

## Summary Minutes

### Nevada Earthquake Safety Council

10 May 2007

The Nevada Earthquake Safety Council (NESC) met from 8:00 a.m. to 5:00 p.m. on 10 May 2007 in a joint meeting with the Utah Seismic Safety Commission (USSC) at the Comfort Suites hotel in St. George, Utah. These and previous minutes are posted on the Web site for the committee (<http://www.nbmg.unr.edu/nhmipc/nesc.htm>).

Jim Werle co-chaired the meeting on behalf of the NESC; Pete McDonough co-chaired the meeting on behalf of the USSC.

#### Attendees from Nevada included:

Alan Bennett\*, City of Reno  
 Mike Blakely\*, Blakely, Johnson, and Ghusn,  
 Craig dePolo, Nevada Bureau of Mines and Geology, who held the proxy for Ian Buckle\*, University of Nevada, Reno – Center for Civil Engineering Earthquake Research  
 Terri Garside, Nevada Bureau of Mines and Geology, who held the proxy for Greg Flanigan\*, Farmers Insurance  
 Werner Hellmer, who held the proxy for Ron Lynn\*, Clark County Department of Development Services, Building Department  
 Jenelle Hopkins\*, Clark County School District, Las Vegas  
 Greg Moss\*, The Moss Group  
 Glade Myler, Office of the Attorney General (assigned to the Nevada Division of Emergency Management)  
 Marge Gunn Nutman\*, Nevada Association of Counties & Lincoln County Office of Emergency Management  
 Jon Price\*, Nevada Bureau of Mines and Geology  
 Jim Reagan\*, Sierra Pacific Power Company  
 Aly Said, UNLV Engineering  
 Ken Smith, who held the proxy for John Anderson\*, Nevada Seismological Laboratory  
 Wanda Taylor, who held the proxy for Cathy Snelson\*, UNLV Geoscience  
 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.

#### Attendees from Utah included:

Rick Allis\*, Director, Utah Geological Survey  
 Laura Ault\*, representing the Governor's Office of Planning and Budget  
 Kerry Baum\*, representing the Association of Contingency Planners; Emergency Preparedness Coordinator, Brigham Young University  
 Bob Carey, representing Michael Kuehn\*, Director, Utah Division of Homeland Security  
 Gary Christenson, Utah Geological Survey  
 Sheila Curtis\*, representing the Utah Insurance Department  
 Dean Cox, Washington County (Utah) Emergency Manager  
 Roger Evans\*, representing the Utah League of Cities and Towns; Plans Examiner, Park City  
 Jim Higbee, Utah Department of Transportation  
 Scott Holt, State Farm Insurance  
 Amisha Lester, Emergency Management Specialist, Utah Division of Homeland Security  
 Bill Lund, Utah Geological Survey  
 Peter McDonough\*, representing the American Society of Civil Engineers, Utah Chapter; Questar Gas Company

Representative Michael Morley\*, Utah House of Representatives  
 Shawn Olsen, State Farm Insurance  
 Chris Pankow, representing Walter Arabasz\*, Director, University of Utah Seismograph Stations  
 Chris Purcell, State Farm Insurance  
 Barry Welliver, representing Jake Watson\*, Structural Engineers Association of Utah  
 Boyd Wheeler\*, representing the Utah Department of Transportation

\* indicates member of the Commission

Other attendees included:

David Kennard, Federal Emergency Management Agency, Region IX, Oakland, California  
 Doug Bausch, Federal Emergency Management Agency, Region VIII, Denver, Colorado

NESC Board Members unable to attend or send a proxy included:

Bernie Anderson\*, Nevada Assembly  
 Warren Hardy\*, Nevada State Senator  
 Burt Slemmons\*, University of Nevada, Reno (retired), consultant in Las Vegas

Steve Koenig\*, Bellagio Resorts, and Jim O'Donnell\*, Geophysical Contractor, Las Vegas, offered proxies, but there were not additional Nevada attendees able to use their proxies.

