

# 2016 Annual Report

## Alfred E. Alquist

### Seismic Safety Commission

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#### Executive Summary

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The following annual report provides a brief overview of the projects that the Alfred E. Alquist Seismic Safety Commission (SSC) was engaged in 2016. Once the projects are concluded, any reports or studies produced are placed on the SSC “publications” webpage at <http://www.seismic.ca.gov/pub.html>

The SSC is the primary seismic resource for the State of California dedicated to reducing earthquake risk 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. Although the SSC does not have any governing authority on earthquake policy, the SSC strives to ensure a coordinated framework for establishing earthquake safety policies and programs in California.

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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 for earthquakes.

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**2016 Commission Membership**

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Honorable Michael Gardner, Chairperson	Local Government
Tracy Johnson, Vice Chairperson	Public Utilities
Senator Anthony Cannella	California State Senate
Assemblymember Ken Cooley	California State Assembly
Mark Ghilarducci	California Office of Emergency Services
Mia Marvelli	California Building Standards Commission
Chester Widom	California State Architect
Randy Goodwin	Architectural and Building Official
Dr. Margaret Hellweg	Seismology
Helen Knudson	Social Services
Dr. Kit Miyamoto	Structural Engineer
Ian Parkinson	Emergency Services
David Rabbitt	Local Government
Timothy Strack	Fire Protection
Mark Wheatley	Local Government
Vacant	Geotechnical
Vacant	Local Government
Vacant	Insurance

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**Commission Staff**

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Richard J. McCarthy, Executive Director  
Robert Anderson, Senior Engineering Geologist  
Lena Daniel, Administrative Manager  
Michael Orille, Project Analyst  
Henry Reyes, Structural Engineer (Special Projects)  
Fred Turner, Senior Structural Engineer  
Salina Valencia, Legislative/ Communications Director

The 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 under the State Business, Consumer Services and Housing Agency and consists of 20 commissioners. The Governor appoints 15 commissioners, chosen for their technical expertise and experience; the Senate and the Assembly each choose a representative from their respective memberships; and three state organizations are represented. The state representatives are the *California Office of Emergency Services, California Building Standards Commission, and the Division of the State Architect*. The SSC is supported by 6.5 staff members.

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**Commission Funding**

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The SSC is supported by the Insurance Fund managed by the California Department of Insurance. The SSC's operational budget for fiscal year (FY) 2016/2017 was \$1,238,000. Occasionally, the Commission will receive reimbursement funds for special projects. For projects supported by the *California Earthquake Research Fund*, the Commission is entitled to charge a 10% overhead.

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**Commission Budget Summary**

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**Budget Year 2016/2017**

Staff	California Insurance Fund
6.5	\$1,238,000

# Projects

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## **South Napa California (Post August 24, 2014 –Magnitude 6.0 Earthquake) Emergency Response Recovery and Lessons Learned**

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The Magnitude 6.0 South Napa Earthquake of August 24, 2014, is one of the first damaging earthquakes to strike a metropolitan area in the State of California in over two decades. During that time period, California’s population has grown by over 25%, the state’s economy has tripled, and a great many of the state’s new residents and businesses have never experienced a strong earthquake. It is almost guaranteed that there will be a major damaging earthquake somewhere in the state within the next 30 years and thus the South Napa earthquake is our “wake-up call” to renew investment and action to enhance the seismic resilience of communities, businesses, and residents across the state.

On October 8, 2014, the Alfred E. Alquist Seismic Safety Commission (Commission) held a hearing in American Canyon, CA to better understand impacts and lessons learned from local, State and federal representatives and residents and businesses impacted by the South Napa Earthquake. The Commission subsequently engaged the Pacific Earthquake Engineering Research (PEER) Center, headquartered at the University of California—Berkeley, to synthesize and analyze observations and studies resulting over the first year following the earthquake. As part of its work, PEER was asked to review relevant and transferable lessons from other recent earthquakes and to also consider how scientific, engineering and technological advances of the last few decades affected emergency response and recovery following the 2014 earthquake. PEER presented a set of draft findings of the study to the Commission at its January 14, 2016, meeting and then worked with the Commission’s staff to incorporate feedback into a revised draft that included 41 recommendations for consideration at the Commission’s workshop on March 9, 2016. At that time, the Commission identified 10 priority recommendations. The recommendations were organized around five key topical areas of Geosciences, Infrastructure, Buildings, People and Businesses, and Government and Institutions. The study was approved by the Commission and PEER delivered to the SSC in August 2016.

