

Annual Report

2019 ALFRED E. ALQUIST SEISMIC SAFETY COMMISSION

Mission: Support the People of California to Reduce Life and Economic Losses from earthquake related disasters.

Alfred E. Alquist Seismic Safety Commission (SSC)

Tel (916)263-5506
Fax (916)263-0594

2945 Ramco Street
Suite 195
West Sacramento CA 95691

www.ssc.ca.gov

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Executive Summary

The following annual report provides a brief overview of the projects of the Alfred E. Alquist Seismic Safety Commission (SSC) in 2019. Once the projects are completed, any reports or studies produced are posted on the SSC “publications” webpage at <http://www.ssc.ca.gov/pub.html>

The SSC is the primary seismic safety resource for the State of California dedicated to reducing earthquake risk for the people of California since 1975. The SSC investigates earthquakes, reports on earthquake-related issues, and evaluates and recommends to the Governor and Legislature policies needed to reduce earthquake risks. Although the SSC has no regulatory authority on earthquake policy, the SSC strives to ensure a coordinated framework for establishing earthquake safety policies and programs in California.

Richard McCarthy
Executive Director

SSC Vision

Achieve resiliency by providing state, local government and the public with state-of-the-art disaster tools that will reduce losses and expedite recovery.

2019 SSC Staff

Richard J. McCarthy-----Executive Director
Robert Anderson-----Senior Engineering Geologist
Lena Daniel-----Chief Administrative Manager of Operations
Michael Orille----- Project Analyst
Fred Turner-----Senior Structural Engineer
Salina Valencia-----Director of Legislative/ Communications

2019 SSC Commissioners

Name	Area of Expertise
Michael Gardner	Local Government
Honorable Jerry Hill	California State Senate
Honorable Ken Cooley	California State Assembly
Mark Ghilarducci	California Office of Emergency Services
Mia Marvelli	California Building Standards Commission
Ida Clair	California State Architect
Randy Goodwin	Architectural & Planning Building Official
Dr. Kit Miyamoto	Structural Engineer
Dr. Jorge Meneses	Geotechnical Engineer
Ian Parkinson	Emergency Services
Honorable David Rabbitt	Local Government
Timothy Strack	Fire Protection
Andrew Tran	Insurance
Honorable Cindy Silva	Local Government
Fuad Sweiss	Mechanical Engineer
Honorable Edward Valenzuela	Local Government
Ivan Wong	Seismologist
Tracy Johnson	Public Utilities
Vacant	Social Services
Vacant	Geologist

Authority & Statute

The California Seismic Safety Commission (SSC) 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 SSC is an independent unit within the Business, Consumer Services and Housing Agency (BCSH) and offers a broad perspective of the overall seismic risk to the state, sets consistent policies and goals without regard to political agendas and makes independent findings and recommendations without agency bias or repercussions.

The SSC investigates earthquake-related issues and evaluates and recommends to the Governor and Legislature policies and programs needed to reduce earthquake risk.

To ensure a coordinated framework for establishing earthquake safety policies and programs in California, the SSC uses the expertise of its members, experienced in earthquake-related fields, to review, evaluate, and translate scientific information and make recommendations to guide and influence earthquake safety policies.

The SSC coordinates the State's mitigation efforts through publication and promotion of the California Earthquake Loss Reduction Plan, which serves as the State's strategic earthquake plan, guiding the executive and legislative branches. It acts efficiently after earthquakes to gather information and recommend policy changes to incorporate lessons learned and activities to enhance seismic safety.

The SSC does not have regulatory authority over any specific programs or agencies, but it is empowered with quasi-judicial and investigative powers to examine and conduct studies on seismic safety policies and programs across lines of governments and the private sector.

The SSC is composed of 20 Commissioners: 15 appointed by the Governor, with expertise in earthquake or disaster-related fields; 1 legislative member from each of the California State Senate and the California State Assembly; and 3 Commissioners representing the Governor's Office of Emergency Services, the Division of State Architect, and the Building Standards Commission. The SSC is supported by 6.0 staff members.