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

USSC Members unable to attend included:

Matthew Cassel, representing the American Public Works Association, Utah Chapter; Psomas  
 Senator Peter Knudson, Utah State Senate  
 Matthias Mueller, Project Manager, Utah Division of Facilities Construction and Management  
 Barry Smith, representing the American Institute of Architects, Utah Chapter, HFS Architects

The minutes of the 7 February 2007 NESC meeting were unanimously approved by the NESC Board.

The minutes of the 12 January 2007 USSC were unanimously approved by the USSC members.

**Summary of Organizational Structure, Activities, Funding, Priorities, and  
 Major Successes and Failures of the Nevada Earthquake Safety Council (NESC)  
 and the Utah Seismic Safety Commission (USSC)**

Jim Werle reviewed the history and organization of the NESC, which is structured as an advisory body to the Nevada Division of Emergency Management. It is managed by the Division, the Nevada Bureau of Mines and Geology (the state geological survey, which is organized as a research-and public service unit of the University of Nevada, Reno), and the Nevada Seismological Laboratory (also a research and public service unit of the University of Nevada, Reno). Major successes include the development of guidelines for geotechnical investigations of faults and fissures and guidelines for geotechnical investigations of liquefaction and passage of a bill by the Nevada Legislature that requires local jurisdictions to follow the seismic provisions of the International Building Code and to adopt standards for geotechnical investigations of faults and liquefaction. Perhaps a failure has been that the Council has not yet followed up with making sure that local jurisdictions have adopted these standards.

The NESC has 22 board members, a chair and four vice chairs (two from northern Nevada and two from southern Nevada). Board members include two for many positions so that there is representation from both northern and southern Nevada. Most other positions are viewed as having statewide responsibility. The board members include two from business and industry, one from the insurance industry, one from state government, two from local government, one from seismology, two from geosciences, two from engineering,

one from education, two from community organizations, two from universities, two building officials, one state senator, one state assemblyman/woman, and two members at large.

The NESC recommends priorities for special projects that are proposed for available funding from FEMA or the Nevada Division of Emergency Management. These have typically been year-end funds.

Another success has been Earthquake Awareness Week, wherein there has been a statewide effort to focus on earthquake awareness. In addition, the Nevada School Seismic Network run by the Nevada Seismological Laboratory has been used to supplement the Laboratory's regular network and to help educate the public. The Laboratory has also expanded its efforts in education and outreach to include a summer workshop for teachers.

Glade Mylar pointed out that many tabletop exercises have been emphasizing earthquake issues, including legal issues. Wanda Taylor noted that NESC has provided supplemental funding (along with a major grant from the U.S. Department of Energy) to educate the public about earthquake hazards in southern Nevada. Greg Moss noted how important it has been to have private-sector involvement in the Council.

Pete McDonough reviewed the USSC, which held its first meeting in July 1994. They have 15 members (three added in 2000) and two ex officio members, a chair, and two vice chairs. Prior to the USSC, there was a Utah Seismic Safety Advisory Council (1977-81), an Earthquake Task Force of the Utah Advisory Council on Intergovernmental Relations (1989-1991), and a Utah Earthquake Advisory Board (1991-1994). The USSC was formed by an act of the Utah Legislature (which opened its 1994 session on the day of the Northridge, California, earthquake – January 17). The USSC is one part of the overall Earthquake Program for Utah. Other components include the Utah Division of Homeland Security (DHS), University of Utah Seismograph Stations (UUS), Utah Geological Survey (UGS), and the Structural Engineers Association of Utah.

Members of the USSC come from DHS, UGS, UUS, Utah League of Cities and Towns, Utah Department of Transportation, American Institute of Architects, American Society of Civil Engineers, State Planning Coordinator (Governor's Office of Planning and Budget), Utah House of Representatives, Utah Senate, Utah Division of Facilities Construction and Management, American Institute of Architects, Structural Engineers Association of Utah, Utah Department of Insurance, Association of Contingency Planners, and American Public Works Association. (The latter three were added in 2000.) Ex officio members include the U. S. Geological Survey (USGS) and Federal Emergency Management Agency (FEMA).