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## **Local Government Guidebook for Managing Risk of Collapse-Prone Buildings in California**

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California’s 14 million buildings include some of the most modern and earthquake-resistant in the world. However, older buildings could be damaged and a few – perhaps less than 5% - could collapse in severe shaking. This amount may seem small, but collapse can cause significant life loss, injuries and substantial social and economic disruption mounting to hundreds of billions of dollars.

The “Guide to Identify & Manage Seismic Risks of Collapse-Prone Buildings” summarizes California’s laws and regulations to help local governments identify and reduce collapse risks, as well as best practices that building owners can take to manage the risks. At the October 2015 hearing, the

SSC's ad hoc Committee on Collapse Prone Buildings presented a draft of a 14-page executive summary. The ad hoc committee was chaired by Commissioner Randy Goodwin and includes Commissioners Kit Miyamoto and Fuad Sweiss. The Committee is currently focused on developing a draft companion appendix to the "Guide to Identify & Manage Seismic Risks of Collapse-Prone Buildings".

SSC contracted with an editor to refine the appendix and provide recommendations to enhance graphics for the guide.

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## **California Earthquake Early Warning Benefit Analysis Report**

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The California Office of Emergency Services (CalOES) was tasked with leading a comprehensive effort to bring together experts, scientific members of government and private industry, to secure an effective and reliable Earthquake Early Warning System (EWS) in California.

In September 2013, Governor Jerry Brown signed Senate Bill 135 into law. This was a critical step forward in the overall effort to provide Californians with enough warning that an earthquake capable of producing intense ground shaking has occurred.

SB 135 requires that the CalOES will, in collaboration with the California Institute of Technology (Caltech), the California Geological Survey (CGS), the University of California (UC Berkeley), the United States Geological Survey (USGS), the SSC and other stakeholders, develop a comprehensive statewide EWS through a public/private partnership.

The SSC was part of the "California Office of Emergency Services Earthquake Early Warning Working Group." The partnership was dedicated to develop a needs-driven, user-driven California Early Earthquake Warning System (CEEWS). The working group completed a charter in 2014 to serve as a road map to developing a working system.

CalOES pursued a phased approach to a Benefit Analysis of CEEWS. The SSC funded phase-one of the Benefit Analysis of CEEWS. Per the request of CalOES in partnership with the SSC, the Pacific Earthquake Engineering Research (PEER) Center conducted research and studies to prepare a business case for CEEWS. PEER is a multi-institutional research & education center. The PEER study provided an objective analysis that assessed and validated the potential benefits of CEEWS. The objective was to establish the system's value to the business community and key sectors in order to promote public and employee safety, enhance business resiliency, and protect infrastructure critical to local communities and the economy. This project was an initial step toward what will be a more comprehensive analysis over time and as the system is developed.

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### **Senate Bill 1345: Seven Year Extension of Seismic Safety Commission Review of San Francisco Public Utilities Water Delivery System Retrofit Project**

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The Wholesale Regional Water System Security and Reliability Act required the City and County of San Francisco to adopt a specified program of capital improvement projects designed to restore and improve the Bay Area regional water system. Within 90 days of receiving changes to the program or postponements of the scheduled completion dates, the Seismic Safety Commission and the State Department of Public Health are to submit to the San Francisco Public Utilities Commission and the Joint Legislative Audit Committee written comments with regard to the significance of the change with respect to public health and safety.

