

Summary Minutes

Nevada Earthquake Safety Council

4 May 2005

The Nevada Earthquake Safety Council (NESC) met from 9:30 a.m. to 3:10 p.m. at the Sierra Pacific Power Company offices in Reno. These and previous minutes are posted on the NESC Web site (www.nbmng.unr.edu/nesc).

Ron Lynn chaired the meeting. Individuals attending the meeting are members of the Council:

John Anderson*, Nevada Seismological Laboratory
 Ed Atwell, University of Nevada, Reno
 Alan Bennett*, Plans Examiner with the City of Reno
 Mike Blakely*, Blakely, Johnson, and Ghusn
 Ian Buckle*, UNR Center for Civil Engineering Earthquake Research
 Bob Cullins, University of Nevada, Reno
 Craig dePolo, Nevada Bureau of Mines and Geology, who held the proxy for
 Diane dePolo, Nevada Seismological Laboratory, who held the proxy for
 Jenelle Hopkins*, Clark County School District, Las Vegas
 Sam Earman, Desert Research Institute
 Greg Flanigan*, Farmers Insurance
 Terri Garside, Nevada Bureau of Mines and Geology
 Mark Harris, Nevada Public Utilities Commission
 Werner Hellmer, Clark County Department of Development Services, Building Department
 Debbie Hinman, SBC
 Eric Hubbard, Kleinfelder
 Gloria Leggio, Las Vegas Academy (Clark County School District)
 Ron Lynn*, Clark County Building Department
 Cathy Ludwig, Washoe County Emergency Management
 Rick Martin, Nevada Division of Emergency Management
 Greg Moss*, The Moss Group
 Glade Myler, Office of the Attorney General
 Jim O'Donnell*, UNLV
 Russ Pedersen, Washoe County Sheriff's Office, Search and Rescue
 Jon Price*, Nevada Bureau of Mines and Geology
 Jim Reagan*, Sierra Pacific Power Company
 Burt Slemmons*, University of Nevada, Reno (retired, Las Vegas consultant)
 Ken Smith, Nevada Seismological Laboratory
 Catherine Snelson*, UNLV Geoscience Department
 Jim Werle*, Converse Consultants
 Ann Wiswell, who held the proxy for
 Wayne Carlson*, Nevada Public Agency Insurance Pool

* indicates member of the Board of Directors.

A quorum of directors (the necessary 11) was present.

Board Members unable to attend or send a proxy included:

Bernie Anderson*, Nevada State Assemblyman

Warren Hardy*, Nevada State Senator
 Michael Lynch*, Builders Association of Northern Nevada
 Marge Gunn Nutman*, Nevada Association of Counties & Lincoln County Office of Emergency
 Management
 Ed Ruttan*, American Red Cross

The minutes from the meeting on 16 February 2005 were approved. A correction should indicate that Bob Cullins now works with UNR.

Ron Lynn thanked Jim Reagan and Sierra Pacific for hosting the meeting.

COMMITTEE REPORTS

Awareness and Education Committee

Diane dePolo reported that the Committee sent announcements for the poster contest associated with the Earthquake Awareness Week (February 28 to March 5, 2005) to approximately 650 Nevada schools. The Council voted on the top posters for the contest.

Diane stated that Jenelle Hopkins, who is on leave from the Clark County School District as an Albert Einstein Distinguished Education Fellow at the National Science Foundation, needs help with the earthquake training for teachers associated with the annual meeting of the Association of Engineering Geologists on Saturday, September 24 in Las Vegas.

ACTION ITEM: Volunteers interested in helping with the earthquake training for teachers on September 24 in Las Vegas should contact Jenelle Hopkins at jhopkins@nsf.gov or at 703-292-8474.

SBC is having a safety fair on Thursday, June 9, at their facility on Vasser Street in Reno. Please contact Debbin Hinman at SBC for more information.

The Committee received and ranked three proposals for year-end funding (see item later in the minutes).

Research Committee

Craig dePolo stated that the Council has produced “Beat the Quake” refrigerator magnets for distribution to the general public.

Craig called to everyone’s attention a new book on “Earthquakes in Human History” by Jelle Zeilinga de Boer and Donald Theodore Sanders (278 pages, published in 2005 by Princeton University Press). Jim Werle discussed the book “Earth Beneath Our Feet,” which investigates earthquake premonitions.