Initial standing committees of the USSC included Awareness and Education, Geosciences, Engineering and Architecture, Lifelines and Infrastructure, and Intergovernmental Relations. The Geosciences Committee has morphed into active geoscience working groups. The Engineering and Architecture Committee has morphed into an active ad hoc unreinforced masonry (URM) working group.

Funding from the Legislature for the USSC has been \$4,100/year in recent years. The USSC is allowed to accept grants. They do not have permanent staff, but UGS and DHS provide support (by statute).

Some successes of the USSC are highlighted in bullet form below.

In the area of awareness,

- Strategic Plan for Earthquake Safety (1995)
- Conferences promoting business and institutional planning and presenting awards for seismic safety (1996, 1997, 1998)
- Awareness conference for the general public (2002)
- Published progress reports (1996, 2000, 2007)
- Regional meetings outside Salt Lake City (1998 in Brigham City, 2000 in Provo, 2001 in Ogden, 2007 St. George)

- Survival of sunset review in 2004 (now USSC is not under a sunset clause)
- Member of Western States Seismic Policy Council (WSSPC)
- Annual Earthquake Awareness Month

In the area of outreach,

- USSC meeting attendance and participation includes outside groups (insurance companies, Utah State Office of Education, school districts, engineers)
- The new URM Ad Hoc Advisory Committee is actively engaged.
- Off-site meetings hosted by others (Jordan Valley Water Conservation District (JVWCD), Utah Alcoholic Beverage Control (ABC) – warehouse built with earthquake shaking in mind, Consonus – company that holds computerized records)
- USSC tours of earthquake projects (BYU, State Capitol earthquake retrofit on base isolators (\$212 million), Utah ABC, JVWCD, Consonus)

In emergency response,

- Pushing for Community Emergency Response Team (CERT) training
- ShakeMap and HAZUS implementation
- ATC-20 training

In education,

- Student research grants program
- Teacher workshops
- UUSS Earthquake Education Services – display and curricula
- “Prepared Schools Program” (drills, emergency response plans)

For school buildings,

- Pushed for structural engineering reviews of new building plans
- School building-safety evaluations by Wasatch Front school districts
- 2007 Utah Office of Education building safety initiative (\$500 million over 10 years – proposed but not approved)

For infrastructure

- Advanced seismic design, I-15 rebuild through SLC for the 2002 Olympics
- 1998 earthquake education program for water and wastewater system operators
- Evaluation/upgrade of major water-system facilities (Metro, Jordan Valley)
- Natural gas system improvements (e.g., using a “geofoam” to cushion pipelines)

For buildings

- 1996, 2006 presentations to the State Building Board to include seismic safety in planning
- BYU seismic strengthening program (all buildings now retrofitted or rebuilt)
- Parapet-safety brochure
- State Capitol retrofit
- URM initiative – just starting

From FEMA’s Pre-Disaster Mitigation Grant Projects and FEMA’s Hazard Mitigation Grant Program,

- University of Utah Marriott Library retrofit (\$2.9 million as part of a \$70 million project)
- Several other earthquake-related projects (Jordan Valley got \$2 million for a new project; old Salt Lake City library, which is being converted to an educational center)
- Retrofitting of Weber State University’s student union.

In instrumentation,

- Wasatch Front Advanced National Seismic System strong-motion instrumentation
- 2007 improved seismic instrumentation in southern Utah (approved by the State Legislature)
- ShakeMap/HAZUS implementation for emergency response
- I-15 bridge, State Capitol Building to have strong-motion instruments

For local governments,

- 1999 USSC local government guidelines Advisory Committee
- Geologic hazards special-study-area maps
- Brochures explaining hazards, risk reduction, liabilities, and cost benefits
- Building official training
- Presentations to cities

In geoscience

- 2000, 2004 Geologic Hazards Conferences
- 2003-2007 Earthquake Working Groups (replaced the Geoscience Standing Committee)
- Salt Palace forum – controversy over faults discovered during expansion of the facility
- Ground-shaking brochure
- County IBC spectral-acceleration maps
- Post-earthquake technical clearinghouse plan

Some USSC failures included

- 1996 attempt to dedicate state funding for seismic upgrades of state buildings
- 1996 proposal for earthquake engineering research at Utah universities
- 2007 Legislative Resolution to inventory and address URMs.

