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**State of California  
Alfred E. Alquist  
Seismic Safety Commission**



**Annual Report for 2008**  
*(Commission approved January 8, 2009)*



**California Seismic Safety Commission**  
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CSSC 2009-01

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*Senator Alfred E. Alquist  
Seismic Safety Commission  
Founder*



State Senator Al Alquist was born on August 2, 1908 in Memphis, Tennessee. Senator Alquist was elected to the State Assembly in 1962, and four years later, the State Senate, where he served for 30 years.

*The Commission will not let his legacy be in vain, but will continue supporting his efforts. He laid a strong foundation and his courage and leadership will be profoundly missed by all whose lives he touched.*

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**2008 Annual Report**  
**Seismic Safety Commission**

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**Executive Summary**

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The Seismic Safety Commission (Commission) has been dedicated to reducing earthquake risk and speeding recovery for the people of California since 1975. The Commission investigates earthquakes, reports on earthquake-related issues, and evaluates and recommends to the Governor and Legislature policies needed to reduce earthquake risk and to ensure a coordinated framework for establishing earthquake safety policies and programs in California.

The Commission has provided leadership and support in reducing losses and speeding recovery when earthquakes strike California. California must continue to make significant progress toward earthquake safety. Mitigation programs implemented in California, other states and in many nations has reduced the losses from earthquakes.

The Commission's actions in 2008 continued to reduce hazards and improve post-earthquake recovery capabilities in California. Some examples of the Commission's accomplishments include:

- The California Earthquake Research Program is in its second year. This program has produced cost effective products through partnerships and leveraged non-general funds from various private and public sources.
- The Commission reviewed and commented on the hazards to and vulnerabilities of California's two operating nuclear power plants.
- The Commission reviewed and commented on changes that could impact public health and safety within the San Francisco Public Utilities Commission's Water System Improvement Program.
- The Commission made significant progress within six categories of the State's Seismic Mitigation Plan.

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## Mission Statement

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To provide decision makers and the general public with cost-effective recommendations to reduce earthquake losses and expedite recovery from damaging earthquakes.

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## Vision Statement

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To provide leadership in implementing and achieving the goals and objectives in the *California Earthquake Loss Reduction Plan*, including, to advance learning about earthquakes and risk reduction in both the short and long term, advance the earthquake resistant designs of buildings and other important structures, and advance the preparedness and emergency response systems to earthquakes.

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## Commission Membership

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| Honorable Mark Church <i>Chair</i><br><i>San Mateo County Supervisor</i>   | <i>Local Government</i>  |
| Honorable Ken Cooley, Vice Chair<br><i>Rancho Cordova City Councilman</i>  | <i>City Government</i>   |
| Andrew A. Adelman, PE<br>Senator Elaine Alquist<br>James Schwab, <i>Representative</i>   | <i>Cities/Building Official</i><br><i>State Senate</i>   |
| Arul Arulmoli, Ph.D., PE, GE<br>Assemblyman Sam Blakeslee<br>Jonathan Changus, <i>Representative</i>   | <i>Geotechnical Engineering</i><br><i>State Assembly</i>   |
| William Chubb<br>Honorable Brad Mitzelfelt<br><i>San Bernardino County Supervisor</i>  | <i>Public Utilities</i><br><i>County Government</i>  |
| Lucile M. Jones, Ph.D.<br>Sharron Leao ( <i>State Appointment</i> )<br>John L. Littrell, PE<br>Elizabeth Mathieson, CEG<br>Dennis S. Mileti, Ph.D.<br>Gary McGavin, AIA<br>Donald Parker<br>Henry Renteria ( <i>State Appointment</i> )<br>Ali Sadre M.S.C.E., S.E.<br>Michael Stevens<br>David Thorman, AIA( <i>State Appointment</i> )<br>David Walls ( <i>State Appointment</i> ) | <i>Seismology</i><br><i>Emergency Services</i><br><i>Mechanical Engineering</i><br><i>Geology</i><br><i>Social Services</i><br><i>Architectural Planning</i><br><i>Fire Protection</i><br><i>Office of Emergency Services</i><br><i>Structural Engineering</i><br><i>Insurance</i><br><i>State Architect (State Appointment)</i><br><i>Building Standards Commission</i> |

