are interconnected rather than separate from each other. He said this factor was incorporated in UCERF 3 through the grand inversion, or subdividing of faults into smaller pieces. He stated that the result was 250,000 different ruptures, as compared to only 8,000 in the previous model. He displayed a slide showing how a rupture can spread from one fault to another. Dr. Field indicated that once the ruptures were identified, USGS scientists investigated their magnitude and how often they can

occur.

Dr. Field advised that UCERF 3 has a lower rate of moderate magnitude 6.7 earthquakes than UCERF 2, down about 23 percent, but the rate of larger magnitude earthquakes went up by 37 percent when multi-fault ruptures are considered. He described the long-term, time-dependent model, the UCERF TD, which embodies elastic rebound theory, the idea that faults do not rupture until stresses have built up over decades or centuries to a breaking point; after a rupture, stress is relaxed, and the cycle repeats. He noted that once there has been a rupture, the probability of another rupture goes down. Mr. Field stated that some of the new physics-based simulations and more sophisticated modeling approaches have produced models that better capture this seismic behavior. He observed that the new models are more consistent, less biased, and can be applied to all faults, an important development.

Dr. Field presented a map and pointed out that faults with recent earthquakes have low probabilities of occurrence, while certain faults that are "overdue" have elevated probabilities. He noted that earthquakes are about twice as likely on faults considered "overdue."

Dr. Field said the final component of the UCERF 3 is spatial-temporal clustering, recognizing that earthquakes can sometimes come in groups. He cited the Joshua Tree, Landers, Hector Mine, and Big Bear sequences as examples of clusters of earthquakes. He stated that the same clustering effect has been seen in Italy and New Zealand.

Dr. Field said UCERF's ultimate goal is operational earthquake forecasting, a model that can provide real-time information on how probabilities are changing, a system that can be used to inform risk mitigation efforts. He noted that USGS has released information about the possibility of aftershocks for many years, but one challenge has been that nothing outside California has been automated. He advised that California's system provides basic information like how many aftershocks can be expected at a given magnitude, but it currently does not have data on proximity to population zones and projections of likely losses from aftershocks. He said UCERF currently has four viable candidate operational earthquake forecasting models, all of which assume that rate changes of little earthquakes relate to probability changes of big earthquakes. Mr. Field presented slides showing projections based on these new models.

Dr. Field noted that previous models ignore faults, and they assume that the location for a triggered earthquake is the exact same location as a past one, not taking elastic rebound and fault proximity into consideration. He stated that the California Earthquake Prediction Evaluation Council, which advises Cal OES on earthquake risk, is alerted when magnitude-5 earthquakes occur near Bombay Beach, at the southern part of the San Andreas Fault. Mr. Field said UCERF 3 includes fault-based information, addressing both proximity and frequency, when considering triggered earthquakes.

Dr. Field said UCERF 3 adds an epidemic-type aftershock sequence (ETAS) model to take into account how one earthquake can trigger its own aftershocks, which, in turn, can trigger their own aftershocks and further aftershocks. He observed that the Landers earthquake was followed several years later by the Hector Mine earthquake several kilometers away; he clarified that the Landers earthquake did not directly trigger Hector Mine, rather, it was other small earthquakes in

between.

Dr. Field described one UCERF 3 product a synthetic catalog of a earthquakes for any time period. He acknowledged that there are still some processes going on in the earth that physicists do not understand, but the ETAS model can serve as a proxy for that physics. He stated that the model is producing realistic-looking aftershock sequences and is predicting clusters of damaging earthquakes.

Dr. Field compared the projections from the previous no-fault model with the UCERF 3 model for the Haywired scenario, the next agenda item. He pointed out that UCERF 3 provides a more refined estimate of where damage is likely to occur.

Mr. Field noted that UCERF 3 provides a scientifically plausible, operational forecasting model that includes relaxed segmentation, multi-fault ruptures, elastic rebound, spatial-temporal clustering, and generates a synthetic catalog of past events for risk and loss modeling. He commented that USGS plans to develop pager and shakecast products to provide information on losses for an event that just occurred, as well as projections of possible future losses due to triggered events.

Dr. Field said UCERF 3/ETAS is now a possible basis for an operational earthquake forecast, but deploying such a system will take considerable time, resources, and effort, so USGS needs to decide whether to pursue this project. He noted that all models have uncertainties and assumptions, and the question now is whether UCERF 3/ETAS is right enough to be useful, and useful enough to be worth operationalizing. He advised that USGS is meeting now with various user groups in an effort quantify the value of this model.

