

2024

Annual Report



Cal OES
GOVERNOR'S OFFICE
OF EMERGENCY SERVICES

Alfred E. Alquist Seismic Safety Commission (SSC)

Improving the seismic safety and resiliency of California communities by providing resources and guidance, facilitating research, and fostering collaboration in earthquake preparedness, mitigation, and recovery.

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December 31, 2024

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Introduction

The Alfred E. Alquist Seismic Safety Commission (SSC) is pleased to present its 2024 annual report as required by Government Code §8589.75. The commission shall report annually to the Governor and Legislature on its findings, progress, and recommendations related to activities of the commission and the state toward higher levels of seismic safety and any other seismic safety issues. This report provides a brief overview of the SSC projects in 2024. Once projects are completed, all reports or studies are posted on the SSC “publications” website at https://ssc.ca.gov/forms_pubs/.

The SSC is an important seismic safety resource for the State of California dedicated to reducing earthquake risk for the people of California since 1975. The SSC improves the seismic safety and resiliency of California communities by providing resources and guidance, facilitating research, and fostering collaboration in earthquake preparedness, mitigation, and recovery. The SSC strives to ensure a coordinated framework for establishing earthquake safety policies and programs in California.

Sincerely,

Annde Ewertzen

Annde Ewertzen, Executive Director

SSC Vision

A California that is prepared for, safe from, and resilient to seismic hazards.

SSC Staff

Annde Ewertzen, Executive Director
Nicole Mendoza, Program Manager
Tanya Black, Administrative Processes Manager
Jia Wang-Connelly, Senior Structural Engineer
Don Duncan, Program Analyst
Harold Selby, Program Analyst



SSC Commissioners, as of December 31, 2024

Honorable David Rabbitt	Chair, Local Government
Honorable Debra Garnes	Vice Chair, Local Government
Stoyan Bumbalov	CA Building Standards Commission
<i>Alternate: Irina Brauzman</i>	
Ida A. Clair	CA Division of State Architect
<i>Alternate: Diane Gould</i>	
Alegría De La Cruz	Social Services
Joone Kim-Lopez	Public Utility
Kevin McGowan	Emergency Services
Dr. H. Kit Miyamoto	Structural Engineer
Honorable Anthony Portantino	CA State Senate
Honorable Freddie Rodriguez	State Assembly
<i>Alternate: Stephanie Nguyen</i>	
Honorable Cindy Silva	Local Government
Nancy Ward	CA Governor's Office of Emergency Services
<i>Alternate: Lori Nezhura</i>	
Vincent Wells	Fire Protection
Vacant	Planning
Vacant	Insurance



Seismic Safety Commission Background

The SSC was established in 1975 to advise the Governor, Legislature, state and local agencies, and the public about strategies to reduce earthquake risk. In 2020, the SSC became a unit within the Office of Emergency Services (Cal OES) (Government Code §8589.71, et seq.).

In coordination with Cal OES, SSC 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 assists in the state's mitigation efforts through collaboration with Cal OES and stakeholders. The SSC responds after earthquakes to gather information and recommends policy changes based on lessons learned.

The SSC is composed of 15 Commissioners: 10 appointed by the Governor, with expertise in earthquake or disaster-related fields or local government; 1 legislative member each from 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 six staff members.



Financial Summary

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

Insurance Fund

California Insurance Code (CIC) section 12975.9 established the Seismic Safety Account as a special account within the Insurance Fund to, upon appropriation by the Legislature, fund SSC and the California Department of Insurance (CDI). The Seismic Safety assessment is imposed on each person who owns real property, commercial or residential, covered by a property insurance policy. CDI calculates the assessment annually every August 1 for all commercial and residential earned property exposures reported during the previous calendar year. Pursuant to CIC section 12975.9(b), the annual assessment shall be based upon 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 CDI, and the maintenance of an adequate reserve, but shall not exceed fifteen cents (\$0.15) per earned property exposure.

General Fund

As part of the state's broader preparedness efforts, the SSC was reorganized under Cal OES as set forth in Government Code Section 8589.71. The Budget Act of 2021-22 allocated General Fund to the SSC to support the reorganization. The reorganization has increased the coordination efforts between SSC and Cal OES, along with other components of the state's multi-hazard strategy, earthquake preparedness, and broader distribution of seismic safety policies and recommendations.