Remaining challenges for USSC include:

- Inactivity of most standing committees
- Few recent (post 1998) non-technical conferences or awards presented
- Need for formal update of 1995 strategic plan
- Publication of peer-reviewed scenario HAZUS loss estimates

### **How Prepared Are? How Prepared Should We Be?**

Bob Carey and Craig dePolo moderated a discussion about preparation for earthquakes.

Bob Carey discussed Utah House Bill 103, which was recently passed by the Utah Legislature and signed by Governor Huntsman. The bill is a statewide mutual aid act (for mutual aid among counties within the state). He also noted that the Legislature passed House Bill 46, a bill for state disaster funding recovery, particularly for counties with smaller populations than the big cities.

Glade Myler noted that the Emergency Management Assistance Compact (EMAC) allows for accepting credentials of professionals from other states. For FEMA to reimburse states for EMAC expenses, there must be a Presidential declaration of disaster.

Bob Carey proposed that there should be Memoranda of Understanding (MOUs) between Basin-and-Range states to allow EMAC-type assistance for disasters that do not reach the level of a Presidential declaration.

Craig dePolo discussed scientific needs following the next major Basin and Range earthquake. The overarching goals are to create microzonation (that is, identify areas of highest earthquake hazards versus areas with lower hazards) and increase preparedness. How do we build communities to minimize the impact from earthquakes? Where should we avoid putting buildings or concentrating utilities? Where are the best

places for them? What shaking frequencies are dangerous in a particular part of a basin? One of the problems is that there have been only about a dozen major historical earthquakes in the Basin and Range, only eleven of which had surface ruptures. The last one was Borah Peak, Idaho, in 1983. We lack modern data sets. We need to maximize the amount and quality of information we get from the next event. Most studied earthquakes are urban disasters; however, we don't fully understand how to make the rural environment earthquake resistant. There is limited feedback on how well our building codes are working. This all means that there is limited protection from the next rural earthquake in Utah or Nevada.

Some of the activities that scientists will do immediately after an earthquake include:

- Evaluating the potential for further earthquakes (additional shaking – Was the earthquake that occurred a foreshock of a larger earthquake? Will there be significant aftershocks?)
- Evaluating slope failure (landslides, lateral spreads, whether there is the potential for imminent failure, potential progressive failure, potential shaking failure from aftershocks)
- Documenting additional surface rupture.

Types of investigations that will be needed after a major earthquake include:

- evaluating earthquake intensity and attenuation,
- learning about what did and didn't perform from an engineering standpoint,
- how lifelines performed,
- how people responded,
- how better communication may have helped, and
- measurements of earthquake effects (geologic, seismologic, geodetic, and geotechnical).

These investigations need to begin right away after the earthquake, because highways tend to be repaired almost immediately after earthquakes, and because earthquakes in the Basin and Range province tend to come in groups (e.g., as in the 1954 sequence near Fallon, Nevada). With good, well-learned lessons, new information can be turned into accepted practices, and wise policies can be developed for the future.

Craig dePolo suggested that there should be a future workshop on rural earthquakes. Bill Lund noted that some of the tornado damage in the Midwest could be useful analogs for rural earthquakes. David Kennard suggested that planners need to be involved in such a workshop. For scientific and technical clearinghouses to be covered by FEMA, it is best for the state to include the need for the clearinghouse in its emergency response plan (at least under the Emergency Response Function for Information, ESF-5).

Wanda Taylor suggested that Peg Rees, Director of the Public Lands Institute at UNLV, may be able to help with access to federal lands, if this may be an issue immediately after an earthquake.

