

Utah Seismic Safety Commission

Quarterly Meeting Minutes

On October 25, 2012, a regularly scheduled quarterly meeting of the Utah Seismic Safety Commission (USSC) was held in the State Office Building, Room B110. Vice Chair Rick Allis called the meeting to order at 9:00 AM.

Members Present:

Rick Allis	Utah Geological Survey
Keith Koper	University of Utah Seismograph Stations
Peter McDonough	American Society of Civil Engineers
Meldee Love	Utah Department of Insurance
Enzo Calfa	Utah Div. of Facilities, Construction and Management
M. Leon Berrett	American Public Works Association
Jeremy Achter	Structural Engineers Association of Utah

USSC Staff Present:

Chris DuRoss	Utah Geological Survey
Steve Bowman	Utah Geological Survey
Bob Carey	Utah Division of Emergency Management
Sheila Curtis	Utah Division of Emergency Management
Katie LeLaCheur	Utah Division of Emergency Management

Guests Present:

Barry Welliver	Earthquake Engineering Research Institute
Glen Palmer	Palmer Engineering
Leslie Randle	Northridge Elementary
Steven Bartlett	University of Utah
Kevin Franke	Brigham Young University
Scott Holt	State Farm Insurance
Brian Maffly	Salt Lake Tribune

Members Not Present:

Roger Evans, Chair	Utah League of Cities and Towns
Keith Squires	Utah Division of Emergency Management
Michelle Jones	Association of Contingency Planners
Senator Jerry Stevenson	Utah State Senate
Rep. Mike Morley	Utah House of Representatives
Mark Peterson	U.S. Geological Survey (Ex-Officio)
Doug Bausch	Federal Emergency Management Agency (Ex-Officio)

Evan Curtis
Josh Sletten

Governor's Office of Budget and Planning
Utah Department of Transportation

Welcome

Introductions were made of members and guests present. A motion was made for the approval of the July 19, 2012 Meeting Minutes. The motion was made by Peter McDonough and second by Leon Berrett. The minutes were approved.

Introduction

Rick Allis introduced himself and gave Roger Evans apologies for his absence. He introduced an addition to the agenda. Before the break, a brief discussion of the jailing of scientists in Italy will be added to the agenda.

Discussion - Planning for the 2013 Legislative Session

Rick began the discussion on the updates for the 2013 legislative session by reading an email from Roger Evans. The email stated that while at the October 2012 Business and Labor Interim Committee meeting Roger talked with Representative Gage Froerer. Rep. Froerer informed Roger that he plans to reintroduce 2012 House Bill (HB) 414 (School Bonding for Seismic Purposes). Roger expressed that the USSC needs to make a decision about how to proceed on these issues.

Leon Berrett provided an explanation of the current legislation and issues in relation to the Parapet Ordinance (2012 HB 305). The new bill has proposed changes that would weaken the standards of seismic safety. Rep. Froerer is supporting the new bill and will oppose the sun-setting of the current bill. If the current legislation is allowed to sunset then stronger past legislation would be put back into effect.

Keith Koper expressed his concern over supporting any bill that weakens seismic safety standards and proposes supporting the sunset of current legislation. Discussion was continued about the issues of seismic safety vs. cost and ability to pass new legislation. As a result of the previous discussion the following motion was made.

Motion: *The Utah Seismic Safety Commission expresses concern about the weakening of recent seismic safety legislation and we strongly support any seismic safety initiatives that strengthen the construction code which provides for the safety of the public, including the reinstatement of the original parapet ordinance.*

This motion was made by Leon Berrett and second by Keith Koper. The motion was passed.

Discussion - The Conviction of Six Italian Scientists

Keith Koper described the circumstances that led to the conviction of six Italian scientists following the L'Aquila Earthquake. There was an ongoing swarm of minor earthquakes in the area. The scientists were called in to assess the risk for a larger earthquake due to the swarm. The message that was communicated to the public was that there was very low risk of a major earthquake. The L'Aquila earthquake struck and hundreds of people were killed. In response to this, the scientists were convicted and jailed. The discussion turned to the consequences of this event. It is very important that professionals in this field be very careful, especially when working with the media, about the messages they send. This event can be used as a learning experience for everyone in this field.

Discussion - Wasatch Front Liquefaction Hazard and Risk

Rick Allis introduced the discussion topic of the Wasatch Front Liquefaction Hazard and Risk. He explained that this topic was selected as an agenda discussion item to educate everyone on the liquefaction hazard risk.

Barry Welliver - What is Liquefaction?