Jim Werle reminded everyone about the upcoming annual meeting of AEG (September 21-23, 2005), at which Craig dePolo is organizing a symposium on earthquake hazards in the Las Vegas area. It will be an update of the 1996 conference that NESC sponsored.

Jon Price noted that the 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. They use the same model for probabilistic seismic hazard analysis that feeds into the National Earthquake Hazards Reduction Program

(NEHRP) provisions used in model building codes. Unlike the code maps, which show probabilities of exceeding a particular ground acceleration during a particular period of time, information that is useful to structural engineers in designing buildings and other structures, the new maps present probabilities in an easy-to-understand manner. Dick Meeuwig, 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.

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." Copies of this map are available for free downloading over the Web at the NESC and Nevada Bureau of Mines and Geology Web sites. Poster-sized hard copies are available for sale at the Nevada Bureau of Mines and Geology (www.nbmng.unr.edu or 775-784-6691 extension 2).

Policy Recommendations Committee

Ann Wiswell made a presentation on Rural Water System Earthquake Preparedness. She encouraged input from the Council.

Many of the general improvement districts are members of the Nevada Public Agency Insurance Pool. The sorts of effects on water systems to expect from earthquakes are 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. Both structural and non-structural damage can be expected. Preventable non-structural damage may include fires caused by improperly braced gas lines and chemical spills.

Jim Reagan noted that the American Water Works Association may have programs that could support these efforts of the Nevada Public Agency Insurance Pool. Mike Blakely offered to provide some specific recommendations for mitigation efforts, including how to protect against chemical spills.

Mark Harris noted that the Nevada Public Utilities Commission has examples of slides that could be used in the presentation. Craig dePolo suggested that the new earthquake probability maps of the U.S. Geological Survey will be helpful slides in presentations to individual counties and general improvement districts.

Jim Werle noted that the Nevada Water Resources Association (NWRA) may be able to help the Nevada Rural Water Association with training courses, for which the operators of the rural water systems could get continuing education units, which are needed for their recertification. Jim suggested that Ann get in touch with Donna Bloom of NWRA.

Strategic Planning Committee

The Council approved the annual report of activities for plan year 2004, as prepared by the Strategic Planning Committee, on the agenda. Ron Lynn thanked Jim Reagan for his hard work in preparing the report.

Ad Hoc Committee on Rockery Walls

Werner Hellmer reported that he has had considerable input from interested parties in Northern Nevada on the draft guidelines on the construction of rockery walls. The latest version of the draft guidelines are posted on the NESC Web site. A few adjustments need to be made before presenting the guidelines for adoption.

Mike Blakely questioned whether the NESC should be the body to endorse design procedures such as those outlined in these guidelines. He stated that such design procedures should be included in building codes. He does not see a clear methodology where seismic concerns are taken into account in specific wall design. The code says that masonry is to be reinforced, but rockery walls are basically gravity systems without reinforcements. Mike believes that they will likely perform poorly during earthquakes. Ian Buckle echoed Mike's concerns and stated that ultimately dealing with rockery walls should be handled in adopted building codes.

Werner responded that the guidelines are not a prescriptive standard but are more a guideline for building officials and engineers. Ron Lynn stated that the Nevada Association of Building Officials requested that the NESC look at this issue, because there is considerable variation among communities in the way they deal with rockery walls. His major concern is that these walls are being built today, sometimes too close to houses. Ron further stated that, unfortunately, rockery walls qualify for "green building credits," which will make it difficult to eliminate their use.

Glade Myler asked whether NESC has immunity with regard to use of such guidelines. To avoid such problems, he suggests that there should be a disclaimer that the statements are simply a guideline and not code or law.

Alan Bennett stated that the City of Reno has seen some serious problems with rockery walls, including deterioration of the rocks themselves. Eric Hubbard noted that most geotechnical engineers believe that rockery walls will not perform well during earthquakes.

Mike Blakely suggested that design criteria be such that the walls withstand a certain probable earthquake. This may eliminate their use, unless an engineering analysis is able to demonstrate that the walls will perform as needed.

Please submit comments on the guidelines to Werner Hellmer (wkh@co.clark.nv.us; 702-455-8095).

