

Summary Minutes

Nevada Earthquake Safety Council

3 August 2005

The Nevada Earthquake Safety Council (NESC) met from 9:00 a.m. to 2:30 p.m. at the Clark County Department of Building's Russell/Cameron Office in Las Vegas. These and previous minutes are posted on the NESC Web site (www.nbmg.unr.edu/nesc).

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

Elizabeth Ashby, Nevada Division of Emergency Management
 Alan Bennett*, Plans Examiner with the City of Reno
 Mike Blakely*, Blakely, Johnson, and Ghusn, who also held the proxy for
 Ian Buckle*, UNR Center for Civil Engineering Earthquake Research
 Wayne Carlson*, Nevada Public Agency Insurance Pool
 Craig dePolo, Nevada Bureau of Mines and Geology, who held the proxy for
 Michael Lynch*, Builders Association of Northern Nevada
 Diane dePolo, Nevada Seismological Laboratory, who held the proxy for
 Jenelle Hopkins*, Clark County School District, Las Vegas, and for
 John Anderson*, Nevada Seismological Laboratory
 Theodore Droessler, Manager of Engineering, Building Division, Clark County Department of
 Development Services
 Greg Flanigan*, Farmers Insurance
 Terri Garside, Nevada Bureau of Mines and Geology
 Marge Gunn Nutman*, Nevada Association of Counties & Lincoln County Office of Emergency
 Management
 Warren Hardy*, Nevada State Senator
 Mark Harris, Nevada Public Utilities Commission
 Werner Hellmer, Clark County Department of Development Services, Building Department
 Bruce Hurley, National Nuclear Security Administration/Nevada State Office
 John Hymas, Hirschi Masonry, Las Vegas
 John Kubota, Structural Engineer, Kubota & Associates, Las Vegas
 Gloria Leggio, Las Vegas Academy (Clark County School District)
 Ron Lynn*, Clark County Building Department
 Rick Martin, Nevada Division of Emergency Management
 Greg Moss*, The Moss Group
 Glade Myler, Office of the Attorney General
 Elton Nutman, Lincoln County citizen
 Dan O'Brien, State Public Works Board
 Jim O'Donnell*, UNLV
 Kevin Parsons, President, Parsons Brothers Rock Retaining Walls, Henderson
 Jon Price*, Nevada Bureau of Mines and Geology
 Jim Reagan*, Sierra Pacific Power Company and Nevada Power Company
 M. David Rowe, PE, Special Structures Division Director, Wright Engineers, Las Vegas
 Patrick Rush, State of Nevada Employees Association
 Ed Ruttan*, American Red Cross
 Burt Slemmons*, University of Nevada, Reno (retired, Las Vegas consultant)
 Connie Suckling, Senior Government Relations Specialist, Southern Nevada Homebuilders Association
 Jim Werle*, Converse Consultants

* indicates member of the Board of Directors.

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

Glade Myler stated that, according to State law, unless proxies are allowed for a specific commission or council by the Legislature, proxies are not actually allowed. Proxy voting is therefore not to be used for the Council.

Board Members unable to attend or send a representative included:

Bernie Anderson*, Nevada State Assemblyman
Catherine Snelson*, UNLV Geoscience Department

The minutes from the meeting on 4 May 2005 were approved.

COMMITTEE REPORTS

Ad Hoc Committee on Rockery Walls

Werner Hellmer opened the discussion about guidelines for construction of rockery walls. He stated that the building code does not cover such retaining walls well and that some guidelines for their construction are needed. Some individuals feel that the Council is not the appropriate place for adoption of these guidelines. Mike Blakely maintains that rockery walls are unreinforced masonry (URM), and as such are not allowed by building codes in earthquake-prone areas, but Werner Hellmer argues that they are not URMs, because they are not actual buildings. Mike argued that before guidelines for construction would be adopted into codes, rigorous engineering evaluation would need to be done.