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## Commission Staff

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Richard J. McCarthy, *Executive Director*  
Robert Anderson, *Senior Engineering Geologist*  
Sue Celli, *Executive Secretary and Office Manager*  
Karen Cogan, *Administrative Manager, Annual Report Editor*  
Henry Reyes, *Structural Engineer (Special Projects)*  
Fred Turner, *Senior Structural Engineer*  
Meghan Sweeney, *Student Assistant*

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## Commission Authority

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The California Seismic Safety Commission was established in 1975 to advise the Governor, Legislature, state and local agencies, and the public about strategies to reduce earthquake risk (Government Code §8870, et seq.). The Commission reports through the State and Consumer Services Agency and consists of 20 commissioners chosen for their technical expertise and experience. The Governor appoints 15 commissioners, the Senate and the Assembly each choose a representative from their respective memberships (2), and three (3) state organizations are represented (*Governor's Office of Emergency Services, California Building Standards Commission, and the Office of the State Architect*).

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## Elected Officers

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In 2008, the Commission elected Mark Church as Chairman and Kenneth Cooley as Vice Chairman. Their terms are approximately one year.

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## Commission Funding

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Chapter 49, Statutes of 2006 (AB 1809, Committee on Budget), was language in a budget trailer bill that extended the sunset date on the Insurance Fund that supports the Commission, from July 1, 2007 until July 1, 2009. The Commission's operational budget for fiscal year (FY) 2008-09 is \$1.3 million with an additional \$2.0 million in monies to be used exclusively for the Earthquake Research and Projects Program (Program). The Administration's current proposal to fund the Commission is to continue Insurance Fund support through June 30, 2012.

## Progress on State Seismic Mitigation Plan

The California Earthquake Loss Reduction Plan (Plan) 2007-2011 was released in January 2007. This Plan continues to identify current and proposed seismic safety efforts, goals, and priorities for the State through 2011. The Plan satisfies three needs:

- Reduces earthquake loss.
- Advises the executive branch on overall priorities and implementation strategies
- Supports the State's requirement to update the Governor's Office of Emergency Services Statewide Multi-Hazard Mitigation Plan.

The Plan is a living document that continues to evolve. Here is a summary of progress made in 2008:

| Element                                    | Plan Initiative                 | Brief Project Description  |
|--|---------------------------------|--|
| Geosciences                                | 1.4.                            | A research project to reassess the tsunami threat potential from a Cascadia Subduction zone earthquake that causes high ocean current velocities inside the Ports of Los Angeles and Long Beach.   |
| Research & Technology<br><br>New Buildings | 2.1<br>2.2<br>7.2<br>7.3        | For tall buildings, development of consensus performance objectives, ground motion selection and scaling procedures, modeling procedures, acceptance criteria, and, ultimately, guidelines suitable for seismic design of tall buildings for adoption by building codes and local jurisdictions  |
| Existing Buildings<br>Preparedness         | 6.4.1<br>9.4                    | Comparative research conducted by San Jose State University, to evaluate the differences, if any, in the earthquake performance of public school buildings constructed to Field Act standards and buildings constructed to Uniform Building Code Standards.  |
| Education & Information<br>Preparedness    | 3.2<br>9.1<br>9.3               | A research project to determine the current state of household earthquake mitigation and preparedness for the state for selected racial and ethnic minorities, and different geographical areas at high risk. The Commission partnered with California Emergency Services and Homeland Security, and California Volunteers and contributed \$350,000.  |
| Education & Information<br>Preparedness    | 3.1<br>3.2<br>9.1<br>9.2<br>9.3 | A multi-faceted project designed around a new Southern California earthquake scenario and public earthquake drill, that created new methods for research and communication about earthquake preparedness. Three main projects: (1) Visual Sourcebook (2) Get Ready Public Awareness Campaign (3) The Los Angeles Earthquake: Get Ready Civic Spectacle |
| Education & Information<br>Preparedness    | 3.1<br>3.2<br>9.1<br>9.2        | A state-wide education effort that increased earthquake awareness and readiness among the public and emergency planners and responders called the Northern & Southern California Great Shakeouts. The Commission participated as a sponsor and contributed   |