California Research and Assistance Fund

In August of 2007, the SSC was awarded a one-time allocation of funds through a Gift Agreement from the California Research and Assistance Fund (CRAF). The CRAF funds SSC research and education projects. As the CRAF Gift Agreement outlines, the SSC is entitled to collect up to 10 percent of overhead expenses for contracts awarded through the fund.

The fund's recipients develop products for the SSC and have an overhead limit of 25 percent.

This fund is currently active.

Contract with the California Public Utilities Commission (CPUC)

The SSC contracts with the CPUC as an Independent Peer Review Panel (IPRP) member and receives reimbursement for staff time. IPRP is tasked with providing expertise to the CPUC while also assuring the public that Diablo Canyon Power Plant (DCPP) seismic studies are being performed appropriately. Members of the IPRP include representatives from CPUC, California Energy Commission, California Coastal Commission (CCC), Cal OES, California Geological Survey (CGS), SSC, and County of San Luis Obispo (SLO). IPRP activities are further discussed on pages 8-9.

SSC Operating Budget Fiscal Year 2023-2024

Insurance Fund—Seismic Safety Account	\$1,408,000
General Fund	\$351,000
California Research and Assistance Fund	\$700,000
California Public Utilities Commission	\$15,000



Reporting Requirements

The following provides background information on the SSC's reporting requirements.

Annual Reporting Requirement of the Seismic Safety Commission

This annual report to the Governor and Legislature includes how the State has developed multiple seismic safety risk reduction and recovery programs. Improved descriptions of what entities have been doing to reduce seismic risk will lead to a better understanding and improved cooperation between State departments, local governments, universities, and private industry. The Legislature finds numerous agencies at various levels of government have substantial responsibilities in earthquake preparedness and seismic safety and has explicitly designated nine agencies to report to the SSC. The SSC reporting is not limited to those agencies. Reports are available on the SSC websites.

In 2024, the SSC received reports from:

- California State University
- University of California
- California Department of Transportation

and presentations from:

- University of California, Pacific Earthquake Engineering Research Center (PEER)
- California Community Colleges
- California Geological Survey
- California Earthquake Authority
- Structural Engineers Association of California
- Dr. Charles Scawthorn, UC Berkeley, PEER
- Southern California Earthquake Center
- City and County of San Francisco
- San Francisco Fire Department
- Dr. H. Kit Miyamoto, Structural Engineer, Global CEO, & Humanitarian Coordinator

As an annual reporting requirement, this project is ongoing.



AB 1770 – New Annual Reporting Requirement Beginning January 1, 2026, Regarding Activities Related to Fire Stations and Seismic Safety

In September 2024, Government Code section 8989.75 was amended to authorize the SSC, in coordination with the Department of Forestry and Fire Protection and Cal OES, to do the following:

- Develop a list of all fire stations in California and each station's status in meeting the standards of the Essential Services Buildings Seismic Safety Act of 1986 (Article 1, commencing with Section 16000) of Chapter 2 of Division 12.5 of the Health and Safety Code) to determine which stations are adequately designed and constructed to minimize fire hazards and to resist the forces generated by earthquakes, gravity, and winds.
- Collect data on earthquake early warning technology implementation in all fire stations in California and their interest in implementing that technology.
- Identify potential sources funding for fire station seismic mitigation activities.

In addition, the amendment requires the SSC to provide an annual report to the Assembly Committee on Emergency Management and the Senate Committee on Governmental Organization beginning January 1, 2026, describing the SSC's actions and conclusions on the activities listed above.



Consultant Projects

The following provides background information on the SSC's consultant projects.

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

Pursuant to Water Code Section 73502, the Wholesale Regional Water System Security and Reliability Act required the City and County 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.

With any notice of project deletions or delays for the program, the State Water Resources Control Board and the SSC shall each submit written comments to the City of San Francisco and the Joint Legislative Audit Committee no later than 120 days after the date of notice of that change about the significance of the changes with respect to public health and safety.

SSC reviewed the "Fiscal Year (FY) 2023-2024 Annual Report Water System Improvement Program San Francisco Public Utilities Commission" dated September 1, 2024. Even with the progress achieved between July 1, 2023, and June 30, 2024, the overall percent completion of the Regional Program remained 98.9% due to the extension of some projects and overall program schedules.