In an e-mail, Gary Norris, Professor of Civil Engineering at UNR, commented that “there is no dynamic analysis of these walls that I know of. They should be studied along the lines of Newmark’s sliding block analysis before NV EQ Safety Council makes any recommendation whatsoever.” Dan O’Brien agreed that there need to be some engineering design criteria for such walls. Ron Lynn stated that the proposed guidelines are not prescriptive standards.

John Koboto described how the industry, particularly Parsons Brothers Rock Retaining Walls, builds these structures. They use principles of mechanics and friction. Kevin Parsons explained that rockery walls did not fail in the Seattle-Olympia, Washington area during the magnitude 6.8 Nisqually earthquake a few years ago, although the earthquake caused approximately \$1 billion in overall damage. John Koboto reported that pressure of mud built up behind rockery walls after a rain and erosion from flash floods tend to be the causes of failures of these structures.

Mr. Parsons has been building rockery walls in Reno since 1989 and in Las Vegas since 1996. He estimates that about 10 million square feet of rockery walls have been built in Nevada. He anticipates that this number could double in five years, and Werner Hellmer feels that the number could triple in five years, given the price of land and demand for space for buildings in the Las Vegas area. Ron Lynn noted that new residents are moving to Las Vegas at a rate of nine to ten per hour.

Ron Lynn suggested that guidelines for construction of rockery walls be adopted as part of the code. Building officials need such guidelines to help them evaluate designs of the walls.

ACTION ITEM: Mike Blakely and John Kubota will work with Werner Hellmer to further investigate necessary steps to develop guidelines for the construction of rockery walls that could be adopted as part of the building code. They will also reevaluate the role of the Council in this process.

Awareness and Education Committee

Diane dePolo reported that Jenelle Hopkins is still looking for volunteers to help her with the workshop associated with the Association of Engineering Geologists (AEG) annual meeting in Las Vegas on Saturday, September 24. Please contact Jenelle (at jhopkins@nsf.gov or 703-292-8474) if you can help.

The Committee discussed ways to enhance Earthquake Awareness Week. Suggestions are welcome. Ideas that have been discussed include (1) for small children – coloring books or sheets showing earthquake mitigation around the house and school; (2) for older children – helping with mitigation projects around the home or school to earn an “Earthquake Mitigation Ranger” badge; (3) for schools or businesses – earning an “Earthquake Mitigation Certificate” for developing a plan, taking a nonstructural mitigation survey, and completing at least one nonstructural fix. Businesses could get a “silver star” by sponsoring or helping another school or business complete nonstructural mitigation.

Glade Myler suggested that scout badges (Boy Scout and Girl Scout) could be earned for mitigation projects.

Research Committee

Craig dePolo spoke about recommendations and ideas coming from the 2004 non-structural mitigation workshop. He is distilling these recommendations, some of which are feeding into ideas for Earthquake Awareness Week. Wayne Carlson suggested tying mitigation projects into the Nevada School Seismograph Network.

Craig noted that the fault-mapping project proposed for the pre-disaster mitigation grants program of FEMA was not funded. The overall cost of the project over a nine-year timeframe is approximately \$4 million. This project still needs to be done and is a high priority in the State’s earthquake mitigation plan. Ideas for funding are welcome.

Craig is working on a map of Quaternary faults in Nevada. He is updating the work of the U.S. Geological Survey (available on the Web through www.usgs.gov). He anticipates that the map will go to review in about one month and may be available at the November Council meeting.

ACTION ITEM: On behalf of the Council, Ron Lynn, with help from Craig dePolo and Jim Reagan, will write a letter to Frank Siracusa, expressing concern about the plan to remove most of the C-130 airplanes from the Nevada Air National Guard. These planes may be critical for emergency response after a major event, such as an earthquake that is likely to occur in urban areas in Nevada. A copy of the letter should be sent to Congressman Jim Gibbons.

ACTION ITEM: Warren Hardy will also write a letter concerning the plan to remove the C-130s. Ron Lynn will send a copy of his letter to Warren.