Dr. Field stated that the rapid temporal decay of heightened probabilities is a challenging factor to depict in models. He displayed a full loss calculation for every type of structure, and every earthquake rupture in UCERF 3, in every census tract in the state. He noted that this kind of information can be useful to insurance companies to estimate likely losses. Dr. Field pointed out that following the HayWired scenario earthquake, the probability of another damaging earthquake jumps by a factor of seven for a year, up to a 14 percent chance of exceeding $50 billion in losses.

Dr. Field noted that USGS now faces a decision about implementing UCERF 3 and how to gauge its usefulness. He advised that because there are no identified sources of funding, building in a new operational forecasting capability will require partnering with stakeholders who are willing to commit resources. Otherwise, he observed, USGS will continue issuing its typical simple aftershock statements letting affected communities know how many earthquakes of a certain magnitude to expect.

Dr. Field indicated that USGS and the user community will need some time to identify improvements to be incorporated in a UCERF 4 model. He remarked that UCERF 3 is a big breakthrough in terms of incorporating some important new elements. However, he noted, every model can be improved and refined, so USGS should pursue development of UCERF 4. Dr. Field displayed a list of issues USGS has already identified with UCERF 3. He said USGS will hold some community workshops over the next six months to gather feedback from the user community

on the aspects of the model they would like to see improved.

Dr. Field advised that all past models have been statistics-based, but physics-based models are now being developed to help solve some of the unresolved problems. He remarked that there are still huge challenges involving the deployment of the OEF and the development of physics-based simulators. He stated that USGS needs to partner with other organizations to move forward in these areas.

Dr. Field commented that GEM published a report recently about the loss modeling sensitivity of the UCERF 3 model, and he said UCERF published similar studies earlier. He noted that this research could have provided opportunities for collaboration, and he asked how organizations can find out about projects and proposals the Commission might fund.

Comments or Questions from the Commissioners

Commissioner Miyamoto asked if the UCERF 3 projection changes the seismic hazard maps used in California. Dr. Field replied that UCERF 3 affects long-term earthquake rates, including multi-fault ruptures, which is included in the 2014 national seismic hazard map issued by USGS. He said the long-term, time-dependent model's elastic rebound component will influence the next rate filing by the California Earthquake Authority. Dr. Field observed that more extensive data on faults near San Diego were included in UCERF 3, so rates will probably increase there.

Commissioner Miyamoto observed that UCERF 3 model is based on simulations rather than real-world data, and Dr. Field confirmed that understanding. He explained that loss and hazard statistics are inferred from a set of simulations, and a good number of simulations must be run to provide an adequate sample. He estimated that USGS typically runs about 200 simulations for each event to arrive at an average. Commissioner Miyamoto cautioned that a real-world outcome could be completely different from any of the simulations. Dr. Field noted that the simulations are intended to provide a range of outcomes of what can be expected, but there are always some uncertainties.

Chairman Gardner thanked Dr. Field for his presentation. He said Dr. McCarthy would contact Dr. Field after the meeting to provide a list of research projects and explain the proposal process.

Comments or Questions from the Public
No comments or questions from the public

V. HAYWIRED SCENARIO UPDATE

Dale Cox, USGS, project manager of USGS' Science Application for Risk Reduction (SAFRR), explained that SAFRR's goal is apply science to reduce risks from natural hazards, and one of its contributions has been the creation of disaster scenarios for use in exercises by emergency responders and disaster managers, such as the scenarios used in statewide ShakeOut drills, Golden

Guardian exercises, and other events. He said SAFRR produces earthquake scenarios that include projections of the rupture itself, likely damage, secondary hazards, engineering and environmental impacts, and the resulting socioeconomic impacts. Mr. Cox noted that SAFRR has also created scenarios for large storms and tsunamis.

Mr. Cox stated that the HayWired scenario provides an opportunity for innovative research on what will happen to the wired and wireless world with a large earthquake. He observed that the Hayward Fault is probably the most dangerous fault, and certainly the most urbanized, in California. He said USGS will publish the HayWired scenario in three volumes: the first volume dealing with geophysics, which has already been completed; the second focusing on engineering and environmental impacts, currently underway; and a third on social and economic aspects. Mr. Cox described the issues addressed in each volume.