Gary Christenson described the concept of a post-earthquake technical clearinghouse and Utah's plans for a clearinghouse. The goals are to provide useful information to emergency responders and managers and to maximize information collection from science and engineering investigations. The physical location of the clearinghouse is generally near the damaged area. Key functions are sharing of information to help with necessary investigations and relaying key information to the emergency operation center (EOC). The clearinghouse compiles technical databases to document the effects of the earthquake, including the ATC-20 forms used by engineers in their initial surveys, and creates geographic information system (GIS) databases.

Gary Christenson also discussed the "window of opportunity" for prioritized actions to be taken in the event of a major earthquake. The amount of time, based on experience in other states, is about two years. Some issues to anticipate include:

- Building code enforcement/plan reviews
- Performance of public facilities (schools, hospitals, bridges, lifelines)
- 185,000 URMs in Salt Lake Valley
- Standards of geological practice
- Implementation of local government ordinances (e.g., zoning)

- Legislation to reduce earthquake risks
- Funding for earthquake-program staff
- Greater state involvement in loss reduction
- Building/lifeline initiatives
- Agency funding requests for specific projects
- Risk-reduction bills (e.g., California Alquist-Priolo Act that established setbacks from active faults, California Seismic Safety Mapping Act that established a program for mapping liquefaction and landslide hazards).

Gary suggested that the Western States Seismic Policy Council should hold a workshop on post-earthquake roles.

### **Presentation**

Pete McDonough honored Barry Welliver with a letter from the USSC and a plaque from the Governor in recognition of his service on the USSC from 2000 to 2006, including chairing the commission from 2002 to 2006.

### **Anatomy of a Disaster – The 2005 St. George Floods**

Dean Cox provided a keynote PowerPoint presentation titled “Baptism by Fire and Water – The Anatomy of a Disaster” on the 2005 St. George floods. He recalled the September 2, 1992 St. George – Hurricane Fault earthquake (magnitude 5.8), which occurred several months after the June, 1992 Landers earthquake in California. Washington County has been the fastest growing metropolitan area in the U.S. in the last five years. The flooding in January of 2005 came at the end of seven years of severe drought. The lack of mountain snow meant no significant spring runoff events cleaned or maintained river channels during the drought period. Salt cedar (tamarisk) and cottonwood trees flourished the riparian areas. Drought lowered the moisture content in interface fuels to tinder-dry levels. In the summer of 2004, fires exacerbated by the invasion of cheatgrass burned tens of thousands of acres of land in the county. In October 2004 there was a small rainfall event (2 inches) that filled several reservoirs and caused flooding in local areas. The county proposed to the Natural Resources Conservation Service (NRCS) that they help pay for emergency stream cleanup to remove debris that would worsen future flood hazards, but the NRCS declined to do so. For the week from the end of December into the beginning of January, the watershed received about 15 inches of precipitation. Had they not had 60,000 sandbags in place before the St. George flood, damage would have been much worse. Some county-operated communication repeaters had lost solar power because of lack of sunshine. Rain on snow followed by even more rain caused the January 2005 flooding, but fortunately there was only snow above 8,000 feet. The Santa Clara River (which runs into the Virgin River in St. George) began flooding and washed out cottonwood trees, which dammed the river, causing widespread damage. The actual flow was only 8,000 cubic feet per second at the confluence of the two rivers (statistically a flood that occurs about once every 65 years). The Gunlock Reservoir overflowed (for two years). The county lost 7 bridges, as did the City of St. George. Enterprise Reservoir overtopped by four feet. There was concern that spring snowmelt would cause additional flooding. Near homes, shortly after the January flood, the Virgin River banks were armored with riprap to help minimize erosion during future floods, but the NRCS rules allow armoring only to the height of the previous event. Cheatgrass flourished later in 2005 (when 262,000 acres, or 15% of the county, burned), and another 177,000 acres burned in 2006.