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**Global Earthquake Model Foundation – Beyond Button Pushing Seismic Risk Assessment  
for California**

**Back to Normal: Earthquake Recovery Model**

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The SSC identified a serious lack of seismic research in the area of post-disaster economic recovery. This is especially true for the speedy recovery of the state’s building stock. Current computer earthquake programs (models) perform simulations that estimate consequences. SSC partnered with the Global Earthquake Model Foundation (GEM) to conduct a study from 2014-2016 on identifying and quantifying factors that can affect the accuracy and reliability of risk estimates, as well as in the development of tools capable of supporting complex models. GEM is an organization focused on developing damage models and sharing information on earthquake hazards to vulnerable communities worldwide. *Beyond Button Pushing Seismic Risk Assessment for California and Back to Normal: Earthquake Recovery Model* are the two projects that were developed by GEM Foundation in partnership with SSC.

***Beyond Button Pushing Seismic Risk Assessment for California***

SSC engaged the GEM Foundation to quantify and discuss the impact of various assumptions on earthquake model results for California, and also to investigate the treatment of uncertainty within the model. The results of this study will help identify the key factors that influence the risk results in California and improve understanding of the seismic risk in the state. Such improved knowledge can be leveraged by a wide range of stakeholders within the community to: enhance earthquake risk mitigation strategies; develop appropriate emergency preparedness and response plans; inform risk transfer and insurance mechanisms; and better manage risk-sensitive investment portfolios.

The project showed how important the quantification of uncertainty is in estimating and understanding California’s earthquake risk using OpenQuake — GEM Foundation’s state-of-the-art open source earthquake hazard and risk assessment software. With OpenQuake’s plug-and-play capabilities, expert users can individually select or substitute every model component, data, and assumption. This feature will help model users and decision makers to: 1) ‘ask the right questions’ when evaluating model results; 2) better interpret risk assessment results and gain trust in model results; and 3) make better risk management decisions.

***Back to Normal: Earthquake Recovery Model***

Given the high level of earthquake risk in California, all communities need to be prepared to respond to and recover from the impacts of a potentially devastating earthquake. Although there has been significant research on the estimation of direct economic losses immediately after an

earthquake, there has not been enough research about long-term recovery, and even less in the development and application of computer simulation models. Moreover, the models developed so far have not successfully captured the complexity of the recovery process. Recovery depends on many factors (such as the socio-economic conditions of the affected area) that are usually difficult to measure, understand and apply to predicting or modelling the recovery process.

To address this gap, SSC engaged the GEM Foundation and the University of California at Los Angeles (UCLA), Department of Civil and Environmental Engineering, to develop: a) a methodology and an open-source and transparent software tool to estimate recovery states and recovery times following an earthquake; and b) to investigate the effect of external socio-economic factors on these recovery times. This project aimed to quantify the effectiveness of specific actions to speed recovery of the building stock. In order to accomplish this, the project produced the necessary technical science for the development of computer simulation models to estimate building recovery states and recovery times following an earthquake.

The Beyond Button Pushing Seismic Risk Assessment for California and Back to Normal: Earthquake Recovery Model projects were approved by SSC and will be completed in 2017.

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### **Independent Peer Review Panel for Diablo Canyon Nuclear Power Plant**

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The SSC with a number of 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 3 dimensional seismic surveying and other methods to try to reduce the uncertainty in information regarding the seismic hazard. In 2011 The California Public Utilities Commission created an Independent Peer Review Panel (IPRP) consisting of the California Public Utilities Commission (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 the Pacific Gas and Electric Company and various interveners since 2011. The IPRP was focused on reviewing seismic hazards with respect to the Diablo Canyon Nuclear Power Plant since the shutdown of the San Onofre Nuclear Generating Station.

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 lifetime of the IPRP until August of 2025.

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### **Earthquake & Tsunami Classroom Curriculum**

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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 will include curriculum and preparedness information. This project will provide web based materials that will fit into 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 to deliver earthquake and tsunami preparedness information to elementary aged students and their families. A number of web based tsunami education tools have been developed and the book has been reprinted in English as well as Spanish.