Mr. Cox stated that the HayWired scenario will take place on April 18, 2018, at 4:18 p.m. He said 62 Bay Area partners attended a kickoff meeting on April 24, 2017, and a series of workshops and exercises will be held before next April. He noted that USGS is created a partner package to give to businesses and lifeline continuity operators to provide guidance on what to do in a disaster. He added that USGS is working with the Business, Consumer Services, and Housing Agency to help with the distribution and branding of that product. Lynn Von Koch-Liebert, Deputy Secretary, California Business, Consumer Services, and Housing Agency, addressed the Commission.

Deputy Secretary Von Koch-Liebert spoke about the public engagement component of the HayWired exercise that Secretary Podesta has asked the Commission to undertake. She explained that when the Agency was first briefed on the Haywired scenario, it recognized an opportunity to engage with the business community and demonstrate some of the state's preparedness activities. She said the economic and business continuity research piece of the Haywired scenario offers a unique opportunity to add to the body of knowledge about earthquake resiliency.

Deputy Secretary Von Koch-Liebert noted that the results of the HayWired scenario modeling and research will be helpful in supporting high-level state recommendations to assist businesses in focusing on resiliency preparation. She said the scenario can also help launch a self-certification program the Seismic Safety Commission could administer, where interested entities could earn a certificate for specific resiliency efforts and be able to promote that for their businesses.

Deputy Secretary Von Koch-Liebert commented that there is a large body of messaging around seismic preparation that the Haywired event can amplify. She said the results are likely to attract media attention and public discussion, and that would be a good time to highlight the great earthquake-oriented work that has already been done by state and federal organizations.

Deputy Secretary Von Koch-Liebert observed that in order to leverage the partnership with the 62 Bay Area businesses and government organizations, and to attract favorable media publicity, the Agency advocates a consolidated and strategic branding and promotion of the event, as well as the deliverables it produces. She said the Agency envisions a consistent imagery and verbiage in a publicity campaign to promote the event; she emphasized the importance of delivering a clear, consistent, and action-oriented recommendations. She noted the Agency envisions a toolkit its 62 partners can take and adapt to promote the event and the recommendation to their own constituents

and interest groups. Above all, she indicated, the Agency envisions creating a HayWired brand that people and businesses across the state will recognize and respond to.

Deputy Secretary Von Koch-Liebert stated that initial funding will be needed to prepare for the statewide campaign and to secure a marketing and public relations firm to design the branding and campaign. She advised that the Commission will submit a formal request for funding later, and she expressed the Agency's willingness to share more information as the public relations campaign proceeds.

Mr. Cox stated that USGS will be participating soon in a large exercise with Alameda County. He added that USGS would be interested in similar work with Contra Costa County and other Bay Area counties.

Comments or Questions from the Commissioners
No comments or questions from the Commissioners

Comments or Questions from the Public
Not comments or questions from the Commissioners

VI. OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT (OSHPD) 2016 ANNUAL REPORT

Mr. Chris Tokas, Deputy Division Chief, Office of Statewide Health Planning and Development (OSHPD), noted that the Hospital Building Safety Board (HBSB) reports yearly to the Commission on its activities, and the 2016 report was submitted to SSC and posted on the website. He reviewed the background, history, and purpose of OSHPD. He noted that OSHPD is responsible for enforcing California's seismic safety requirements on hospitals.

Mr. Tokas said California's Hospital Seismic Safety Act was enacted in 1972 in response to hospital damage resulting from the 1971 San Fernando earthquake, and it identified hospitals as essential facilities that should be held to a higher standard of design and construction to ensure post-earthquake functionality. He stated that the 1972 law applied only to construction of new hospital buildings only, and OSHPD hoped that many pre-1972 would be replaced with new, conforming facilities. However, he noted, years later, a significant number of pre-1972 non-conforming hospital buildings with questionable earthquake performance were still in use.

Mr. Tokas advised that through the efforts of the Seismic Safety Commission, legislation was enacted to address these deficiencies, with a compliance deadline of July of 1991. He said the Northridge earthquake highlighted the substantial performance difference between post-1972 and pre-1972 hospital buildings. He added that similar performance differences were observed in the 1989 Loma Prieta earthquake, the 2005 San Simeon earthquake, and the 2010 earthquake in Baja

California.

