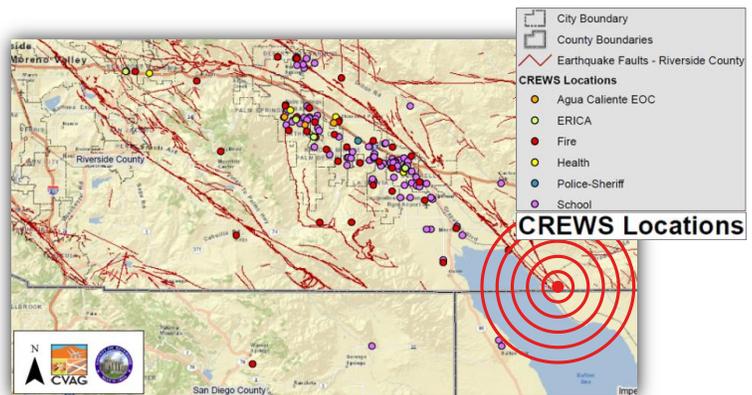


California Seismic Safety Commission

Coachella Valley (CREWS) and Imperial Valley (ICREWS) Regional Earthquake Warning Systems

Background

Stand Alone Earthquake Warning Systems have been operational, deployed, and validated over the past 11 years in the Coachella Valley. On December 7, 2009, the Coachella Valley Association of Governments (CVAG) Executive Committee approved CVAG to build upon this success and approved the creation of a Public/Private Partnership with Coachella Valley Emergency Manager's Association, three Coachella Valley School Districts, and Seismic Warning Systems, Inc. to implement a networked earthquake warning system to build on the Coachella Valley's initial standalone success and afford enhanced warning time and initiate mitigation services. This is California's first Regional Earthquake Warning initiative called the Coachella Valley Regional Earthquake Warning System (CREWS) project. The project will provide earthquake warning to 136 project sites (38 Fire Stations, 4 Public Health Department Facilities, 3 Tribal Nation's EOC's, 4 Interoperable Communications facilities, and 87 Public Schools) throughout the Coachella Valley (Beaumont to Salton City).



Through this initiative, Imperial County began its own project called Imperial County Regional Earthquake Project (ICREWS) to protect their fire stations from what occurred during the 7.2 El Mayor – Cucapah earthquake (Sunday, April 4, 2010). The Calexico Fire Station's (Fire station #1) bay doors were closed prior to the earthquake's damaging waves arriving and as a result caused the apparatus bay doors to jam in the closed position. According to the station's Fire Chief Pete Mercado, it took their 3 person fire station crew more than 15 minutes to realign the rails and door guides with forcible entry tools to force the doors open while tones were being received reporting natural gas leaks, power outages, and possible structure fires. Field reports from the Sierra El Mayor earthquake indicated significant structural and non-structural impacts to schools in the Imperial County.

For CVAG, CREWS represents a proven, cost effective, immediately implementable earthquake warning system for the Coachella Valley, and will be the first user driven earthquake early warning network in the United States. With a proposed budget of \$1.725 million, CREWS/ICREWS demonstrates that a public-private approach to regional preparedness and mitigation needs can be cost effective and implemented quicker than other potential programs of this nature. CREWS and ICREWS will provide earthquake warning throughout two, at risk counties. Both of these earthquake warning projects will provide earthquake warning to thousands of first responders, healthcare workers, tribal entities, utility staff, public transit employees and public schools personnel and students. These two regional systems will monitor the Southern Section of the San Andreas and San Jacinto Fault zones which are two of the



most active and potentially devastating fault zones in So. California. Over 150 miles will be covered and eventually several hundred government buildings and businesses will receive earthquake warning in this at risk area.

Project Objectives

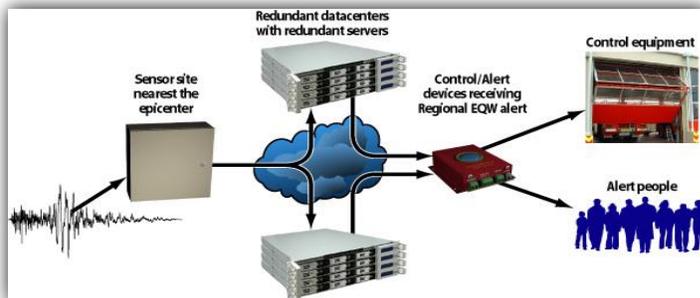
CREWS objectives are to save lives, prevent and reduce injuries (which will help mitigate the surge on medical services), and protect critical infrastructure systems by providing earthquake warning before damaging ground shaking occurs. The earthquake warning will alert people to take protective actions and will integrate into critical building and facility systems. Depending on the distance from the start of the earthquake, up to 35 seconds of warning could be provided to facilities protected. Initially, 136 facilities will receive earthquake warning in the Coachella Valley region. These facilities include schools, fire stations, public safety dispatch centers, critical health facilities, tribal emergency operation centers and governmental offices to help mitigate fires following earthquake, medical surge, and ensure critical response and recovery assets are available following a large earthquake. CREWS represents a regionally organized response to a regional threat and will accelerate the adoption and deployment of earthquake warning and provide essential protection. The project does not preclude the public partners from participating in a Federal/State operated system should a practical Federal/State warning system become operational.