An update of this project will be presented to the SSC at the January 2017 SSC meeting. This project is scheduled for completion in the spring of 2018.

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## **Community & Media Outreach**

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One of the SSC's primary objectives is to assist the residents in the State of California to become aware of the risks and preparation associated with earthquakes and other natural disasters. In order to enhance the impact of the SSC's continued work towards assisting the residents of California, the SSC is currently in contract through an interagency agreement with the Regents of the University of California to create effective public awareness, engagement with and community practice for earthquake preparedness and disaster response in California.

The purpose of the community and outreach project is to create and leverage a network of services and media partners who will highlight efforts supported and enabled by the SSC. The community and media outreach project will significantly expand the number, quality of channels and media types used to communicate information and build ongoing public awareness of the importance of preparedness for earthquakes and other natural disasters.

This project is ongoing through March 2018.

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## **HayWired: How Earthquakes Damage Communication and Information Technology in the Bay Area**

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The United States 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 transform hazard information into risk products that are useful for decision and policy makers across scales of government and the private sectors.

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 main shock earthquake is a magnitude 7.0 earthquake with the hypocenter 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 throughout the economy encompassing the digital economy. The HayWired theme is particularly apropos for the Bay Area, a leader 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, California. The HayWired project is slated to be released in the spring of 2018.

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### **California Small Businesses Earthquake Education & Outreach**

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California’s Small Business Development Centers (CASBDC) network is one of the State’s primary resource partners for small business development. The CASBDC consortium of over 42 service and administrative lead centers play a leading role in driving the state’s economy by providing small businesses and entrepreneurs with confidential, no-cost advising and expert training. The CASBDC network works closely with 65,000 businesses and entrepreneurs across California annually.

In an effort to improve awareness of disaster preparedness amongst the State’s small businesses, the SSC contracted with the CASBDC in 2013 and 2014 to assess disaster preparedness amongst California small businesses in the event of a natural disaster. This project t was two-fold: First was to conduct a survey of California small businesses and secondly, to create of the California Small Business Disaster Resource Guide. The project found that the State’s small business owners are focused on keeping their businesses growing and thriving. Preparing for a disaster is not always an active priority for small business owners.

In 2016, the SSC contracted with the CASBDC to host a series of educational workshops targeting potential entrepreneurs as well as the over 3.4 million business owners in California. The purpose of the educational sessions will be to provide businesses with information they need to be prepared for disruption caused by earthquakes and other natural disasters. These workshops assist small business owner in planning for business continuity during and after earthquakes. Training workshops are scheduled to begin in 2017 and continue through 2018.

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### **Earthquake Resiliency in California – Report and Assessment Jet Propulsion Laboratory/ National Aeronautics and Space Administration**

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Situational awareness following earthquakes or other natural disasters is critical for state, county and local officials for proficient emergency response. Understanding the scope of the damage, identifying where critical infrastructure is compromised and where it is still working is necessary for getting needed supplies to locations where people are at risk in the most efficient way possible.

The SSC partnered with the Jet Propulsion Laboratory (JPL)/ National Aeronautics and Space Authority (NASA) to investigate and assess the potential for JPL-developed technology and capabilities that could help reduce earthquake hazards and improve earthquake resiliency within California.

In June 2016, the Jet Propulsion Laboratory (JPL) completed a collaboration with the SSC on a pilot project (Phase-I) to identify JPL technological capabilities that could help California communities and businesses mitigate loss and speed recovery in the event of natural disasters, including but not limited to earthquakes. JPL has identified several space-borne, airborne, and in-situ technologies that could be brought to bear in the areas of Earthquake Damage & Hazard Assessment and Search & Rescue. Three technologies were identified in the area of hazard and damage assessment and one technology identified in the area of search and rescue.