Mr. Tokas stated that SB 1953 was enacted to address problems with existing hospital buildings and required performance ratings and deadlines for replacement or retrofit to ensure post-earthquake functionality and safe evacuation of patients and staff in the event of a disaster. He noted that the faster a hospital can recover from earthquake damage, the better the community will be able to proceed with economic and social renewal; and he emphasized the key role hospitals play in reducing recovery time.

Mr. Tokas said the first step in implementing SB 1953 entailed evaluating the seismic performance of each hospital building and ranking each building in a seismic performance category. He described the five performance category levels, ranging from SPC-1 through SPC-5. He noted the SPC-1 buildings are those that have been shown to pose significant risk of collapse, and SPC-5 buildings that meet code requirements. Mr. Tokas reviewed the seismic compliance timelines and pointed out the milestones and deadlines for meeting performance requirements. He added that some of the deadlines have been extended, and he identified the current compliance deadlines.

Mr. Tokas presented a comparison of 2008 and 2016 compliance statistics for California hospitals. He said about 220 SPC-1 buildings are left, about 8 percent, which need to meet at least SPC-2 standards by 2020. He noted that the rate of compliance has accelerated, and the SB 499 report submitted in November shows a further reduction in SPC-1 buildings.

Mr. Tokas advised that compliance statistics for every single facility and every building are available on OSHPD's Website, including the status of extensions.

Mr. Tokas commented that by 2030, all hospital buildings are required to reach SPC-5 performance levels, but attaining that level can be extremely expensive. In order to address this challenge, he said, the HBSB established a new performance rating, SPC-4D, to recognize funding and structural constraints that make complete compliance very difficult or impossible. He noted that SPC-4D buildings have essentially the same performance as SPC-4 buildings, but "D" means "damage control" and a return to functionality, but not as quickly as an SPC-5 building. Mr. Tokas observed that use of the SPC-4D ranking can help hospitals keep costs down, better understand their exposure, and formulate a plan for meeting the 2030 deadline.

Mr. Tokas reviewed highlights of the HBSB's activities during 2016. He discussed some of the topics addressed by the HBSB's standing committees. He reported that 66 hospital buildings have been instrumented since 1989, with 18 new buildings to be instrumented within the next year or two. He stated that OSHPD uses its own funds to install seismic instrumentation in two hospital buildings per year, and he reviewed the prioritized list of candidates.

Comments or Questions from the Commissioners

Commissioner Miyamoto asked whether the seismic instruments on hospital buildings collect real-time information or only post-earthquake information. Mr. Tokas said the instruments provide near-real-time information that is used for emergency response and prioritizing emergency

management tasks. He noted that OSHPD has a new program that allows remote monitoring. He indicated that OSHPD spends about $300,000 per year to maintain existing instruments and install new instruments in at least two buildings per year, and OSHPD also provides maintenance for owner-installed instruments.

Comments or Questions from the Public
Not comments or questions from the public

VII. HOMEOWNER'S GUIDE TO EARTHQUAKE SAFETY

Senior Structural Engineer Fred Turner said the Commission's *Homeowner's Guide to Earthquake Safety* is turning 25 this year, and the staff recommends creating a fifth edition of the *Guide*. He noted that the Commission is required by law to monitor the status of the *Guide* and make updates as necessary. He advised that the number of changes being proposed to the current version warrants a new update. Mr. Turner presented a list of proposed changes and welcomed suggestions from commissioners. He also drew attention to the summary of feedback received from stakeholders.

He noted that the *Guide* provides basic information about how to find typical earthquake weaknesses and how they can be fixed. He clarified that the *Guide* is not intended to teach people about earthquake hazards, safety, and emergency response, although the Commission has included some of those materials as a way of increasing general public awareness. Mr. Turner stated the *Guide* is the Commission's most popular publication.

Mr. Turner advised that one of the biggest criticisms about the *Guide* over the years has been that the actual disclosure allows sellers to simply say they don't know, allowing a sale to go through. He said a close reading of the state law indicates that provision cannot be changed. He observed that the advantage of the disclosure system is that it is market-driven, with real estate agents and sellers being motivated to disclose vulnerabilities and flaws before a sale so they can comply with the law, and buyers motivated to offer less for properties with earthquake weaknesses. Mr. Turner remarked that there are limitations on what a seller can be forced to disclose, and there are legal restrictions against requiring owners to remove wall finishes in order to conduct a thorough disclosure.