The AEG annual meeting will be held September 17-25, 2005 in Las Vegas. In addition to field trips before and after the meeting, there will be technical sessions on seismic hazards in the Las Vegas area and on how to identify and map faults in the desert Southwest. You can register on line at www.aegweb.org.

Ad Hoc Committee on the 1906 San Francisco Earthquake

Craig dePolo is working on an abstract for the 100th anniversary commemoration of the April 18, 1906 San Francisco earthquake regarding the impact that the earthquake had on Nevada. This will be presented at the Seismological Society of America’s annual meeting in San Francisco in April of next year.

Policy Recommendations Committee

Wayne Carlson reported that a presentation on non-structural mitigation is being put together for use in rural counties.

Strategic Planning Committee

The Committee did not meet during the last quarter.

ACTION ITEM: Members of the Council should review the Strategic Plan on the NESC Web site and submit comments to Jim Reagan.

DEM UPDATE

Rick Martin reported that the State received about \$38 million in the last year in funds from the Department of Homeland Security. He anticipates more funding in the next year as the Department is recognizing the transient population of tourists in addition to permanent residents.

The DEM Web site (dem.state.nv.us) includes opportunities for training and grants. FEMA is offering several earthquake-related classes in the next year.

There may be some carryover funds of approximately \$44,000; Rick will work on getting some of those dollars to cover priorities set during the May meeting of the Council.

One of the three proposals submitted by the State of Nevada for FEMA's Pre-Disaster Mitigation grant program has been awarded – for updating HAZUS in Nevada.

STRATEGIC PLANNING OF THE NEVADA EARTHQUAKE SAFETY COUNCIL

Craig dePolo led an initial discussion of the Nevada Earthquake Risk Mitigation Plan – reviewing what has been accomplished and looking at future needs. Much progress has been made on several elements of the plan. Craig will collate comments as the starting point for updating this plan. He will add narrative statements about the progress made so far on goals.

Unfortunately there has not been enough funding to stay ahead of urban growth with mapping of earthquake hazards.

ACTION ITEM: Greg Moss will suggest a policy for consideration by Nevada building officials (through Ron Lynn) that they require developers (or their contractors) to identify and map active faults in development plans submitted for approval.

ACTION ITEM: Jon Price will suggest a process for additional funding of the Advanced National Seismic System through the U.S. Geological Survey to pick up long-term maintenance of seismic stations that will be installed over the next couple of years by the EarthScope program of the National Science Foundation. Jon will work with John Anderson and the USGS to determine how many of EarthScope's transportable array instruments would be needed to adequately characterize earthquakes in rural areas of Nevada.

ACTION ITEM: Ron Lynn requested that Ron Hess produce a document on how to interpret results of HAZUS – a "HAZUS for Dummies" booklet. This could accompany the report that Ron is preparing showing the results of HAZUS runs for likely earthquakes near each county seat.

ACTION ITEM: Terri Garside will place continuation of the discussion of the Nevada Earthquake Risk Mitigation Plan on the agenda for the November meeting.

FEMA UPDATE

Terri Garside reported from conversations with Jeff Lusk that FEMA will have more or less independent status within the Department of Homeland Security. The annual block grants for emergency management may move back into FEMA's control from the Department level.

FEMA's earthquake program managers meeting, at which Craig dePolo will be representing Nevada, will have 30 participants from states. The meeting will be in two weeks, and Craig will report to the Council on any significant findings and developments.

Jeff Lusk is trying to get additional hand-me-down computers, no longer needed by FEMA, donated to the Nevada seismometers in schools program run by the Nevada Seismological Laboratory. Jeff will work with Ken Smith on this.

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. It has a sloping floor, with about 6 inches of deflection within a 20-foot distance. Some people were concerned about their health (in dealing with annoyance of uneven floors). Along with other concerns about the building, the State Public Works Board investigated the costs of fixing the building and commissioned a study by Blakely, Johnson, and Ghush. The bottom-line cost would be about \$9 million to \$12 million to fix the problems and bring the building up to modern code. In the 2005 capital improvement proposal to the Legislature, the State Public Works Board and the Governor recommended building a new, replacement building, but the Legislature removed this item from the capital improvements program for this biennium. Using a lease-purchase program, the immediate cost for the State would be \$20 million for a \$40 million building; the remaining cost would be financed over a 30-year period. The Governor will likely recommend that a replacement building be included in the 2007 capital improvement program. The State Public Works Board is looking into costs for relocating the occupants in the meantime.