Space-borne radar technology allows for fault detection and damage assessment of earthquake impacts on critical infrastructure such as bridges, airports, hospitals and other locations pre-identified by federal, state and local partners. Space-borne radar imagery may be used to produce regional scale maps of potential damage that would assist state in locating areas in need of further reconnaissance or assistance. Detailed, high spatial resolution maps of the surface ruptures caused by earthquakes would be used by in evaluating damage to roads and other structures.

Airborne radar technology provides the opportunity for fault mapping and damage assessment. Airborne fault mapping and damage assessment provides targeted damage assessment of critical infrastructure (e.g., Sacramento levees) at higher resolution than can be provided by space-borne radar. Airborne radar surveys provide an accurate and efficient method for assessing damage over a large area.

Airborne spectroscopy technology can assist governments in identifying and assessing natural gas leaks triggered by earthquakes in the days and weeks following them. In-situ radar technology has the ability to help Search & Rescue teams locate survivors trapped in collapsed buildings.

The final report for this project was released in the spring of 2016.

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## **Post-Earthquake Business Recovery: Learning from Japan's Experience**

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As of 2014 there were more than 1,470 Japanese companies in California, with more than 224,000 employees, and an annual payroll of \$11 billion. Close to 96% of these employees are local hires. Japan is the largest foreign investor nation in California, accounting for 24.2% of overall foreign direct investment. Due to the unfortunate occurrence of the Great Tohoku Earthquake of March 11, 2011, and the Kumamoto Earthquakes, many of the parent companies in Japan have suffered the consequences of damaging earthquakes. This is in contrast to California which has not had a damaging, large metropolitan earthquake since the January 17, 1994 Northridge Earthquake. In the post Tohoku Earthquake period, the Japanese national and local governments implemented a variety of measures to incentivize the recovery, return, and growth, of businesses in the afflicted regions. This provides an opportunity for the State of California to learn from the experience of the Japanese to identify post earthquake economic recovery measures that could apply to California.

Japanese companies in California are very keen to learn more about what they can do to reduce earthquake-caused damage at their facilities, and the kind(s) of assistance they can expect from federal, state and local governments for a speedy recovery. The SSC partnered with San Jose State University to work with California business partners in an effort to accelerate post-earthquake economic recovery and to learn from experiences of parent companies located in Japan. This project consists of a survey and review of economic recovery measures implemented by the Japanese governments (national and local), and where possible the extent to which these measures were effective. This project will consist of the development and delivery of seminars to Japanese companies in northern and southern California to educate them on the earthquake threat in California, including pertinent regulations designed to accelerate economic recovery and limitations to the extent US federal, state and local governments can assist specific businesses. A survey of Japanese companies will determine the perceptions of needs in a post-earthquake environment and accelerate recovery. This will serve as the basis for the development of a more broadly applicable business/economic recovery strategy for the State of California.

This final report for this project is scheduled to be delivered in the fall of 2017.

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### **Post-Earthquake Fire Performance of a Light-Gauge Cold-Formed Steel Framed Building**

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The need for low cost, multi-hazard resilient buildings constructed of sustainable low-carbon footprint materials is urgent. Light-gauge cold-formed steel (CFS) framed multi-story buildings for such occupancies as hospitals, medical buildings and schools have the potential to support this urgent need. There are numerous benefits of CFS-framed structures. They have lower installation and maintenance costs as compared with other systems, are durable, ductile, lightweight, and manufactured from recycled materials. In addition, consistency in material behavior and low material costs are added benefits compared with their wood-framing counterparts. CFS-framed structure aligns with the performance needs in moderate to high seismic zones. These many beneficial attributes lead to a highly sustainable construction type for housing communities. However, the lack of full-scale, system-level test data documenting the seismic response at key performance levels, particularly for CFS-buildings above 3-4 stories, is needed to substantiate its benefits to the community.

Presently, design engineers and contractors are precluded from constructing mid-rise CFS-framed buildings due to limited understanding of their performance even under low-level earthquake motions. In addition, post-earthquake fire performance of CFS-framed buildings above 3-4 stories is completely unknown, and is therefore needed to support future acceptance of such buildings in earthquake-prone areas.