Mr. Turner said some users have complained that the *Guide* is too long, so the staff welcomes suggestions from commissioners and others as to what sections might be consolidated, condensed, or eliminated. He noted that the images in the current version of the *Guide* are in black and white, and although color images would be more effective, this publication is duplicated in large quantities at very low costs by thousands of real estate agents throughout the state. He stated that these users are still very much interested in keeping their costs low and not changing to a color version. He added that the black-and-white version is available online, and most people are downloading electronic copies.

Mr. Turner commented that managing both a black-and-white and color version of the *Guide*

would be a challenge for the Commission. He recommended that the Commission consider whether the black-and-white guide is motivational enough and worth the cost to create a color version. He said the staff at this point is leaning toward just staying with a black-and-white version. He welcomed feedback from commissioners.

Comments or Questions from the Commissioners

Commissioner *** questioned the need for hard copies. Mr. Turner said more electronic copies are being ordered online now, but there are still a few homeowners who request hard copies.

Chairman Gardner suggested that Commissioners review the draft and submit changes to the staff before the September meeting.

Commissioner Strack expressed support for an online-only version, and other commissioners agreed. Mr. Turner noted that the staff can still provide hard copies upon request. He added that although the Commission retains control over the content of the *Guide*, some users have developed apps of their own.

Commissioner *** asked whether the *Guide* was legislatively required. Mr. Turner responded that there were two laws enacted in 1991 and 1992 that dictated some of the contents of the *Guide*, and then the Commission has exercised its discretion to include other sections. He said the disclosure form on Page 47 is legislatively required, and the "don't know" and "actual knowledge" language is mandated by law, so the Commission has little discretion to change the disclosure form itself. He advised that the Commission is the author of the *Guide*, and the Commission is legislatively required to update the *Guide*. Mr. Turner pointed out that individual commissioners are identified as authors on the second page.

Commissioner Silva said that from a layperson's perspective, she found some of the language in the *Guide* difficult to understand, and she questioned whether the *Guide* was actually achieving its objectives of being helpful to homeowners. She added that her background was in the field of communications, and she volunteered to participate on a subcommittee to review the level of content required to deliver the message, as well as the best channels for distribution.

Mr. Turner commented that the over the years, the *Guide* was revised to eliminate the word "cripple" because of its pejorative connotation, but that wording still appears in the Building Code. He proposed reducing the use of the word and including a better explanation.

Mr. Turner said the Commission has received feedback from users in the past about the *Guide*'s usability. He recognized the tension between including provisions that might require a homeowner to hire a professional architect or engineer versus saying nothing at all, and he acknowledged that the *Guide* has tended to err on the side of mentioning certain terms that may not be readily understandable by a homeowner, but still potentially relevant.

Mr. McCarthy said the staff is planning to meet with representatives from the Association of Realtors to solicit their input.

Chairman Gardner thanked Mr. Turner for his report and encouraged commissioners to submit their comments as soon as possible.

Comments or Questions from the Public

No comments or questions from the public

VIII. GLOBAL EARTHQUAKE MODEL (GEM): AMENDMENT OF "BACK TO NORMAL"

Senior Engineering Geologist Robert Anderson presented a final report from the Global Earthquake Model (GEM) on the Commission-sponsored "Back to Normal" earthquake recovery modeling project. He said the GEM product is different from most computer models because it focuses on the recovery end, rather than on assessing hazards and estimating losses. He noted that the goal of the GEM project was to create a functional model to provide a snapshot of the recovery process during a given window of time.

Mr. Anderson recalled that the Commission received a status report on this project and a sister project at its May meeting, and had approved the sister project, but this project was not approved pending responses to questions raised by Commissioner Kit Miyamoto that needed to be addressed in the Executive Summary and the body of the report. He advised that GEM has addressed those comments and concerns, and the revised language was reviewed and approved by Commissioner Miyamoto. He drew attention to Attachment 1 for a summary of the revisions to the version presented in May.

Mr. Anderson recommended that the Commission approve the report as amended. Mr. McCarthy said the staff will be meeting soon with Department of Insurance representatives to develop an implementation plan.

Comments or Questions from the Commissioners

No comments or questions from Commissioners

Comments or Questions from Public

No comments or questions from public

MOTION: Commissioner Miyamoto made a motion, seconded by Commissioner Strack, that:

> *The Commission approve GEM's "Back to Normal" recovery modeling report as amended.*

* Motion carried, 13 - 0 – 1 (Commissioner Wong abstaining).