### **Kiholo Bay Earthquake**

David Kennard reported for Jeff Lusk on the Magnitude 6.7 Kiholo Bay earthquake on 15 October 2006. The earthquake was just offshore northwest of the Big Island of Hawaii. The USGS’s “Did You Feel It” map was more useful than their ShakeMap, because there were few operating strong-motion seismic instruments on the north side of the island. Jeff was detailed to work the event. Communications with the USGS’s Hawaii Volcano Observatory (HVO) were down right after the earthquake. Power was lost on Oahu for up to 11

hours after the earthquake; this surprised many people, because the earthquake was far from the island of Oahu. Jeff worked with counterparts in FEMA, including Doug Bausch, to coordinate HAZUS runs. There was one catalogued HAZUS run in Hawaii's atlas of earthquakes that was similar to the event. The level-3 HAZUS information (more detailed than the default data) was used. The run of record for HAZUS is one performed by the State Civil Defense in Hawaii and by the Pacific Disaster Center. Jon Price noted that Nevada's emergency management plan calls for the Nevada Bureau of Mines and Geology to create the official HAZUS run of record. Bob Carey stated that Utah Division of Emergency Management controls the official HAZUS run of record.

Jeff Lusk flew to Hawaii on a charter flight the day after the earthquake; CNN reporters and other media accompanied FEMA on the flight. Jeff briefed FEMA senior staff on Hawaii's preparedness. On the third day, FEMA coordinated sending Joint Preliminary Damage Assessment teams. (FEMA staff were actually on the island within a few hours after the event to rapidly assess damage.)

Jeff had previously run an ATC-20 training session in Hawaii, so there were a good number of individuals available for rapid visual inspection of damaged buildings. FEMA was concerned about tsunami potential, but only from aftershocks. The main earthquake was so close to shore that any tsunami would have occurred within minutes after the earthquake. Landslides, however, could have been induced by aftershocks, and those landslides could have caused tsunamis.

Hawaii has some unique construction practice (including "tofu block" supports for buildings, in which the building is not secured to the foundation but rests as posts on piers). Also, many rock walls were damaged during the earthquake. The Earthquake Engineering Research Institute (EERI) report that was produced after the disaster documented the failures of rock walls. The 2003 International Building Code (IBC) had not been adopted, but Hawaii is on track now to adopt the 2009 IBC.

In the first week, Jeff assisted the Federal Coordinating Officer (FCO), including helping with public outreach efforts, creating documentation to support modification of the declaration (to allow for ongoing incidents related to aftershocks). David suggests that the State emergency managers include language to the effect that the incident period for an earthquake include the word "and ongoing" to cover effects from aftershocks. David also suggested that someone from the State's Attorney General's office participate early during the disaster. Jeff also helped with communication to other groups, including the USGS HVO.

David noted that the FCO on scene has the authority to instruct other federal agencies to grant access to land or other needs if necessary for disaster response or recovery. Nancy Ward is the FEMA Region IX Regional Administrator; she is working on a standard letter of instructions to FCOs. David will suggest to Nancy that she include in this letter information on the need for a technical clearinghouse during the response and recovery period.

One of the concerns was that the Kawaihae Harbor infrastructure was more damaged than would have been expected from this earthquake. Jeff was able to secure funding for an investigation and report on this issue. He also secured funding for training of local officials and individuals in the building trades and for HAZUS technical assistance to migrate data from the HAZUS 1999 model to the HAZUS-MH model. There will also be a post and pier construction (tofu block) analysis, with recommendations for mitigation actions. There was an analysis of best practices (e.g., generators for harbors, hardening communication repeaters) with joint press releases demonstrating the value of mitigation.

### **ShakeMap/HAZUS Demonstration Projects and Potential Interstate Needs**

Doug Bausch discussed FEMA's priority maps from HAZUS, including ground shaking, casualties, severe life-threatening injuries, fatalities, short-term public shelter needs, hospitals, highway infrastructure, urban search and rescue needs, economic losses to buildings, population, households without potable water, households without electricity, debris, and others. He used a Magnitude 7.0 scenario for a Wasatch Front

earthquake near Salt Lake City as an example. The scenario estimates about 185,000 URMs in the Salt Lake City area. About 70% of the severe (HAZUS 3 & 4) casualties are caused by URMs, which provides good justification for mitigation of these buildings. The number is closer to 90% for the New Madrid fault zone in the Midwest.