Barry presented a slideshow that provided a basic introduction to what liquefaction is. Liquefaction occurs when groundwater is introduced to soils causing them to lose their strength and behave like a liquid. This can cause flow failures, lateral spreads, and settlements. Barry stated that strengthening structures, using the appropriate foundations, and stabilizing soils are all possible mitigation options. Barry then went on to show part of a presentation made by Doug Bausch on the similarities between Salt Lake and Christchurch. Barry explained that both Salt Lake and Christchurch have population centers and central business districts sitting on an earthquake source, both have similar building code adoption and enforcement histories, and both have significant risk of liquefaction and landslide hazards. He briefly discussed the aftermath of the Darfield Earthquake mainshock and aftershock. He showed maps of liquefaction and talked about the recovery from liquefaction in Christchurch.

Steve Bartlett - Probabilistic Liquefaction-Induced Ground Displacement Maps

Steve presented a plan for developing the next generation of liquefaction hazard maps. He explained that Utah Liquefaction Advisory Group has been functioning since 2003 and has been working to achieve four objectives.

Objective One: The first objective is to develop probabilistic liquefaction maps for urban counties in Utah. The Liquefaction Advisory Group has identified Salt Lake, Utah, Davis, Weber and Cache Counties for liquefaction map development. Steve indicated that the Salt Lake County and Weber County maps have been completed. He then went on to explain that there are three types of maps being produced. 1. Liquefaction Potential Maps (which indicate the probability of triggering liquefaction), 2. Lateral Spread Displacement Hazard Maps (indicate damage potential caused by liquefaction) 3. Liquefaction-Induced Ground Settling Maps (indicate damage potential caused by liquefaction).

Objective Two: The Liquefaction Advisory Group's second objective is to develop ArcGIS Programs for implementing probabilistic mapping procedures for other regions in the U.S. They primarily use methods based on ArcGIS algorithms. Estimates on the strong ground motion hazard are collected from the Probabilistic Seismic Hazards Analysis (PSHA) and the National Strong Motion Mapping Program sponsored by the USGS.

Objective Three: The third objective set by the Liquefaction Advisory Group was to establish and populate a subsurface geotechnical database for public use. Steve explained that the data, collected during the mapping process, can be valuable to other projects such as geotechnical evaluations, land use planning and research. Steve also mentioned that the database could be useful to potential partners such as Utah Department of Transportation (UDOT), Salt Lake County, and Salt Lake Cities.

Objective Four: The fourth objective is on education and public outreach. Steve expressed the need to create user friendly maps, assist counties in implementation and ordinances, and to develop outreach seminars and a website. Steve discussed that they are working with the Federal Emergency Management Agency (FEMA) and the UGS on meeting this objective.

Steve continued to present several probabilistic liquefaction maps of Salt Lake County. He discussed the development of the maps and explained what each map displays. In conclusion Steve mentioned that future work will include the continuation of the implementation of maps, map production for Davis and Utah counties, and production of damage and risk assessments.

Pete McDonough - Infrastructure at Risk and Examples of Mitigation Methods

Pete presented on the work he did for Questar last year on piping requirements in regards to liquefaction risks to infrastructure. He began by stating that the most important part of mitigation is knowledge. While working with Questar last year he looked at their entire natural gas system to evaluate all of their seismic risks. As part of this evaluation Pete used a probabilistic analysis using a 2500 year return period. He used the USGS deaggregation website methodologies to generate PGA values for Questar's natural gas system. Pete displayed maps with the peak ground acceleration (PGA) values throughout the state and gave a brief overview of the information.

Pete explained that natural gas pipe is more robust than water pipe. This is because the piping used for natural gas lines is very ductile and can withstand several feet of displacement without being damaged. One of Questar's main mitigation strategies is that they have numerous valves with isolation areas throughout their natural gas system. If there was damage to the system, the area could be isolated, repaired, and re-lit. Another mitigation technique is the use of polyethylene pipe. This pipe is used for the distribution systems because it is so ductile. A very ductile steel pipe can also be used safely for these systems. Questar is also using Geofoam, a very light-weight material, which can create a cushion around natural gas pipes. It crushes and deflects after a major earthquake. A polyethylene blanket can be put around the pipe to reduce friction during movement. There are many mitigation techniques that Questar employs to protect against liquefaction risks.