An important component of the regional earthquake warning system is to ensure appropriate earthquake warning response procedures and initiate a sustainable education and training program to fully realize earthquake warning benefits and mitigation. As a partner of CREWS, the Coachella Valley Emergency Managers will be responsible for the training and education component of this project.

Stakeholders believe this project will have a positive economic impact as the community will have “earthquake intelligence” that will reduce public safety interruption, enhance our earthquake resiliency, and create jobs in one of the toughest employment markets in the State.

Concept of Operations

Our technology partner, Seismic Warning Systems, Inc. will instrument sections of surrounding faults and maintain the regional network. Sensors will be placed every 6-12 km along selected faults, which will place a sensor within 3-6 km (on average) of likely epicenters. These devices will analyze P-waves to



determine expected earthquake intensity and send advanced earthquake warning alerts for large earthquakes via secure data centers which will allow the detection of earthquakes to be distributed via NetQuakeGuards in less than one second to hundreds of the aforementioned personnel who will

have the warning integrated into their building. CREWS earthquake warning recipients will receive a warning announcement over PA systems, open fire station apparatus room doors, turn on lights and display warnings on public safety and utility dispatch monitors. However, the beneficiaries of



earthquake warning in the CREWS project could add additional mitigation services at a cost not included in the CREWS project such as starting emergency generators, shut down or back-up critical data systems, and turn on and off valves.

Partnerships & Milestones

The County of Riverside, as the grant applicant, has the commitment and support of the Riverside County Board of Supervisors, Southern California Association of Governments (SCAG), the Coachella Valley Association of Governments (CVAG), three public School District Boards representing 82 schools, Coachella Valley cities, the Eastern Riverside County Interoperable Communications Authority (ERICA), and the California Seismic Safety Commission to name a few.

CREWS letters or resolutions of support/endorsement:

- *Riverside County Board of Supervisors*
- *Congresswoman Mary Bono-Mack, 45th Congressional District*
- *Assemblyman V. Manuel Perez, 88th Assembly District*
- *Assemblyman Brian Nestande, 64th Assembly District*
- *Senator Bill Emmerson, 37th District*
- *Senator Juan Vargas, 40th District*
- *Inland Empire Caucus- (Chair) Senator Bill Emmerson, 37th District*
- *Riverside County Supervisor John Benoit, 4th District*
- *California Seismic Safety Commission, Richard McCarthy, Executive Director*
- *Dennis Mileti, Professor and Director Emeritus- Natural Hazard Center- Institute of Behavioral Science, University of Colorado at Boulder, Commissioner Emeritus, California Seismic Safety Commission*
- *Coachella Valley Emergency Managers Association*
- *Coachella Valley Unified School District*
- *Desert Sands Unified School District*
- *Palm Springs Unified School District*
- *C. Mikel Oglesby- General Manager, Sunline Transit Agency*
- *Southern California Association of Governments (SCAG) Regional Council*
- *Coachella Valley iHub,*

Public/Private Business Model

For the CREWS/ICREWS pilot project, the first recipients of the NetQuakeGuards will receive the earthquake warning service for a period of five years at no cost. After five years, annual subscription costs will be offset by a set number of new business subscribers. It is anticipated that business subscribers will effectively “underwrite” the local government and schools annual earthquake warning subscription cost. This public/private model ensures that on-going operations, maintenance and upgrades are the vendor’s responsibility. Thus municipalities and the State are not exposed to an on-going need for funding and support and ensure that the system will operate at optimal performance. CREWS along with other participating regions collectively will produce scores of jobs further stimulating our depressed regional economies.

Grants Pending or Received

- The Riverside County Operational Area applied for and received a NOI approval for consideration for the CREWS project at a cost of \$1.5 Million dollars on December 1, 2011. The grant is under review for funding by Cal EMA staff. If approved, the Coachella Valley Regional Earthquake Warning System (CREWS) will move forward for Federal Emergency Management Agency (FEMA) review for final approval for funding. The project would be fully implemented within 36 months.
- The Imperial County Operational Area with the assistance of CVAG received a Cal EMA Hazard Mitigation Grant (DR-1911) on November 9, 2011 to protect 20 fire, police and hospital facilities in Imperial County with earthquake warning service for \$225,000. ICREWS is currently being reviewed by FEMA for final approval