IX. INTERACTIVE WEB-BASED EARTHQUAKE AND TSUNAMI EDUCATION

PROGRAM

Mr. Anderson provided an update on the Commission's Web-based earthquake and tsunami education project with Dr. Lori Dengler, Humboldt State University. He noted the 25th anniversary of the Mendocino earthquakes occurred late April, and there were a number of events and activities in the Mendocino and Humboldt Bay area commemorating the earthquakes and the damage they caused. He said Dr. Dengler was interviewed by Humboldt's *Times Standard* newspaper, and she also writes a weekly column on earthquake and tsunami issues.

Mr. Anderson indicated that the report identifies each generation of the book, *The Extraordinary Voyage of Kamome, A Tsunami Boat that Came Home*, and its reformatted electronic version. He observed that the book is highly popular, having already gone through three printings, and is being used in different school districts in Mendocino and Humboldt Counties. He said a Spanish version is now available, with German, French, Russian, and possibly Swedish versions planned for release later in the year.

Mr. Anderson noted that the Commission has provided funds for this project, supplemented by in-kind matches, and the project will end next February.

Comments or questions from the Commissioners
Chairman Gardner said the *Kamome* is a boat that was washed out to sea after the tsunami that eventually washed up on a beach in Northern California, and then a group of local school children raised funds and sent the boat back to Japan. He remarked that online versions are available, and he encouraged commissioners to read the book. Mr. Anderson added that the book is also available through Humboldt University Press.

Comments or questions from the Public
No comments or questions from public

X. LEGISLATIVE REPORT

Earthquake Early Warning System Advisory Board

Commissioner Arba stated that Cal OES hosted its inaugural California Earthquake Early Warning System Advisory Board on June 22 at the State Capitol in Sacramento. He said Cal OES provided the members with an update on current efforts to develop the system and the objectives going forward. He indicated that the board consists of representatives from four state agency secretaries, a member appointed by the governor, one representing the utilities industry, and a county government representative

Commissioner Arba said the next meeting will focus on the system build-out and seismic networking plans, development of the business plan, and estimating the overall costs of the system.

Legislative Update

Ms. Valencia, SSC Legislative/ Communications Director reported that the Legislature was towards the end of session, and all bills assigned to fiscal and appropriations committees have a deadline of July 14th to be out of committee. She said the recess is scheduled to begin on July 21, provided a budget bill has been enacted. She stated the Governor's Office has assigned no bills to the Commission to analyze.
Ms. Valencia informed the Commission that Senator Jackson, who represents the Senate 14th District in Santa Barbara and Ventura Counties, has partnered with Cal OES to hold a series of informational hearings regarding earthquakes. She said the first hearing was scheduled for Thursday, July 20, at the State Capitol, and will focus on megaquakes, including the geological risk and predicted impacts of a large earthquake, and another hearing on recovery and response is planned for August. She advised that the Commission will participate in the second informational hearing.

Ms. Valencia said there was bipartisan support in Congress for maintaining funding for a West Coast earthquake early warning system, and the $10.2 million in funding was approved by the House of Representatives, and it now needs to be approved by the Senate and signed into law by the president. She reported that Congressional funding for earthquake early warning in 2015 was $5 million, $8.2 million in 2016, $10.2 million in 2017, and $10.2 million is being proposed for 2018 as well.

Ms. Valencia noted that the House Appropriations Subcommittee penciled in $1 billion for the USGS, $46 million below last year's budget, but the Trump Administration has called for $137.8 million cut.

Commission Website
Ms. Valencia reported that she and Ms. Daniel are continuing the work on the redesign of the Commission's website so that it may reflect the latest state-template. The goal is to have the website completed by the end of the year.

Meeting Minutes
Ms. Daniel said minutes of the May meeting would be presented to the Commission for approval at the September meeting.

Comments or Questions from the Commissioners
No comments or questions from Commissioners

Comments or Questions from Public
No comments or questions from public

XI. EXECUTIVE DIRECTOR'S REPORT

Project to Survey Japanese Companies on Earthquake Recovery Lessons
Mr. McCarthy noted that he had discussed this project earlier in the meeting.