Financial Summary

The following provides background information on the SSC's various funding sources.

Insurance Fund

In 2003, the California Insurance Code (CIC) section 12975.9 established a Seismic Safety subaccount in the Insurance Fund and imposed an assessment to fund the Alfred E. Alquist Seismic Safety Commission (SSC) upon appropriation by the Legislature. On July 1, 2012, this assessment became inoperative as the SSC was funded by the General Fund in Fiscal Year (FY) 2012-13 and supported by a General Fund loan in the amount of \$1,122,000 in FY 2013-14. As of June 30, 2017, the SSC had repaid \$81,000 of the General Fund loan and as of 2019 the loan had been forgiven through the Department of Finance.

Assembly Bill 98 (Chapter 27, Statutes of 2013) re-established a Seismic Safety subaccount, effective June 27, 2013, and imposed an assessment on each person who owns real property, commercial or residential, that is covered by a property insurance policy to fund the SSC. The California Department of Insurance (CDI) sets the assessment annually every August 1st for all commercial and residential earned property exposures reported during the previous calendar year. This assessment supports the operations of the SSC and allows a multi-year repayment of the General Fund loan. Assessment Methodology Pursuant to CIC section 12975.9, the annual assessment shall be based on the number of earned property exposures from both commercial and residential insurance policies, the amount required for the support of the SSC, the actual collection and administrative costs of the department, and the maintenance of an adequate reserve, but shall not exceed fifteen cents (\$0.15) per earned property exposure.

Gift Agreement, California Research and Assistance Fund

In August of 2007, the SSC was awarded a one-time allocation of funds, in the form of a Gift Agreement, from the California Research and Assistance Fund (CRAF). The CRAF funds the SSC research and education projects. As outlined in the CRAF Gift Agreement, the SSC is entitled to collect up to 10 percent overhead expenses for contracts awarded through the fund. Recipients of these funds develop products for the Commission and have an overhead limit of 25 percent. This fund is currently active.

Contract with the California Public Utilities Commission (CPUC)

Upon request, the SSC also receives reimbursement from the California Public Utilities Commission (CPUC). Pursuant to Assembly Bill No. 361, approved by the Governor, and under the California Emergency Services Act, the CPUC created an independent disaster council for the purposes of planning activities related to initial and subsequent

assessments of the Diablo Canyon nuclear power plant site. These assessments include the investigation and interpretation of environmental factors such as seismic safety. The bill requires the CPUC to convene, or continue, until August 26, 2015, an independent peer review panel to conduct an independent peer review of enhanced seismic studies and surveys of the Diablo Canyon Units 1 and 2 power plant, including the surrounding areas of the facility and nuclear waste storage.

In addition to the SSC, the independent peer review panel comprises the following: Energy Commission, the California Geological Survey of the Department of Conservation, the California Coastal Commission, the Office of Emergency Services, and the County of San Luis Obispo.

SSC Operating Budget Fiscal Year 2018/2019

Appropriated Operating Budget	\$1,316,000
Actual Operating expenses	\$1,316,000

Projects

The Ridgecrest Earthquake Sequence of July 2019

The Ridgecrest earthquake sequence struck Ridgecrest and Trona on July 4 and 5, 2019. The largest earthquakes were a moment magnitude (Mw) 6.4 on July 4 and a Mw 7.1 on July 5. Thousands of aftershocks were recorded and continue to occur. Fortunately, damage to the City of Ridgecrest was relatively localized and limited considering the sizes and proximity of these earthquakes. The town of Trona experienced similar levels of damage. However, facilities at the China Lake Naval Air Weapons Station were severely damaged. Total damage was estimated to be approximately \$4 billion.