ACTION ITEM: Werner Hellmer will work with Mike Blakely to continue to evaluate the guidelines. They will seek input from the local chapters of the American Society of Civil Engineers and other appropriate organizations (e.g., American Society of Foundation Engineers and the California Geotechnical Engineers Association).

DEM UPDATE

Glade Myler reported that the Department of Homeland Security is in the process of allocating funds to individual states.

DEM is working on an emergency response mutual assistance compact for all the counties and cities in the state. This will guarantee that Nevada does not see a reduction in Homeland Security funds.

There is also a mutual assistance agreement in the works with the California Office of Emergency Management and Nevada counties that border California.

Bob Cullens noted that the language drafted for the mutual assistance compact is well written, particularly in covering issues of financial liability.

UPDATE OF ACTIVITIES AT THE EARTHQUAKE ENGINEERING LABORATORY AT THE UNIVERSITY OF NEVADA, RENO

Ian Buckle discussed the Center for Civil Engineering Earthquake Research in the Department of Civil and Environmental Engineering. The Center was established in 1981 with a focus on bridges. Before the recent shake tables were acquired, the Center built expertise in field testing (“quick release testing” at full scale). Although the Center still puts much of its emphasis on bridges, it also deals with other engineered systems, including structures and nonstructural components (such as piping systems). The work ultimately contributes to design aids, manuals, and specifications in building codes. The Center does a lot of work for the Nevada Department of Transportation and Caltrans. One of the Caltrans projects included contributions to the design of the new bridge from Oakland to San Francisco.

The Center has a large-scale structures laboratory (LSSL), which includes several shake tables, a geotechnical laboratory, and a virtual bridge-information center. UNR is one of fifteen universities that are part of the George E. Brown, Jr. Network Earthquake Engineering Simulation (NEES). The LSSL has received two “small group grants” from the National Science Foundation’s NEES program. One of the experiments was on a two-span, 135-ton, 70-foot-long bridge shaken to failure on three shake tables.

The Center is also involved with educational programs for high-school-level students.

The laboratory would like to expand (to the east, toward Evans Street) to include more experimental space and an auditorium for education and outreach activities. As a research facility, funding for the expansion is expected to come from non-State, mostly Federal sources.

Nevada Hazard Mitigation Planning Committee

Ron Lynn reported that the Proposal Review Subcommittee of the Nevada Hazard Mitigation Planning Committee will meet immediately after this meeting, but the full committee will next meet on August 4, the day after the NESC meeting. Funding for the full Committee is in question. Minutes of the last meeting are posted on the Web.

Update on Recent Earthquakes

John Anderson reported on three topics that were discussed at the annual meeting of the Seismological Society of America, which was hosted by the Nevada Seismological Laboratory the previous week at Incline Village.

(1) Earthquake probability maps. See also the earlier discussion under the report of the Research Committee. John showed comparisons between the metropolitan areas of Los Angeles, Reno-Sparks-Carson City, and Las Vegas. The hazards for southern portions of Los Angeles (i.e. Palos Verdes through coastal Orange County) and Reno are similar, while the hazards in the Las Vegas area are shown to be lower. John noted that when new values of earthquake recurrences and magnitudes on faults near Lake Tahoe are added to the next version of the U.S. Geological Survey’s probabilistic seismic hazard analysis, the hazard shown on these maps in the Reno area will likely increase.

(2) New information on earthquakes at the north end of Lake Tahoe. John summarized earlier work on the August-January 2003 swarm of earthquakes, which was reported in *Science* magazine in August 2004 and, along with geodetic motion of Slide Mountain, supported a hypothesis of injection of a magmatic dike deep in the Earth’s crust (at depths of 25 to 30 kilometers). Since that swarm, Ken Smith has noted that there has been a swarm of shallow earthquakes in this region. Most of the more recent earthquakes are between 8 and 16 kilometers deep. The focal mechanisms are right-lateral strike slip on N15°W-striking, steeply dipping (80°E) structure parallel to the West Tahoe Fault. The exact cause of these shallow earthquakes is unknown; it may be related to stress transfer from the deeper earthquakes in 2003, fluid injection (gases or water) causing a decrease in effective stress, or hydrofracturing (fractures caused by water injected into the rock mass at high pressure). Ken noted that the U.S. Geological Survey is monitoring helium isotopes in warm

springs in this area to see if there is a signature related to degassing from the Earth's mantle, the likely source of the dike.