Doug also discussed the state-to-state Emergency Management Assistance Compact (EMAC), which has been adopted by all 50 states plus Washington, DC, Puerto Rico, and the Virgin Islands. The EMAC program is authorized by Congress. For Hurricanes Katrina and Rita, 68,000 personnel were deployed (including nearly 21,000 civilians in Mississippi). Approximately 47,000 National Guard personnel were deployed to Louisiana. EMAC has been used 72 times since its inception. Doug suggests that all states should have intrastate mutual aid agreements (county-to-county; county-to-city). Both Utah and Nevada have such agreements.

Chris Pankow noted that the Utah ShakeMap-HAZUS Working Group is helping to improve the HAZUS scenarios. This working group involves professionals from several technical areas.

Doug noted that some HAZUS runs for Hawaii were within 20% of actual overall economic loss. Even the most discrepant HAZUS runs for Hawaii were within a factor of 2. HAZUS runs for the Nisqually, Washington earthquake were off more, because the default 10-kilometer depth was significantly shallower than the actual depth of that earthquake, and some HAZUS runs only used the default depth.

### **Planning for the Future – Top Actions**

Jim Reagan discussed Nevada's efforts to create a list of the Top 5 Action Items for Nevada, condensed from the Top 10 Action Items for Northern California (from the San Francisco 1906 100<sup>th</sup> anniversary conference). Jim is chairing an effort to bring a group of emergency managers (private and public) and other professionals together to formulate the list. He stressed the need for connection to other plans in the hazard-mitigation and homeland-security arenas. The working group is looking at the Top 5 that can be achievable in five years. The working draft includes the following (not necessarily by priority):

1. Know your earthquake risk.
2. Prepare for effective emergency response to an earthquake disaster.
3. Make Nevada's buildings have life-safety resistance during earthquakes.
4. Plan to recover from an earthquake disaster.
5. Plan for efficient tourist management and well being during and following a disaster.

The working group is trying to have a draft proposal for the August NESC meeting.

Gary Christenson discussed putting together a "Putting Down Roots" newspaper insert for Utah. The Utah Geological Survey is compiling a draft. They hope to find funding for printing during Utah earthquake awareness month (April, 2008).

Roger Evans suggested that the joint NESC-USSC group develop a list of three or so goals. He advocated (1) training for building officials (ATC-20, CERT, HAZUS); (2) legislation (specifically a seismic notification ordinance); (3) quality code enforcement during construction; and (4) information sharing.

Barry Welliver discussed the critical need to deal with URMs. The current estimate of 185,000 URMs in the Salt Lake City area is astonishing. Whereas in California most URMs are commercial, in Utah most are residential. Proposals for legislation need to come from the public.

Representative Michael Morley discussed what is achievable through the Legislature. He noted that he is a general contractor (with a history of five generations in masonry). Politically, those items that have the biggest constituency have the most chance of passage. After a major earthquake it will be easier to pass legislation than it is now. The key is to keep the information out there. One item to keep in focus is non-structural mitigation. The State of Utah is working diligently to deal with State buildings, and the LDS

Church is addressing the seismic hazards of their historical buildings. There will be concerns regarding property values if URM legislation covers residential structures.

Scott Holt spoke about the insurance industry's perspective on earthquake hazards. State Farm Insurance covers about \$4 billion in earthquake insurance in Utah and about \$760 million in Nevada. They will insure URMs. Allstate is no longer writing earthquake insurance in any state. Some individuals may be denied coverage, because the companies writing policies require inspections.

Ann Wiswell noted that the Nevada Public Agency Insurance Pool covers \$100 million in earthquake insurance for 103 Nevada public agencies. There are some issues regarding the way reinsurance companies are exposed regionally.

Rick Allis led a discussion about goals. He stressed the need for a few goals to be met within the next year. For Utah, he suggested:

- One goal is creation of a "Putting Down Roots" document (with Walter Arabasz, Gary Christenson, Bob Carey, and Barry Welliver in the lead).
- Another is to create a publication on HAZUS runs for Utah (with Rick Allis in the lead).
- Holding more FEMA training sessions (ATC-20 and HAZUS, in particular, with Roger Evans in the lead).