All seismic reliability projects with a primary or secondary Level of Service (LOS) goal are 100% complete. As of June 30, 2024, the overall WSIP is forecast to be complete in June 2032, consistent with the current baseline schedule approved as part of the March 2024 Revised WSIP. The overall approved WSIP completion date is driven by the approved final administrative closeout completion date for the Alameda Creek Recapture Project, June 30, 2032.

This project is in progress.



Independent Peer Review Panel for Diablo Canyon Nuclear Power Plant

Under Senate Bill 846 (SB 846) of 2022, the IPRP was tasked with reviewing the seismic assessment for the Diablo Canyon Power Plant (DCPP) in a consulting role for the Diablo Canyon Independent Safety Committee (DCISC) (see Public Utilities Code § 712.1(e)(1)). SSC is a member of the IPRP.

On February 1, 2024, Pacific Gas and Electric Company (PG&E) issued a report, "Diablo Canyon Updated Seismic Assessment", updating their previous seismic assessment (PG&E, 2015) for the DCPP. The initial findings were shared with the public, PG&E, and the DCISC on 8/27/24. PG&E is expected to submit a written response addressing IPRP's findings. The IPRP will subsequently submit a second report addressing PG&E's response along with the IPRP's updated conclusions and recommendations. The findings are mainly about the seismic source characterization.

The seismic study of DCPP required by SB 846 (2022) is ongoing.

This project is in progress.



SSC Projects

The following provides background information on the SSC's projects.

Earthquake and Fire Following Earthquake Resilience of Mid-Rise Cold-Form Steel (CFS) Buildings with the University of California of San Diego (UCSD)

The SSC and UCSD executed a contract in March 2022, to improve the understanding of mid-rise CFS-framed building systems under earthquake and post-earthquake fire conditions. Central to this effort is earthquake testing, post-earthquake repair, earthquake re-testing, and live-fire testing of a CFS 10-story building constructed on the UCSD large high-performance outdoor shake table. Through shaking, implementation of repair strategies, and live-fire testing, the project team will facilitate an understanding of the performance, recovery time, and resiliency of these types of buildings when subject to earthquake and live-fire scenarios.

In January 2024, an amendment to the contract was signed to utilize Unmanned Aerial Vehicles (UAVs) to capture detailed characteristics of testing events to add a unique set of otherwise unobtainable data for correlation with other measurement sources (e.g., terrestrial visuals and point-wise analog sensors.)

Construction of the test specimen on the shake table began in late September 2024. The project is behind schedule due to delays of another project on the shake table. The schedule was adjusted, the material was delivered onsite, and construction began in early October 2024. Construction will continue through early 2025, followed by three months of instrumentation. Earthquake testing will begin in late Spring 2025 and live fire tests in Summer 2025.

This project is in progress.



Ferndale Earthquake Sequence: Understanding Impediments to Local Recovery in Rio Dell, California

In December 2022, a series of earthquakes struck near Ferndale, CA, with a magnitude 6.4 earthquake on December 20, followed by a magnitude 5.4 earthquake on January 1, 2023, and numerous aftershocks throughout the year. The small city of Rio Dell in Humboldt County suffered significant damage, with estimated total costs of \$40 million in the County with \$32 million of that in Rio Dell. Following the disaster, Humboldt County declared a local emergency and opened a local assistance center. Federal disaster aid was limited due to the damage not meeting FEMA's thresholds. In May 2023, the SSC held a hearing in Rio Dell to review the earthquake's impacts, particularly highlighting challenges for small, rural communities in disaster recovery. A report that focuses on key findings and recommended actions to support vulnerable communities in future disasters was approved and published on the SSC website.

This project is complete.

Regional Scale Consequences Assessment of Earthquake Sequence Scenarios in California with the Regents of the University of California, University of California Berkeley/ Pacific Earthquake Engineering Research Center (PEER)

PEER and the SSC partnered to improve understanding of the consequences and burden on emergency response should an earthquake like the 2023 Türkiye event happens in urban centers of California. Working with the United States Geological Survey (USGS), California Geological Survey (CGS), Southern California Earthquake Center (SCEC), and other subject matter experts, the SSC will identify two earthquake sequences (one in Southern California and one in Northern California), which are scientifically plausible, albeit rare, but likely to be devastating. PEER will assess the consequences of the selected earthquake scenarios at regional and local levels.