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|  | 9.3 | \$250,000 towards the effort. |
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**Commission Comments to Joint Legislative Audit Committee regarding  
San Francisco Public Utility Commission’s  
Water System Improvement Plan**

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The San Francisco Public Utilities Commission (SFPUC) initiated \$4.3 billion program to install a new dam and pipelines, repair existing pipelines and facilities and construct new earthquake fault crossings after it determined the Hetch Hetchy Water System was vulnerable to earthquakes. By enabling legislation, the SFPUC is required to make annual reports and provide notice to the Seismic Safety Commission of any changes resulting in delays, additions, or deletions in the work or scheduling of the SFPUC’s Water System Improvement Program. On April 1, 2008 the SFPUC notified the Commission of changes to its Program. The Commission was required to comment on the significance of the changes with respect to public health and safety and report to the Joint Legislative Audit Committee.

After a detailed review of the changes to the Water System Improvement Program, the Commission determined that the scheduling delays proposed for some of the major seismic projects increase the incremental seismic risk to the system and expressed concern about changes in project scope. The Commission also identified certain complex technical issues that need additional review that are beyond the expertise of the Seismic Safety Commission. Other Commission concerns included the need for independent review and oversight consistent with the Commission’s Policy on Independent Review of Critical Facilities:

“Independent review is the autonomous and objective review of a proposed project by qualified individuals who hold no personal interest or claim in that project, and who are in no way beholden to those proposing or opposing the project. Such reviewers should be experts in their respective fields, able to make professional judgments without personal prejudice, and willing to assume professional accountability in their function.” (SSC 81-01)

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**Commission Comments On Two Nuclear Power Plants**

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The Commission formed a Subcommittee during 2008 that was charged with providing the California Energy Commission (CEC) comments on the October 10, 2008 draft report titled “*Assessment of California’s Nuclear Power Plants: AB1632 Committee Report*” (Report). Commissioners and staff reviewed multiple drafts of the Energy Commission’s



report and provided written comments. In addition, Commission staff testified before an Energy Commission subcommittee.

Assembly Bill 1632 (Blakeslee) directed the California Energy Commission to assess the potential vulnerability of California's largest base load power plants, which are California's two operating commercial nuclear power plants, to a major disruption due to seismic event or plant aging. The state's two operating commercial nuclear power plants are Pacific Gas & Electric's (PG&E) Diablo Canyon Power Plant (Diablo Canyon) and Southern California Edison's (SCE) San Onofre Nuclear Generating Station (SONGS).

Senior technical staff from the California Geological Survey as well as the Seismic Safety Commission and the Coastal Commission, participated on the Seismic Vulnerability Advisory Team and comments were approved and submitted to the Energy Commission in October 2008.

The Commission's main recommendations were 1) The CEC revise its report describing how nuclear plants' vulnerability to earthquakes relates to the vulnerability of the state-wide electrical system, and describe the reliability gaps that are likely to exist; 2) The CEC should fund an earthquake reliability study of the statewide energy infrastructure that identifies its vulnerability; and 3) The CEC establish reliability goals in future Integrated Energy Policy Reports.

A copy of the final report by the Energy Commission may be found at their website <http://www.energy.ca.gov> and clicking on *Assessment of California's Nuclear Power Plants: AB1632 Committee Report*

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## **California Earthquake Authority's Multi-disciplinary Research Team**

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The Commission entered into an agreement for consulting services as a member of the California Earthquake Authority's Multidisciplinary Research Team (CEA MRT). The CEA MRT is made up of representatives from the CEA, the Seismic Safety Commission and the California Geological Survey. The Commission assigned a Senior Geologist to fulfill the agreement (- ¾ time). Through the agreement, the USGS National Seismic Hazard Map was updated and earthquake forecast methodology changed in order to assist more efficiently with CEA loss models. These changes were approved by the National Earthquake Prediction Evaluation Council and the California Earthquake Prediction Evaluation Council.