Update on Commission's Statewide Insurance Task Force Concept

Mr. McCarthy said the Commission's report on the Napa earthquake identified the lack earthquake insurance as a major impediment to speedy recovery, and it included a recommendation that the Commission establish a task force to look at the issue and identify ways to increase participation in earthquake insurance. He noted the task force will be holding a one-day workshop in Sacramento on August 31, and he offered to send commissioners the agenda as soon as it becomes available.

Administrative Reporting

Ms. Daniel drew attention to the budget report in the meeting packet. She said the Commission is working with the Department of General Services accounting staff to close the books for fiscal year 2016-17. She advised that Department of General Services is projecting a year-end surplus of $19,900, but the staff believes that amount is actually about $40,000. She added that the Commission wants to hold some funds in reserve against items that may come in over the next few years.

Ms. Daniel reminded Commissioners that the September Commission meeting will take place in Riverside on September 13 and 14.

Ms. Daniel stated that the staff will start sending Outlook invitations for all future meeting dates so they can be included on Commissioners' calendars. She reviewed the proposed 2018 meeting schedule. She advised that 2018 meetings are scheduled for January 11, at the State Capitol, but the March meeting will be skipped and the Commission will meet instead on April 18 and 19 in Oakland for the HayWired Scenario.

Mr. McCarthy noted that the Commission can hold a teleconference meeting in March, and Commissioners expressed support for that addition to the calendar.

Ms. Daniel said the Commission will meet again in June, and a two-day event will be held on September 12 and 13, 2018. She welcomed suggestions for field trips and locations for the Commission's 2018 September meeting.

Comments or Questions from the Commissioners

Commissioner Parkinson suggested touring the Diablo Canyon power plant and meeting in that area.

Commissioner Valenzuela said he liked the idea of meeting in San Diego as a follow-up to the presentation from the Mexican Consul. He noted the San Diego Chapter of the Earthquake Engineering Research Institute is in the process of updating the earthquake scenario for San Diego and Tijuana, and a meeting in that area will help increase awareness of the risks in that region.

Mr. McCarthy recalled that the Commission had talked previously about holding a joint meeting with the Nevada Seismic Safety Committee in the North Lake Tahoe area.

Commissioner Strack pointed out that the Commission has never met in the northern part of the

state, such as Redding, Shasta, and Lassen.

Ms. Daniel said she would create a calendar for commissioners to approve at the next meeting. She reviewed the locations mentioned so far: Diablo Canyon, San Diego, Tahoe Basin, and the Redding/Lassen area.

Mr. McCarthy noted that it might be helpful to devote some time at the September meeting in Riverside for a two-hour workshop to discuss Commissioners' issues, priorities, and goals. He observed this kind of feedback provides helpful guidance to the staff.

Vice Chair Johnson expressed support for the idea of an orientation workshop in addition to a field trip. She recommended briefing Commissioners on some of the Commission's past achievements and work products to give them a better understanding of the Commission's activities.

Chairman Gardner stated that the Commission will probably be staying at the Mission Inn, a historic hotel in Riverside, that provides an interesting example of various construction methods and seismic reinforcement. He said the hotel was heavily reinforced as part of a remodeling project twenty years ago. He noted that Riverside also has a new three-story administration building with visible earthquake bracing, and there are other city-owned buildings within walking distance that present opportunities to look at retrofit performance and new construction.

Ms. Daniel said the last meeting in 2017 is scheduled for November 9. She noted the Commission typically meets away from Sacramento in May and September each year. Chairman Gardner added that the Commission likes to alternate between north and south locations.

Ms. Daniel urged Commissioners to submit any outstanding travel claims for 2016-17. She noted an email to new Commissioners has been sent explaining the travel expense and reimbursement procedures.

Comments or Questions from Public
No comments or questions from public

XII. PUBLIC COMMENT

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

XIII. MISCELLANEOUS & GOOD OF THE MEETING

Mr. Anderson asked if the Commission had approved the 2016 annual report. Ms. Valencia explained that the Commission needs to obtain permission to use some of the copyrighted graphics. She clarified that the Commission approved the text of the report without the graphics.

Ms. Daniel said the Annual Report was distributed two meetings before, and Commissioners were asked to submit comments and revisions. She reported that only one Commissioner made comments. She noted that the staff will email copies with graphics to Commissioners before the September meeting.

XI. ADJOURN

There being no further business, Chairman Gardner thanked everyone for attending, and the meeting was adjourned at 1:10 p.m.