(3) Community involvement on the road to school seismic safety in British Columbia. John discussed a presentation by Dr. Tracy Monk, a family physician, who in 2003 formed an organization called "Families for School Seismic Safety." The Nevada Seismological Laboratory has provided a copy of her PowerPoint presentation on line (<http://quake.seismo.unr.edu/htdocs/academic/ANDERSON/Papers/SSA2005/MONK.ppt>). The organization successfully lobbied the government of British Columbia to commit \$1.5 billion to improve seismic safety in schools. She noted that schools appear to be disproportionately at risk. Their Web site is www.fsssbc.org. Their success was in demonstrating short-term political gain for the politicians who supported the effort. She viewed the issue as one of public health, not just a safety issue.

Discussion and Voting on the Proposals Received for Possible Year-End Funding

The Council received four proposals for possible year-end funding from the Division of Emergency Management, three through the Education Committee and one through the Research Committee. All were considered worthy. The Council voted on priorities for funding as follows, with (1) being the highest priority.

1. 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.
2. 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.)
3. 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.
4. 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.

ACTION ITEM: Jon Price will report these priorities in a request to Frank Siracusa, Chief of DEM. He will add the necessary UNR indirect costs for those projects that do not contain this charge for UNR's managing the funds.

International Code Council (ICC) Involvement with New Seismic Initiatives

Ron Lynn has suggested that the ICC support an earthquake symposium at the 2006 Western States Seismic Safety Commission meeting. The 2006 codes, which theoretically will be adopted by all jurisdictions in Nevada, will be voted upon in September of 2005.

University of Nevada, Reno's Tabletop Earthquake Exercise

Ed Atwell, UNR's Emergency Manager, discussed the earthquake exercise that the University held on February 1, 2005. UNR has recently upgraded its emergency operations center (EOC), including laptop computers, satellite phones, and radios. One of the innovative approaches in the recent exercise was to send section chiefs pre-exercise alerts beginning about a week ahead of time. The exercise involved two shifts of employees. There has been considerable feedback on the exercise; it was the best exercise that the University has conducted to date.

Communications were identified as needing further attention. The University used 800 MHz radios, ham radios, and telephones in the exercise. They realize that without telephones, they would have trouble. They have satellite telephones, ham radios, and packet-communication capabilities for reaching the State EOC.

Another concern was the computer system used during the exercise. The current system, including the process for filling out forms, is a bit cumbersome. They are moving toward a Web-based EOC system. Jim Reagan noted that Sierra Pacific is trying to get the same Web-based system that Washoe County and the local cities are using.

The University could also benefit from further consideration of the messages that need to go to students, parents, faculty, and others on such issues as whether to stay home or come to campus.

The UNR EOC has backup power generators and systems to provide continuous power. The University has a system for wireless computer connections, and the UNR Police Department has computers in each patrol car.

Old Business

Ron Lynn reviewed action items from the last meeting.

ACTION ITEM: Jon Price will see that the poster for the Council used at the Seismological Society of America meeting also be used at the upcoming meeting of the Association of Engineering Geologists in Las Vegas.

New Business

May 8-14 is Building Safety Week. There will be three exhibit booths throughout Las Vegas Valley during that week. Ron Lynn will see that the NESC "Beat the Quake" magnets are distributed at these booths.

Ron Lynn will be the luncheon speaker at the upcoming Building Seismic Safety Council meeting in Las Vegas.

The California Buildings Standards Commission has voted to recommend adoption of the International Code Council's set of model building codes. This is a key step in acceptance of the codes throughout the country.

The annual meeting of the Western States Seismic Policy Council (WSSPC) will be September 11-14, 2004 in Boise, Idaho. Please see <http://www.wsspc.org/Events/ac2005/index.htm> for details about the meeting. Ron Lynn called for volunteers on WSSPC's Committee on Engineering Construction, and Building Codes.

A conference to commemorate the 100th anniversary of the 1906 San Francisco earthquake will be held April 18-22, 2006 in San Francisco. This will be a joint conference of the Earthquake Engineering Research Institute (EERI), the Seismological Society of America, and the California Office of Emergency Services.