In spring 2016, the SSC partnered with the University of California, San Diego & Worcester Polytechnic Institute to evaluate post-earthquake fire performance to a CFS-multi story building. The test was performed on the University of California San Diego's Large High-Performance Outdoor Shake Table (LHPOST). The CFS-multi story building was subjected to a suite of earthquake motions of increasing severity to assess damage progression. The results of this test are being evaluated and a final report will be delivered to the Commission in the fall of 2017.

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## **Inspection of Earthquake and Fire Damaged Buildings Using Unmanned Aerial Vehicles (UAVs)**

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Inspection of Earthquake and Fire Damaged Buildings using Unmanned Aerial Vehicles (UAVs) UAVs often referred to as drones, have become an option for a broad range of application scenarios. Relatively inexpensive, lightweight and easily deployable, UAVs provide a viable alternative to traditional airborne vehicles such as helicopters. Modern devices have scaled UAVs to very small sizes making them a powerful tool for post-disaster reconnaissance. The SSC and the University of California, San Diego (UCSD) partnered to perform a study of the diagnostic value of UAV data for structural health assessments pre-and post-natural disaster(s). UAVs can swiftly, systematically and reliably inspect and document the health of structures before, during and after extreme events. With this capability field teams have the ability to rapidly inspect damage by capturing site-specific data from a broad range of perspectives.

In the spring of 2016 the SSC partnered with UCSD in a project that included the construction of a multi-story light-gauge cold-formed steel (CFS) building on UCSD's Large High- Performance Outdoor Shake Table (LHPOST). The earthquake testing of the multi story CFS building on the LHPOST allowed a unique research opportunity; UAV-based inspections of earthquake and fire damaged buildings both pre and post disaster. Under controlled conditions UAVs navigated the CFS building and took structural health assessment and data collection, pre-event and post-event. The UAVs allowed for the rapid inspection of the earthquake damaged CFS building. A final report with the findings of the inspections will be delivered to the SSC in the fall of 2017.

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## **Digitizing Construction Documents of Buildings in Napa for Research & Standards Development**

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After past damaging California earthquakes, the SSC has assisted engineers and scientists in conducting research to assist in the development of California building codes. Such research required obtaining access to construction plans, structural calculations, and other information about key buildings.

After the August 2014 Napa Earthquake, reconnaissance teams observed good and bad performance of buildings, compared observations to nearby ground motions, and generated first impressions about the adequacy of California's regulations. This was accomplished with little or no knowledge about when key buildings were constructed or retrofitted, how well they were designed or built, what codes and standards were used, or whether the observed damage was symptomatic of the limitations of current or former codes, or a reflection of quality in design and construction, or the effectiveness of regulatory enforcement. The SSC has entered into a project with the Pacific Earthquake Engineering Research Center (PEER) to digitize construction documents for up to 60 NAPA buildings. The digitization of these documents will allow for future research and possible changes to codes and standards based on a more comprehensive understanding on how buildings perform in an earthquake.

The digitization of the construction documents are to be completed in the fall of 2017.

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**Defining the Impacts & Expectations of Structures  
Built to Current California Building Code**

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Most Californians falsely believe that new buildings are earthquake proof. The Pacific Earthquake Engineering Research Center (PEER) teamed with the SSC to explain the impacts and expectations on buildings built to current California Building Code in the event of design-level earthquake motions.

PEER will work cooperatively with a variety of organizations, companies and governmental entities to synthesize and analyze results obtained in this study, regarding the expectations of seismic behavior of buildings and their contents, when designed to the provisions of the current California Building Code. The targeted audience for the document is the general (i.e. non-technical, non-engineering) public. The purpose of the document is to better educate the general public and mitigate the risk to California posed by earthquakes. Topic areas that will be studied include earthquake effects on the built environment when designed to the current Building Code, and a general discussion of socio-economic impacts and expectations.

This project is expected to be completed and ready in the spring of 2018.