On September 11, 2019 the Commission decided to produce a report within two months that would present findings, recommendations on policy, and lessons learned from this earthquake sequence. The priority recommendations presented in the report are as follows:

1. Increase Local Government Capabilities to More Effectively Respond to Disasters:

1a. Enhance Safety Assessment Program (SAP) Evaluator and Coordinator training opportunities for jurisdictions in rural regions of California. Step up efforts to provide table-top training exercises to expedite and improve the quality and priorities of safety assessments for damaged buildings and other structures. Re-evaluate the comprehension and effectiveness of structural assessment training curricula. Train appropriately qualified local government personnel to conduct rapid safety 5 assessments of all potential locations for emergency shelter centers after future earthquakes so that shelter deployments are in safe facilities without undue delays. Ensure, through training or mutual aid, that each local government has at least one trained SAP Coordinator on staff.

1b. Advise local government to modify the basic SAP placards to include information deemed pertinent to local responders and emergency managers.

1c. Advise local governments to pre-establish multiple potential shelter and emergency command center sites including pre-planning of grounds and facilities within those sites for respective purposes.

1d. Examine the strengths and weaknesses of jurisdictions relying solely on building owners' requests for safety assessments of damaged buildings rather than systematic safety assessments of entire neighborhoods.

1e. Examine the strengths and weaknesses of relying on mutual aid with neighboring jurisdictions for building safety assessment personnel rather than

requesting safety assessors and coordinators through the state Office of Emergency Services' SAP.

1f. Determine lessons learned including the need for a single, coordinated point of contact to address the public's questions about safety assessments of damaged buildings.

1g. To help minimize duplication of entering data in multiple forms, develop a consistent digital data format to retrieve pre-existing information and capture new information about each applicant for disaster assistance.

2. Mental Health Services: Continue to improve the delivery of mental health services to both emergency responders and the public at large after future disasters.

3. Businesses Emergency Response and Recovery Capabilities: Encourage businesses, including hotel owners and managers and food providers to better train their employees for disasters and support their rapid return to work following disasters such as by participating in the state's Outsmart Disaster Program.

4. Eligibility for Post-Disaster Government Funding: Reexamine federal and state eligibility thresholds as they apply to rural communities to provide more Public Assistance Grants and Individual Assistance Grants after future disasters. Propose basing the thresholds on a percentage of a jurisdiction's annual gross economic product.

5. Nonstructural Retrofits: Encourage building owners and occupants, especially in school districts, to undertake seismic retrofits of nonstructural components and contents during future maintenance, repairs, and alterations. Update and reissue the Division of the State Architect's and the Office of Emergency Services' advice on nonstructural bracing to public and private school facility personnel.

This project was completed in the winter of 2019.

Earthquake & Tsunami Classroom Curriculum

Humboldt State University partnered with the SSC for a project to deliver preparedness information to elementary school students and their families in the North Coast region. The framework of the project includes the development of a web-based interactive earthquake and tsunami education program that includes curriculum and preparedness information. This project will provide web-based materials that enhance the current state teaching framework and address the priority needs in the State for earthquake and tsunami outreach.

School districts in both Humboldt and Del Norte counties are using the children's book, "The Extraordinary Voyage of the Kanome" for a web-based interactive earthquake and tsunami education program for elementary-aged students and their families. Many web-based tsunami education tools have been developed and the book has been reprinted in both English and Spanish.

This project was completed in the spring of 2019.

The weblink to this report can be found at <http://ssc.ca.gov/disasters/tsunami.html>

Performance of Buildings Designed to California Building Code

One of the challenges in the earthquake policy field is bridging the public's expectation of the intent of the California Building Code seismic provisions with respect to building performance. In other words, what might a building look like after an earthquake if the building was designed to the current code? What might an existing older building that was retrofitted to code look like after an earthquake?

The SSC provided funding to the Pacific Earthquake Engineering Research Center (PEER) to create an educational document targeted to the general public. The final product is a double-sided, color info graphic brochure that is suitable for dissemination to the public.

PEER worked with a variety of organizations, companies, and governmental entities to synthesize and analyze information on the expectations of seismic behavior of buildings and their contents, when designed to the provisions of the current California Building Code. Topic areas included earthquake effects on the built environment when designed to the current California Building Code, and a general discussion of socio-economic impacts and expectations.