Pete mentioned that another concern is that water systems are not very ductile and the pipe used tends to pull out readily. Pete expressed his concern that presents a significant risk for fires. Rick asked about the risk associated with the connections to building on the older water systems. Pete first explained that even in newer homes, plastic cannot be used above ground because the plastic will degrade over time. He asserted that the primary concern, with the water systems in homes, is with water heater failure. Homeowners can strap their water heaters down to help reduce this risk. They can also install seismic shut-off valves. These shut-off valves can also have a lot of false trips, so they are not recommended by Questar or other gas companies. Excess flow valves are used in newer homes and service lines.

Kevin Franke - Liquefaction: Where Do We Go From Here?

Kevin presented on liquefaction mitigation strategies from a "birds-eye view". He began by briefly reviewing that liquefaction is a major hazard that threatens critical infrastructure in Utah. He suggested three possible strategies for addressing Utah's liquefaction hazards. The first strategy is to advance our understanding. Kevin emphasized that there are many aspects of liquefaction that we do not fully understand. He reaffirmed that the key to planning, preparing, and mitigating against liquefaction hazards is a thorough understanding liquefaction. The second strategy proposed was to identify areas of critical concern. Kevin explained that much of our infrastructure is located on the Wasatch Front and this increased the risk of liquefaction damages. The third strategy, presented by Kevin, was to encourage intelligent engineering practices. He asserted that liquefaction risks can be reduced if proper engineering practices are followed. Kevin stated his belief that these three generic strategies could significantly reduce the risk of liquefaction hazards throughout Utah. He asked that the USSC consider these strategies when addressing liquefaction hazards.

Rick called attention to the major investment that will come from the airport in the next few years. The airport is in a very high risk area of the valley and the airport will be

investing a significant amount of money in new terminals. Rick indicated that this could possibly be an opportunity for research on liquefaction in the area. There was discussion on the plans for the airports renovation and the newest design criteria for liquefaction. There is no action being taken to prevent against liquefaction hazards for residential buildings. It was suggested that ordinances need to be in place to encourage homeowners to take appropriate action to protect themselves against liquefaction hazards. Residential building codes are not as strict as commercial building codes.

Reviewing the USSC Service Award

Bob Carey stated that it had been requested that the USSC create a service award and present it, as a commission, to Ivan Wong of URS. In the past the USSC sponsored an annual conference where they gave a similar award away. Bob indicated that presenting this award would bring the USSC back to its roots. **Chris DuRoss** took a few minutes to describe the award. The award will be sponsored by the USSC and presented at the upcoming Seismological Society of America meeting. The award will be presented in the form of a plaque.

Motion: *The Utah Seismic Safety Commission will present their USSC Service Award to Ivan Wong at the Seismological Society of America meeting in April in Salt Lake.*

This motion was made by Pete McDonough and seconded by Keith Koper. The motion was passed.

News Items

Leon Berrett reported on the Utah League of Cities and Towns (ULCT) annual meeting. He stated that they had good attendance and a good response there. Leon also discussed Roger's presentation on unreinforced masonry buildings (URMs) at the Utah Public Safety Summit. He believed that was successful as well. Leon mentioned that they presented at the American Public Works fall chapter meeting. This meeting didn't have as high attendance, but was a successful presentation.

Barry introduced the new Earthquake Engineering Research Institute (EERI) Utah Chapter to the USSC. He mentioned that they will be holding their first official chapter meeting in January at the University of Utah. Barry explained that the new EERI Utah Chapter intends to work on common projects with the USSC.

Rick mentioned that the Seismological Society of America (SSA) conference will be held in Salt Lake City this April. It will overlap with the Great Utah Shakeout Drill. There will be a town hall meeting that will be a great opportunity to connect with the media.

Pete gave a word of thanks to Leon for representing him at the upcoming Western States Seismic Policy Council (WSSPC) board meeting.

Enzo brought up the point that we currently adopt building codes every three years. The Business and Labor Committee is currently looking into changing the building code adoption cycle to every six or nine years. This could hinder the use of the most modern engineering techniques. Rick agreed that this is an issue that will likely be on the agenda for the next USSC quarterly meeting.

Bob stated that the Great Utah Shakeout Drill will be held on April 17th and Utah's DEM will do a follow-up exercise the following day. He extended an invitation for anyone who would like to participate in this. Bob also reported on the budget. He explained that they have zeroed out the USSC's budget and that he is going to fund the USSC out of his Earthquake Program budget.

Pete asked the Commissioners if they were interested in having a joint meeting with our surrounding states. Bob answered that he already has a line item for that in his budget for next year.

Rick - Next meeting will be held on January 17, 2013 9:00 - 12:00.

Rick Allis adjourned the meeting at 12:00 PM.