Others suggested a goal of developing plans for activating building inspectors, particularly with help from California through EMAC. Barry Welliver advocated going together with NESC and USSC to ask California for assistance with building inspectors.

Jim Reagan, Jon Price, Craig dePolo, and Wanda Taylor mentioned several items for Nevada.

- Development of the Top 5 Action Items for Nevada (Jim Reagan and the working group mentioned previously)
- Creation of a new Earthquake Fault Map for Nevada (Craig dePolo)
- Updating HAZUS runs (and publication) for each county seat in Nevada (Craig dePolo and Jon Price)
- The Geoscience Department at UNLV will be co-hosting the Geological Society of America's joint Rocky Mountain and Cordilleran Section meeting in the spring (likely mid to late May) of 2008. Wanda Taylor will be proposing a symposium on Earthquake Hazards in Southern Nevada during this meeting.
- Developing the message(s) to relay to the public and decision makers during the window of opportunity after a major earthquake.

Craig dePolo also advocated holding a joint NESC-USSC workshop on rural earthquake issues during the next two years.

Glade Myler cautioned to keep the Attorney Generals involved to make sure all initiatives follow state laws.

Rick Allis asked each state if they are ready for the window of opportunity – the few days after a major earthquake.

Craig dePolo advocated developing a list of the top 5 items for individuals to do. Mike Blakely noted the need for earthquake and other emergency plans for individuals and businesses. His company has backups of all its files at its Las Vegas and Reno offices. Mike advocated that better plans be made for activating professional engineers/inspectors after an earthquake.

Barry Welliver noted that the Lieutenant Governor has a list of 12 items for individuals and businesses regarding earthquakes.

Jon Price noted that separate items should be developed to address opportunities for different sectors- individuals, businesses (small and large), the State Legislature, and our federal Congressional delegations.

Alan Bennett advocated participation of the NESC and USSC with earthquake information exhibits at home shows.

Rick ended the discussion by advocating that each commission/council identify three key action items for the next year.

### **Where Do We Go From Here?**

Jim Werle and Pete McDonough led a discussion on future meetings of NESC and USSC.

Jon Price noted upcoming meetings of opportunity (see announcements).

Craig dePolo suggested that a rural earthquakes meeting in Wendover be a focus for NESC and USSC discussions.

Barry Welliver suggested that the NESC and USSC plan on meeting once every two years.

Wanda Taylor suggested that an MOU be drafted for cooperation between NESC and USSC.

### **Announcements**

Pete McDonough discussed the next meeting of the USSC- Friday, July 13, 2007 (Salt Lake City).

Chris Pankow announced that June 29 of this year is the 100<sup>th</sup> anniversary of seismic monitoring in Utah. There will be a celebration on the University of Utah campus.

Idaho will be observing the 25<sup>th</sup> anniversary of the Borah Peak earthquake in 2008.

Future NESC meetings and locations include:

Wednesday, 1 August 2007 (Carson City, at the Division of Emergency Management)

Wednesday, 14 November 2007 (Las Vegas).

The Nevada Hazard Mitigation Planning Committee plans to meet immediately after the August 1<sup>st</sup> and November 14<sup>th</sup> NESC meetings.

The Western States Seismic Policy Council annual meeting, jointly with the International Code Council, will be September 30 to October 2 in Reno. Both NESC and USSC are now voting members of WSSPC.

The next National Earthquake Conference will be in April 23-26, 2008, in Seattle. The California Seismic Safety Commission is advocating holding a session for the earthquake/seismic safety commissions the day before that meeting (April 22). Jon Price suggested that NESC and USSC express their enthusiasm for this session. Bob Carey noted that during the conference there will be sessions on technical clearinghouses and on issues regarding rural earthquakes.

### **Public Comment**

None.

respectfully submitted by Jon Price, 1 June 2007

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