



## **NEVADA EARTHQUAKE SAFETY COUNCIL**

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May 26, 2006

TO: Mr. Ron Lynn, Chairman, Nevada Earthquake Safety Council  
Board of Directors, Nevada Earthquake Safety Council

FROM: Jim Reagan, Chairman, Strategic Planning Committee

RE: Annual Report of Activities for Plan Year 2005

I am pleased to provide a summary of activities and efforts achieved by the Standing Committees and members of the Nevada Earthquake Safety Council for the calendar year 2005. As with previous years, the committee members and members of the council have made great progress toward the mission and goals of the council and earthquake safety in Nevada. This year's accomplishments include:

### EDUCATION COMMITTEE

- "Drop, Cover, and Hold On" was the theme for Earthquake Awareness Week, February 28 to March 5, 2005.
- Packets were sent to approximately 650 Nevada schools containing poster contest rules, classroom hazard hunt, home hazard hunt activity, earthquake drill, evacuation checklist, and "Beat the Quake" flyer.
- The University of Nevada, Reno held an earthquake exercise on 1 February 2005.
- New monitors for earthquakes were installed in the hallways of the Nevada Seismological Laboratory thanks to the efforts of John Louie.
- Students from the Reno-area are learning how to use the K-12 seismic network.
- Committee members identified opportunities for education through the National Science Foundation's EarthScope Program.
- The Nevada Seismological Laboratory, the Nevada Bureau of Mines and Geology, and the geoscience departments at UNLV and UNR are engaged in the scientific aspects of EarthScope. Which has three major components: (1) deep drilling across the San Andreas, (2) deployment of seismic instruments in 48 states and Alaska, and (3) deployment of global positioning system (GPS) and better understand earthquakes and volcanoes.
- Committee members provided volunteers for a workshop and earthquake training for teachers, at the Association of Engineering Geologists (AEG) annual meeting in Las Vegas on September 24.

### RESEARCH & INFORMATION COMMITTEE

- A project to estimate the damage and economic cost of historical earthquakes in Nevada has been completed. 19 earthquakes analyzed (from 1868 to 1994) resulted in only \$17 million in damage (in 2003 dollars). The figure is low primarily because so few people lived in the affected areas. Using FEMA's HAZUS model, these same earthquakes today would cause \$1.57 billion in damage and economic loss.
- Committee members are reviewing the fault database in the latest version of HAZUS, and making recommendations to improve this database, which currently only lists the 130 most active faults in the state and excludes some faults that are important for earthquake planning scenarios.
- The editor of the Nevada Bureau of Mines and Geology, is adding a set of standard maps for county seats throughout Nevada to the NESC Web site. The maps will be incorporated into a Nevada Bureau of Mines and Geology report on loss estimation from future earthquakes using the Federal Emergency Management Agency's HAZUS program.

- U.S. Geological Survey has produced a new set of earthquake probability maps.
- These can be accessed on the Web through the NESC Web site. The maps show the probability of an earthquake of a given magnitude (e.g., 5, 6, 6.5, or 7) occurring over a given period of time (e.g., 50 years) within 50 kilometers of a particular location (entered either as a zip code or longitude and latitude). These maps are particularly useful in demonstrating earthquake hazard to the lay public.
- The California Seismic Safety Commission, in cooperation with the California Geological Survey, the Nevada Earthquake Safety Council, the Nevada Bureau of Mines and Geology, and the Seismological Laboratory, has produced a new “Earthquake Shaking Potential Map for Portions of Eastern California and Western Nevada.”
- Craig dePolo attended the August 2005 national earthquake program managers' meeting, which was sponsored by the Central United States Earthquake Consortium (CUSEC) and FEMA. NESC was praised at this meeting as one of the most successful State seismic safety councils or commissions in the country.
- The Association of Engineering Geologists (AEG) held a good symposium on earthquake hazards in the Southwest during its annual meeting in September in Las Vegas. The Las Vegas Valley fault system is being accepted as being an active faults system in the Holocene (the last 10,000 years).

#### POLICY COMMITTEE

- No bills regarding earthquake issues have been introduced in the current session of the Legislature. Such bills will be developed and introduced in the 2006 year.
- The Nevada Public Agency Insurance Pool is working on a document on non-structural mitigation. They are using materials from the NESC non-structural mitigation workshop in the spring of 2004.
- Members provided a presentation on Rural Water System Earthquake Preparedness and earthquake effects on water system disruptions affecting more than 50% of the system and/or requiring more than one week for recovery of service, structural damage to treatment facilities, and potential water contamination and the need for boil-water orders. The American Lifelines Alliance has developed guidelines for designing water systems for seismic safety, and the Nevada Public Agency Insurance Pool has made two presentations, and plan to make presentations in Mesquite and at the Nevada Rural Water Association.