Mike Blakely discussed the technical aspects of his firm's structural report, which focused on the deflections of the floor, seismic strength, and implications of concrete that had fallen off the building. It is a six-story reinforced concrete building with a two-way post-tensional flat slab floors with a perimeter ductile concrete frame. The flat slab bays are large—typically 40x40-feet. The building is supported on piles, because of loose sand below and the potential liquefaction. The building was built according to the 1973 code. Deflections ranged from 4 to 6.2 inches in the middle of the 40x40-foot bays; this is more than should have been expected. This makes the rooms unserviceable and uncomfortable for the employees. Files lean, bookcases tilt, and people notice that they are walking on a sloping floor. In addition, a couple of chunks of concrete have fallen off, heightening the concern of the occupants.

The report finds that there are two problems with the building—(1) large floor deflections and (2) an increase in seismic provisions in building codes over the years since the building was constructed.

The large deflections probably are the result of two construction errors. (1) The post tensioning achieved may be only about half that intended by the design. This may be due to stressing to load but without achieving the necessary elongation. (2) Concrete strengths indicated by actual cores are 2,010 to 3,530 psi versus the 4,000 psi specified. Both items increase deflection and reduce the vertical load capacity of the floor. Adding leveling compounds would increase the load and deflection and increase the seismic design mass.

In 1986, an attempt to mitigate the deflection added steel columns near midspans but this did not seem to do anything other than add some redundancy to the system. All the floors deflected together and depressed the slab on grade.

Seismic provisions in the building code have increased the magnitude of design loads required and enhanced the ductility provisions. The original building was designed under the 1973 Uniform Building Code for about

4% of the acceleration due to gravity (g) as a lateral load. The 2003 International Building Code now requires the same building to be designed for about 8% g as a lateral load. Increasing the mass of the building, which would have to be done in any retrofit to deal with the sloping floors, would increase the loads on an existing sub-standard system.

The chunks of concrete that have fallen appear to be the result of the deflections; the areas from which they come should be monitored.

The report offered several alternatives to fixing the problems; repair schemes range in cost from 75 to 90% of the cost of a new building (estimated to be at least \$16 million for the same size of building, excluding costs of disruption and moving people in and out of the building).

The Kinkead Building is expected to survive a major earthquake such that the occupants will be able to safely exit. The report does not categorize the building as a dangerous building. The deflection of the floor actually enhances the overall strength of the building.

Mike offered his perspective as a citizen and member of the Council. He referred to the ongoing first-tier rapid evaluation of buildings on the UNR campus as an example of what ought to be done for all State buildings and for privately owned businesses. The State and other businesses should review all their buildings and set priorities for continued use, repair or strengthening as needed, and phasing out of those buildings that are not economical to repair or that are not historically significant. Mike believes that from an earthquake safety perspective, we need to put the Kinkead Building in the context of other buildings in the community. The Kinkead Building is a relatively modern building designed for about 4% g. What about the URM buildings in Carson City that the State and others own? The Carson City Mint (now the State Museum) is a URM that was strengthened to meet the requirements of the UCCB and that code requires much less in strength than a 4% ductile concrete frame. The old Court House and Post Office (now the State Archives) is an 1891 URM with several strengthening and life safety improvements, but the Kinkead building should perform much better in a strong earthquake than this old building. One of the goals of the Council should be to promote an overall evaluation of buildings, particularly public-owned buildings.