A second project was the development of a simulation platform for modeling strong earthquake shaking between strong motion sensors. The simulation will allow more realistic models of strong ground motion. The work done under CEA MRT was an effort to use the best available science when considering seismic hazards by the CEA and its loss modelers.

These two projects will assist CEA in setting rates for policyholders. The CEA MRT is continuing to work on Uniform California Earthquake Rupture Forecast (UCERF) related issues.

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### **Federal Emergency Management Agency Grant Repayment**

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The Commission received a grant from the Federal Emergency Management Agency (FEMA) in 1994 to produce a report on the Northridge earthquake. The total grant amount OF \$1.1 million was approved by OES and FEMA. Beginning in 2001, FEMA audited the Commission and requested that \$188,000 be returned to FEMA because of a discrepancy in the grant and the scope of work. After discussions with FEMA (with OES representing the Commission) it was clear the appeal process would be unsuccessful. In year 2007, the Commission granted approval to close the appeal process and return the \$188,000 to FEMA. The \$188,000 was repaid to FEMA through OES over three fiscal years. A final payment was made in September 2008.

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### **Commission Partnership with Seccion Amarilla Spanish Yellow Pages**

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The Seismic Safety Commission began partnering with Seccion Amarilla (formerly Enlacé) Spanish Yellow Pages in the spring of 2007. Seccion is the largest Spanish business directory in California. The 2009 San Francisco Seccion Amarilla Spanish Yellow Pages was released for San Francisco area. The Commission purchased 3- pages for publication for earthquake preparedness information. Seccion Amarilla placed these 3 pages at the front of the directory which will boost public awareness.

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## The Seismic Safety Commission Earthquake Research Program

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In 2007, the Commission received \$6.5 million of the California Research Assistance Fund (CRAF) settlement for seismic projects. These non-general funds are earmarked for earthquake risk reduction projects and are being administered and awarded through the *Commission's Earthquake Research Program*. Projects in 2008 included:

### **Field Act Building Performance Study**

The Commission issued a paper on the Field Act entitled: *The Future of the Field Act for Public Schools* about nine years ago and recently completed a report entitled: *The Field Act and Public School Construction: A 2007 Perspective*. The project calls for comparative research to be conducted by San Jose State University, to evaluate the differences, if any, in the earthquake performance of public school buildings constructed to Field Act standards and buildings constructed to non-Field Act standards that have been subjected to damaging earthquakes. The study focuses on earthquakes that have occurred since 1952. Commission Contribution to Project: \$350,000. The Commission provided sole funding, rather than leveraging funds, to assure that the review would be independent. The final report is to be released in Fall 2009.

Commission Contribution \$350,000

Matched Funds: No funds were leveraged due to the Commission's important need for an independent review.

### **Preparedness Survey**

This survey will determine the current state of household earthquake mitigation and preparedness for the state for selected racial and ethnic minorities within different geographical areas of the State. The survey questionnaire will also be translated into Spanish. Incentives in the amount of \$20 gift certificates to Target, Barnes and Noble, or Wal-Mart or contributions to a charity are provided to all respondents who complete the interview. Other contributing partners that provided matching funds are: OES, FEMA, and private industry. The Study's recommendations will focus on improving household preparedness and mitigation.

Commission Contribution \$350,000

Matched Funds: \$420,000

### **Tall Buildings Initiative, Pacific Earthquake Engineering Research Center.**

This project will help California's local governments address earthquake vulnerabilities of tall buildings in California. It will also help develop consensus

performance objectives, ground motion selection and scaling procedures, modeling procedures, acceptance criteria, and, ultimately, guidelines suitable for adoption by building codes and local jurisdictions.

Commission Contribution Up to \$350,000

Matched Funds: \$1,040,000

### **Distant Tsunami Threat to the Ports of Los Angeles and Long Beach**

This project examines the tsunami threat potential from a Cascadia Subduction earthquake event that may cause high current velocities inside the harbors at the Ports of Los Angeles and Long Beach.