(Continued)



PEER will provide two reports:

- Volume 1: *Lessons from Historical Earthquakes and Hazard Analysis*
- Volume 2: Regional risk simulation on tectonics/triggered events, like Türkiye, modeling locations in Northern and Southern California entitled, *Regional Scale Consequence Assessment of Earthquake Sequence Scenarios in California*. The report will include regional scale damage assessments for a scenario in northern California (M7.21 Hayward/M7.23 Calaveras) and in southern California (M7.25 Newport-Inglewood/M7.05 Palos Verdes).

The reports have been delayed. Delivery will occur in 2025.

This project is in progress.

Paradigm Shift in Metric Evaluation Cost of an Earthquake and Recommendations on Creating Resilient Communities with Colorado State University/Interdependent Networked Community Resilience Modeling Environment (IN-CORE)

The SSC and Colorado State University have partnered to improve the understanding of the true cost of an earthquake and recommendations for creating resilient communities. Working with SSC, the IN-CORE project team will provide technical quantification for an earthquake equal to/equivalent to the intensity experienced by Rio Dell in the 2022 Ferndale earthquake sequence. IN-CORE qualification of metrics can provide a means to better understand the socio-economic disparities between communities and their ability to recover post-earthquake given resources and government aid. The towns of East Richmond Heights and Monte Sereno will be compared to Rio Dell, using similar damage in those locations as the damage that occurred 2022 Ferndale earthquake sequence. The IN-CORE project is ongoing. Delivery of the report will occur in 2025.

This project is in progress.



Quake Heroes Expos

The SSC signed a contract with the University of Southern California (USC) in June 2024 to provide a series of events featuring their Quake Heroes documentary film, which discusses the 1994 Northridge earthquake. The goal is to inspire preparedness activities of people across California. These events will include large multi-component Quake Heroes Expos with partner booths, displays, earthquake simulators, and a screening of the Quake Heroes film. SSC staff anticipate ten (10) events in primarily socially vulnerable communities throughout California. This contract also includes dubbing the film into Spanish and Chinese. SSC staff is working with USC on an events schedule and expects the expos to be completed by May 30, 2025.

This project is in progress.

Fire Station Seismic Vulnerability Project

The SSC approved the Fire Station Seismic Vulnerability Project, seeking to understand the structural and non-structural seismic vulnerability of the fire stations Statewide through the completion of a voluntary survey.

Objectives of the project include:

- Developing an inventory of fire stations and their status as it relates to the 1986 Essential Services Act
- Understanding of the potential structural vulnerabilities to help mitigation strategies and to learn about potential funding sources and barriers to funding
- Assessing risk through HAZUS DATA inputs
- Providing data to fire stations to aid in applying for Hazard Mitigation Assistance Grant funding

The survey was sent to fire stations throughout California, and SSC staff are in the data collection and research phase.

This project is in progress.



Earthquake and Climate Change Workshop

At the April 2024 meeting, the SSC approved a collaborative effort between SSC, USGS, CGS, and other partners to organize an Earthquake and Climate Change Workshop. The workshop intends to facilitate knowledge exchange among the earthquake and climate change community and explore collaborative opportunities to improve our communities' multi-hazard mitigation and resilience. SSC and stakeholders meet monthly to plan and discuss workshop topics and potential timelines. SSC staff anticipate the workshop will be held in March 2025.

This project is in progress.

Mobile Home Building Code Project

SSC staff submitted a Federal Emergency Management Agency (FEMA) Building Resilient Infrastructure and Communities (BRIC) 2023 Building Code Plus Up grant application to review current California Code of Regulations (CCR) as it relates to the tie-down, earthquake-resistant bracing systems and foundation systems for manufactured housing units. It will also review performance of these home types in recent earthquakes (e.g., Anchorage (2018), Ridgecrest (2019), and South Napa (2014).) In addition, modeling and testing of systems in a lab environment will be conducted. The level of protection being provided by current systems is unclear. This project seeks to update existing code and regulations and to develop seismic code provisions that currently do not exist.

The work will be performed by a yet-to-be determined contractor, with input from a project steering committee assembled by SSC staff. The project steering committee will lead the code adoption process after the code provisions are drafted.

Any recommended code updates, informed by the lab tests and analysis, if adopted Statewide will quantify and reasonably improve the level of protection to manufactured houses.

The BRIC Building Code Plus Up grant was approved by FEMA in late November 2024.

This project is in progress.



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