This educational document was not intended to develop a compendium of all information known about the California Building Code but presented specific data at a level that is understandable by the public.

This project was completed in the fall of 2019.

The weblink to this report can be found at: https://ssc.ca.gov/forms_pubs/ssc19-01.pdf

Post-Earthquake Business Recovery: Learning from Japan's Experiences

Japan and California have close economic and political ties. Japan is a major trading partner and many Japanese companies are in California. A major disaster that impacts one partner will have economic impacts on the other.

Japan has experienced many major earthquakes and has recovered relatively rapidly from each one. The SSC objective for this project was to identify key economic recovery and strategies of Japan and apply these to California. The SSC supported a project in partnership with San Jose State University to:

1. Survey and review post-disaster economic recovery measures, following the March 11, 2011 Great East Japan earthquake and tsunami, implemented by Japanese governments (national, prefectural, and local), and where possible assess the extent to which these measures were effective.
2. Develop and deliver seminars to Japanese companies in northern and southern California on the earthquake threat in California, including pertinent regulations designed to accelerate economic recovery and information on the limits of federal, state and local government assistance to business.
3. Develop and implement a survey of Japanese companies to determine their perceptions of needs in a post-earthquake environment to accelerate their recovery. This will serve as the basis for the development of a more broadly applicable business/economic recovery strategy for the State of California.
4. Present a final report to the SSC that identified the most successful economic recovery policies implemented in post-earthquake Japan.

Based on the results of this study, the SSC will consider a possible Phase II project that will incorporate existing policy recommendations gathered by the Commission and combine them with those implemented in Japan. This list could then be circulated among California businesses and industry with a request to identify those that may be most impactful on helping them recover after future major disasters in California.

This project was completed in the spring of 2019.

The weblink to this report can be found at: https://ssc.ca.gov/forms_pubs/19-04_post_earthquake.pdf

Homeowner's Guide to Earthquake Safety Update

Earthquakes are inevitable in California. They can occur at any time, without warning, be extremely destructive, and even deadly. In its continued efforts to reduce the earthquake risk to the residents of California, the Commission updated its "Homeowner's Guide to Earthquake Safety". This guide is designed to help homeowners prevent injuries, save lives, and avoid costly property damage from earthquakes. It provides information on:

- the most common earthquake-related hazards that can damage homes;
- how to find and then fix the potential hazards;
- how to find more information on earthquake safety

Properly constructed and strengthened homes are far less likely to collapse or be damaged during earthquakes. This Guide presents actions that a homeowner can follow that will lead to a safer home for residents who will need to rely on their home for shelter and safety following a damaging earthquake. In addition, under California law, sellers of homes built before 1960 must disclose known earthquake risks to buyers as part of the property sales process. A "Residential Earthquake Risk Disclosure Statement" is included in the Guide and must be filled out by the homeowner and provided to the potential buyer.

This project was completed in the winter of 2019.

The weblink for this report can be found at: https://ssc.ca.gov/forms_pubs/20-01_hog.pdf

ALERTWildfire Camera Network

ALERTWildfire is a consortium of three universities – the University of Nevada, Reno (UNR), University of California San Diego (UCSD), and the University of Oregon (UO) – which is providing access to state-of-the-art Pan-Tilt-Zoom (PTZ) fire cameras and associated tools to help firefighters and first responders: (1) discover/locate/confirm fire ignition, (2) quickly scale fire resources appropriately, (3) monitor fire behavior through containment, (4) during firestorms, better facilitate evacuations through enhanced situational awareness, and (5) ensure contained fires are monitored appropriately through their demise.

The SSC has supported the efforts of ALERTWildfire network since the inception of the development of the cameras. Dr. Neal Driscoll from UCSD has presented updates to the

Commission for over three years, including descriptions of the statewide expansion of the network.