The National Oceanic and Atmospheric Administrations (NOAA) Center for Tsunami Research developed a tsunami forecast capability for use in warning operations. The Port of Los Angeles is one of NOAA's locations where a high-resolution tsunami inundation model has been developed for real-time forecasting. The results will be useful in assessing the tsunami hazard to the Ports of Los Angeles and Long Beach from Cascadia Subduction Zone-generated tsunamis.

Commission Contribution \$50,000

Matched Funds: \$50,000

### **Los Angeles Earthquake: Get Ready**

In partnership with the Art Center College of Design, this initiative included a multi-faceted project with the goal of creating new methods for research and communication about earthquake preparedness. The "LA Get Ready" project was a comprehensive public awareness campaign for earthquake preparedness and response including a "drop, cover and hold" exercise by 5 million southern Californians, a Golden Guardian exercise 7.8 magnitude scenario earthquake, an international conference in Los Angeles, awareness activities months preceding the events, and the outdoor earthquake preparedness fair at the Los Angeles Staples Center on the last day of the event. A visual sourcebook was also created that serves as a compendium of diverse voices and various narratives from seismic leaders in their respective fields.

Partners included the US Geological Society, Southern California Earthquake Center, Federal Emergency Management Agency, US Department of Homeland Security, California Governor's Office of Emergency Services, California and Governor's Office of Homeland Security Three main projects within the Get Ready Project were:

1. The Los Angeles Earthquake: Get Ready Visual Sourcebook
2. The Los Angeles Earthquake: Get Ready Public Awareness Campaign
3. The Los Angeles Earthquake: Get Ready Civic Spectacle

Commission Contribution to Project: \$250,000. Total matching funds leveraged:  
\$1,710,000

Commission Contribution \$250,000

Matched Funds: \$1,710,000

Key Program Statistics:

1. X number of schools participated in stop drop cover exercise
2. X number of radio announcements
3. X number of web hits

| Project Name                                  | Description  | Amount             | Amount Leveraged   | Contractor                                     | Status                                    |
|---|--|--------------------|--------------------|--|---|
| Household Preparedness Survey                 | Determine through a survey the current state of household earthquake mitigation and preparedness for selected racial and ethnic minorities, and different geographical areas at high risk. Partnership with the OES, California Volunteers, Governor's Office Insurance Advisor, Office of Homeland Security, and the University of California at Los Angeles. | \$350,000          | \$420,000          | University of California, Los Angeles          | Underway<br>Due date:<br>Late Spring 2009 |
| Tall Buildings Initiative                     | Develop seismic performance objectives and alternative design acceptance criteria for future tall building construction.   | \$350,000          | \$1,040,000        | Pacific Earthquake Engineering Research Center | Underway                                  |
| Los Angeles Art Center College: Get Ready     | Partner with Art Center College of Design to develop new and creative paradigms for research and communication outreach about earthquake preparedness for: 1) Los Angeles Earthquake: Get Ready Visual Sourcebook; 2) Los Angeles Earthquake: Get Ready Public Awareness Campaign; and 3) Los Angeles Earthquake: Get Ready Civic Spectacle.                   | \$250,000          | \$1,710,000        | Los Angeles Art Center College of Design       | Completed                                 |
| Tsunami Risk to Los Angeles/Long Beach Harbor | Assess the tsunami threat potential from a Cascadia Subduction zone earthquake that causes high ocean current velocities inside the Ports of Los Angeles and Long Beach.   | \$50,000           | \$50,000           | National Oceanic and Atmospheric Admin.        | Underway<br>Due Date:<br>July 2009        |
| Performance of Field Act Buildings            | Evaluate the differences in the performance of public schools constructed to Field Act standards and schools constructed to non-Field Act standards subjected to earthquakes.  | \$350,000          | \$0                | San Jose State University                      | Underway<br>Due Date:<br>Late Spring 2009 |
| <b>TOTAL</b>                                  |  | <b>\$1,350,000</b> | <b>\$3,220,000</b> |  |   |