The Council discussed how the Nevada Earthquake Safety Council should prepare for the 2006 event. Ron Lynn charged the Council's '06 Committee with preparing for this event. John Anderson and Craig dePolo volunteered to co-chair the committee. Other volunteers for the committee included Greg Flanigan, Mike Blakely, Cathy Snelson, Werner Hellmer, Terri Garside, Diane DePolo, Glorio Leggio, Jim O'Donnell, and Ron Lynn.

ACTION ITEM: The '06 Committee (co-chaired by John Anderson and Craig dePolo) will report at upcoming NESC meetings on its progress regarding a Nevada response to the commemoration of the 1906 earthquake in San Francisco.

ACTION ITEM: At Alan Bennett's suggestion, Terri Garside will contact Kirk Ellis to ask him to make a presentation to the Council on November 9 on the computer model his company used in designing the new 12-story tower at Washoe Medical Center.

Public Comments

Bob Cullins reported that the Chemistry Department at UNR has ordered 20 storage cabinets for chemicals; he has advised that they be properly braced to the floors and walls.

Announcement of Future Meetings

Future NESC meetings are as follows:

Wednesday, August 3, 2005 (Las Vegas)

Wednesday, November 9, 2005 (Reno).

REVIEW OF ACTION ITEMS

Volunteers interested in helping with the earthquake training for teachers on September 24 in Las Vegas should contact Jenelle Hopkins at jhopkins@nsf.gov or at 703-292-8474.

Werner Hellmer will work with Mike Blakely to continue to evaluate the guidelines. They will seek input from the local chapters of the American Society of Civil Engineers and other appropriate organizations (e.g., American Society of Foundation Engineers and the California Geotechnical Engineers Association).

Jon Price will report the Council's priorities for year-end funding in a request to Frank Siracusa, Chief of DEM.

Jon Price will see that the poster for the Council used at the Seismological Society of America meeting also be used at the upcoming meeting of the Association of Engineering Geologists in Las Vegas.

The Council's '06 Committee (co-chaired by John Anderson and Craig dePolo) will report at upcoming NESC meetings on its progress regarding a Nevada response to the commemoration of the 1906 earthquake in San Francisco.

Terri Garside will contact Kirk Ellis to ask him to make a presentation to the Council on November 9 on the computer model his company used in designing the new 12-story tower at Washoe Medical Center.

respectfully submitted by Jon Price, 12 May 2005

Nevada Earthquake Safety Council
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NEVADA EARTHQUAKE SAFETY COUNCIL
Members of the Board of Directors and Officers
(as of 22 February 2005)

Business and Industry, Southern Nevada	vacant
Business and Industry, Northern Nevada	Nevada Resort Association Michael Lynch Builders Association of Northern Nevada
Insurance Industry (statewide)	Greg Flanigan Farmers Insurance (Las Vegas)
State Government (statewide)	Mark Harris Public Utilities Commission (Carson City)
Local Government, City	Wayne Carlson Nevada Public Agency Insurance Pool (Carson City)
Local Government, County	Marge Gunn Nutman Nevada Assoc. of Counties & Lincoln Co. Office of EM
Seismology (statewide)	John Anderson Nevada Seismological Laboratory (UNR)
Geosciences, Southern Nevada	Burt Slemmons Las Vegas consultant, UNR (retired)
Geosciences, Northern Nevada	Jonathan G. Price Nevada Bureau of Mines and Geology
Engineering, Southern Nevada	Jim Werle Converse Consultants
Engineering, Northern Nevada	Mike Blakely Structural Engineers Association of NV
Education (statewide)	Jenelle Hopkins Clark County School District, Las Vegas
Community Organizations, Southern Nevada	Ed Ruttan American Red Cross
Community Organizations, Northern Nevada	Jim Reagan Sierra Pacific Power Company
University, Southern Nevada	Catherine Snelson UNLV Geoscience Department
University, Northern Nevada	Ian Buckle UNR Center for Civil Engineering Earthquake Research
Building Official, Southern Nevada	Ronald L. Lynn Clark County Building Department
Building Official, Northern Nevada	Alan Bennett City of Reno
State Senate	Warren Hardy Nevada State Senator (Las Vegas)
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Member at Large, Southern Nevada	Jim O'Donnell UNLV
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