Approximately 300 cameras were deployed across the state. It is anticipated that over 600 cameras will be deployed by the end of the project and they can be accessed by the public.

Review of Project Delays for the San Francisco Public Utilities Water System Improvement Program

The Wholesale Regional Water System Security and Reliability Act required the County and City of San Francisco Public Utilities Commission (SFPUC) to adopt a specified program of capital improvement projects designed to restore and improve the Bay Area regional water system that delivers water from the Hetch Hetchy Reservoir in Yosemite. Within 90 days of receiving a notice of project deletions or delays for the program, the SSC and the State Department of Public Health are to submit to the Joint Legislative Audit Committee written comments about the significance of the changes with respect to public health and safety. In November 2019, Commission staff completed its informal review of the SFPUC's Water System Improvement Program Annual Report for Fiscal Year 2018-19 pursuant to Water Code Section 73502. Overall completion of the program's construction is reportedly at over 97 percent. The SFPUC experienced several delays over the past year that are primarily environmental, legal and administrative. The SFPUC decided not to report them as delays pursuant to subsection (d) of Section 73502, which would have triggered a formal review of the seismic safety consequences of the delays by the SSC. Therefore, no review is required by the SSC.

The Seismic Level of Service Goals for the Program have been met. Administrative delays in closeout schedules continue for the San Joaquin region, the Peninsula region, and system security upgrades. The program's overall forecast for completion by December 2021 is unchanged but likely to be revised once the SFPUC adopts new delays. Of note, the new Calaveras Dam is now substantially complete. Construction is still underway for the Alameda Creek Diversion Dam (98% complete) and the Regional Groundwater Storage and Recovery Project (99%), but those are not seismic safety projects.

This project is still in progress.

Independent Peer Review Panel for Diablo Canyon Nuclear Power Plant

The SSC and many other state organizations assisted the California Energy Commission in the development of a report in response to AB 1632 (Blakeslee) in 2008. The legislation directed PG&E to use advanced three-dimensional seismic surveying and other methods to try to reduce the uncertainty regarding the plant's seismic hazards. In

2011, the California Public Utilities Commission (CPUC) created an Independent Peer Review Panel (IPRP) consisting of the CPUC, the SSC, the California Geological Survey, the California Energy Commission, the California Coastal Commission, and a representative from the County of San Louis Obispo. The IPRP has been reviewing and meeting as warranted with personnel from PG&E and various interveners since 2011.

In December 2016, the SSC received a copy of a letter from the Nuclear Regulatory Commission (NRC). SSC staff requested additional information regarding the Diablo Canyon Nuclear Power Plant seismic hazard assessment. The CPUC has extended the IPRP until August 2025. The IPRP periodically reviews documents from both the NRC and PG&E.

This project is still in progress.

HayWired: How a Magnitude 7.0 Scenario on the Hayward Fault Impacts the Bay Area

The US Geological Service (USGS) and Joint Venture Silicon Valley partnered with the SSC to research and strategize to enhance the resilience of Bay Area communities to climate change and natural hazards. The USGS, in collaboration with its partners and stakeholders, transforms hazard information into risk products that are useful at various levels of government and the private sector.

Currently, the USGS is leading a scenario, called HayWired, in the San Francisco Bay area of California. The HayWired scenario is a hypothetical but-realistic earthquake sequence initiating with a rupture of the Hayward fault. The earthquake is a magnitude 7.0 with an epicenter in Oakland, California. HayWired is a reference to the Hayward fault and speaks to the potential chaos caused by impacts to the wired and wireless world. More generally “wired” represents interconnectedness at many levels: interdependencies of lifeline, social connectivity through technology, and the ripple effects of damages and disruption encompassing the digital economy. The HayWired theme is particularly relevant for the Bay area, known for its leadership in digital communications and technology.

The HayWired scenario addresses risks of climate change and natural hazards, benefiting communities, businesses, governmental agencies and the general public in the Bay area.

The HayWired project study Volume I and Volume II were released in 2018 and Volume III will be released in 2020.