UPDATE ON RECENT EARTHQUAKES

Diane dePolo discussed the June 26, 2005 North Tahoe area earthquake. It was a magnitude 4.9 earthquake just over the State line in California, about 20 miles from Truckee, at a depth of 15 kilometers. It was widely felt in western Nevada and eastern California. Over 5,400 people put their observations into the USGS's Community Internet Intensity ("Did You Feel It?") Map. Maximum intensities were at Mercalli Intensity V, in and around Truckee, and intensities are consistent with expectations based on the magnitude. The USGS's ShakeMap was generated and posted automatically in about 10 minutes after the earthquake. Little damage was reported, although a car did run into a boulder that fell onto the road in the Truckee Canyon as a result of the earthquake.

The Nevada Seismological Laboratory and the USGS are working to integrate Nevada, California, and USGS National Strong Motion Program data automatically, to automate delivery of UNR data to the California Integrated Seismic Network, and to improve regional coverage of accelerographs.

WESTERN STATES SEISMIC POLICY COUNCIL

Jon Price announced that the Western States Seismic Policy Council (WSSPC) will have its annual meeting September 11-14 in Boise, Idaho. Please see www.wsspc.org for registration information. The WSSPC Board of Directors will be considering four policy recommendations. These deal with (1) improving tsunami warning, preparedness, and mitigation procedures for distant and local sources; (2) the definition of active faults in the Basin and Range province; (3) real-time earthquake-monitoring networks; and (4) adoption of an gubernatorial executive order for earthquake safety of existing State-owned buildings. The first three are revisions of earlier WSSPC policy recommendations, and the fourth is new.

Ron Lynn added that he will be representing the Nevada Earthquake Safety Council and International Code Council at the WSSPC meeting. He will be bringing the following issues to WSSPC for consideration: (1) a joint publication dealing with use of the International Building Code for seismic design; (2) a partnership on a seismic symposium in 2006; and (3) collaboration on support products for code officials and designers who assist in the design of structures or the enforcement of seismic standards.

Old Business

Ron Lynn reviewed action items from the last meeting, all of which had been dealt with.

New Business

ACTION ITEM: Ron Lynn will write a letter of thanks to Carolyn Levering expressing the Council's appreciation for her efforts in arranging an earthquake response session at the upcoming meeting of Nevada emergency managers in November. Marge Gunn can provide details if necessary.

ACTION ITEM: Rick Martin and Ron Lynn will work on arranging ATC-20 classes in both northern and southern Nevada. Alan Bennett volunteered to help set up the class in northern Nevada, assuming that FEMA funds would be available for the instructor.

ACTION ITEM: Ron Lynn appointed Jon Price, John Anderson, and Rick Martin as the Nominating Committee, which should report at the November Council meeting.

Public Comments

No comments were made.

Announcement of Future Meetings

Future NESC meetings are as follows:

- Wednesday, November 9, 2005 (Reno)
- Wednesday, February 8, 2006 (Las Vegas)
- Wednesday, May 10, 2006 (Reno) (revised from May 20th)
- Wednesday, August 2, 2006 (Las Vegas)
- Wednesday, November 8, 2006 (Reno)

REVIEW OF ACTION ITEMS

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On behalf of the Council, Ron Lynn, with help from Craig dePolo and Jim Reagan, will write a letter to Frank Siracusa, expressing concern about the plan to remove most of the C-130 airplanes from the Nevada Air National Guard. These planes may be critical for emergency response after a major event, such as an earthquake that is likely to occur in urban areas in Nevada. A copy of the letter should be sent to Congressman Jim Gibbons.

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The Nominating Committee (Jon Price, John Anderson, and Rick Martin) should report at the November Council meeting.

respectfully submitted by Jon Price, 8 August 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 Nevada Resort Association
Business and Industry, Northern Nevada	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)
State Assembly	Bernie Anderson Nevada State Assemblyman (Sparks)
Member at Large, Southern Nevada	Jim O'Donnell UNLV
Member at Large, Northern Nevada	Greg Moss The Moss Group

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Second Vice Chair-North

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Past Chair

Division of Emergency Management Representatives

Ronald L. Lynn

Burt Slemmons

Jim Reagan

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