#### SCIENTIFIC AND INFORMATIONAL PRESENTATIONS:

##### Ad Hoc Committee on Rockery Walls

- Members presented a draft copy of guidelines for construction of rockery walls (dated 14 February 2005). The guidelines were developed by the Structural Committee of the Southern Nevada Building Officials. There was considerable input from interested parties in Northern Nevada on the draft guidelines. It was determined that further investigation was necessary to develop guidelines for the construction of rockery walls that could be adopted as part of the building code. A subcommittee was assigned to reevaluate the role of the Council in this process.

##### Making Your School Earthquake Safe

- Gloria Leggio, Jim O'Donnell, Alex Balint, and Spencer Swan talked about a grant for renovations at the old Las Vegas High School (built in the 1930s, now the Las Vegas Academy). During the 2003-2004 school year about 100 students were involved in earthquake mitigation at the school. They initially focused on nonstructural mitigation, but they have also included some structural changes in a final phase.

##### Presentations of Awards for Excellence

##### Awards for Excellence to:

- Gloria Leggio and Jim O'Donnell for their mitigation efforts at the Las Vegas Academy.
- Dan O'Brien for work by the State of Nevada Public Works Board for remodeling the former Carson City Courthouse, including earthquake retrofit features.
- Ron Lynn and the Clark County Department of Development Services for the nonstructural mitigation of the Clark County Operations Center West Building.
- Assemblyman Bernie Anderson and the Nevada Legislature for sponsorship and passage of Assembly Bill 57 in the 2003 legislative session.

### Discussion Of The Kinkead Building's Performance During An Earthquake

- Dan O'Brien described the Kinkead building in Carson City, which was built in 1974-75 which has a sloping floor, 6 inches of deflection within a 20-foot distance.
- State Public Works Board investigated the costs of fixing the building and commissioned a study by Blakely, Johnson, and Ghusn. The bottom-line cost would be about \$9 million to \$12 million to fix the problems and bring the building up to modern code.
- Members provided a detailed discussion of the technical aspects of the investigation and structural report.

### The New FEMA - HAZUS Planning Grant

- Gary Johnson discussed the project that is being funded by FEMA and NBMG to update the basic information that feeds into HAZUS. He and Christine Arritt are the principal investigators on this project. This will include better locations and information on critical facilities (schools, hospitals, etc.) than is currently in the HAZUS default files. They expect to complete the project within a year.

### Earthquakes in Southern Nevada - Outreach Efforts

- Gaye Coté, Director and Project Administrator for the UNLV Earthquakes in Southern Nevada Project, spoke about their efforts in public outreach. They have developed a series of educational PowerPoint presentations to increase basic knowledge of the science, geotechnical aspects, and structural engineering techniques and considerations of earthquakes. Borrowing freely from published sources, they have specific information on earthquake risk in Las Vegas Valley and how to mitigate risk and be prepared.

### Structural Analysis of the New Washoe Medical Center Tower

- Kirk Ellis and Dan Riebli, with Kirk Ellis and Associates, reported on their company's structural analysis of the new 12-story tower (and basement) that Washoe Medical Center is adding at their facility in Reno. Their company was asked to check the plans presented by the structural engineering firm that designed the building. The computer model predicts 9 inches of displacement on the top floor during the maximum considered earthquake for this site. The design exceeds the criteria in the International Building Code 2005, and the building should be able to be occupied immediately after the expected earthquake.

PROJECTS: The Council discussed and set priorities for funding of 4 project proposals totaling \$66,366.00 for possible FEMA federal fiscal 2005 year-end funding. (\$30,296 requested with \$36,070 matching funds)

- Seismic Risk Assessment of the Las Vegas Infrastructure (proposed by UNLV – Ronald Sack, Department of Civil & Environmental Engineering); cost to DEM = \$19,796; matching funds = \$24,570; total cost = \$44,366.
- Earthquake Safety Classes for Local Government Employees (proposed by Washoe County Emergency Management); cost to DEM = \$2,500; matching funds = \$2,500; total cost = \$5,000. (This is contingent on Washoe County's agreeing to cover the matching funds.)
- ATC-20 Post-Earthquake Safety Evaluation of Buildings – Training Seminar (proposed by ASCE-Truckee Meadows Branch); cost to DEM = \$3,500; matching funds = \$3,500; total cost = \$7,000.
- How to Build and Use a Seismometer: An Education Module (proposed by UNR – Sherif Elfes, Gary Norris, and Ellen Jacobson); cost to DEM = \$4,500; matching funds = \$5,500; total cost = \$10,000.

In summary, the Nevada Earthquake Safety Council has provided a successful venue for science, research, and information on Nevada's Earthquake Hazards to be promulgated in legislature, provided to business and industry, and delivered to the citizens of Nevada. Additional information and details of these accomplishments are noted in the minutes of the quarterly meetings. The many contributors to this outstanding effort are recognized in the minutes, and it is important to note that it does indeed take many contributors, individually and in concert with one or more committees, to achieve the goal of Earthquake Safety in Nevada.