

UTAH ADVISORY COMMITTEE FOR URBAN STRONG-MOTION MONITORING

Minutes of Teleconference

Monday, November 15, 2004 (3:00–4:45 pm MST)

The main purpose of this teleconference was to discuss and provide recommendations on an ANSS “needs statement” for Utah for FY2005, prepared and distributed earlier to the committee by the UUSS/ANSS Working Group.

Participants (Advisory Committee): Steve Bartlett (chair), Bob Carey, Gary Christianson, Marv Halling, Julie Ott, Larry Reaveley, Barry Welliver, Boyd Wheeler

Members Unable to Participate: Dave Marble, Peter McDonough, Chris Pantelides, Les Youd

Participants (UUSS/ANSS Working Group): Walter Arabasz, Relu Burlacu, Terry Dye, Kris Pankow, Jim Pechmann

Agenda

1. Welcome (Walter Arabasz, Steve Bartlett, chair)
2. Status of Utah’s urban strong-motion network (Kris Pankow and Terry Dye)
3. Other information updates (Kris Pankow)
4. Discussion and recommendations regarding Utah’s ANSS “needs statement,” distributed earlier (see Appendix G in <http://www.seis.utah.edu/anss/imw-needs.pdf>)
5. Other items committee may wish to discuss

1. Welcome (and introductory remarks)

Walter Arabasz proposed to facilitate agenda items 1–3 and then turn the lead over to Steve Bartlett for the remainder of the teleconference. Walter then described the impetus for the teleconference—the need for the University of Utah Seismograph Stations (UUSS) to submit a proposal for continuation funding to the U.S. Geological Survey (USGS) by December 1, 2004, for seismic network operations in FY2005. Any request for new ANSS instrumentation has to be endorsed by an ANSS regional and/or state-level advisory committee

Walter reported on the status of ANSS funding, which depends on pending Congressional decision-making. Funding for FY2005 is expected to be in the range of \$4.4 million to \$5.75 million. (Note: The subsequently approved FY2005 appropriation bill for the Department of Interior included \$5.25 million for ANSS, an increase of \$850,000 above the FY2004 level.)

The ANSS priorities for FY2005 set by the National Implementation Committee, as reported by Walter, are as follows:

- Priority 1 — Operation and Maintenance of the existing installed system
- Priority 2 — Progress on structural monitoring under ANSS
- Priority 3 — Development of Procedures and software to serve by Internet an ANSS National Catalog and Bulletin

- Priority 4 — Design of an ANSS Product Archiving & Distribution System
- Priority 5 — System software development and support

Given the above priorities, any funding for new instrumentation is likely to be very modest. Regarding structural monitoring, A draft *Guideline for ANSS Instrumentation of Engineered Civil Structures* is expected to be made available to the ANSS community by mid-December 2004. The USGS anticipates having a separate solicitation for structural instrumentation in Spring 2005. Larry Reaveley said that he was “in the loop” with the structural guidelines committee that was preparing the new guideline document.

Walter indicated a desire for two outcomes of the teleconference: first, comments by the committee on the UUSS/ANSS needs statement and, second, general feedback from the committee on structural monitoring.

2. Status of Utah’s urban strong-motion network

Kris Pankow reported that the Web pages for Utah’s urban strong-motion network have all been updated, except for County-specific maps (see <http://www.seis.utah.edu/urban/index.shtml>).

Terry Dye, the UUSS network engineer in charge of maintenance and operation of the strong-motion network, reported that the network now includes 75 ANSS-funded stations. Two stations were temporarily down. An ANSS REF TEK-130 accelerograph will be installed on the State Capitol grounds this week. Overall, the strong-motion network involves the following types of telemetry: ~ 1/3 digital radio, ~1/3 Internet, and ~ 1/3 frame-relay or DSL. Most of the stations with REF TEK accelerographs are now stable, despite earlier software problems. Terry talked about efforts to make the stations more reliable and to cut telemetry costs by eliminating frame-relay telephone lines with other forms of telemetry, especially DSL lines.

Walter commented that Utah did well to get 75 ANSS-funded strong-motion stations. Other areas, such as Nevada, have gotten fewer instruments to date.

3. Other information updates

Kris Pankow reported on developments in ShakeMap and ShakeCast. ShakeMap is progressing to be more user friendly and is now advancing to be sent to users via ShakeCast. (Note: ShakeCast—short for “ShakeMap Broadcast”—is a software tool designed to enable consumers of earthquake information, especially public-safety and emergency-response personnel, to automatically receive personalized earthquake information in a customized way using GIS technology, see <http://www.shakecast.org/pdf/ShakeCastIntroduction.pdf>).

UUSS is now running a new version of ShakeMap (v. 3.0) which can send information to a ShakeCast server. Utah users would then be able to install ShakeCast client software on their own computers. UUSS hopes to have a ShakeCast server with limited capacity to serve critical users locally. The limited capacity would require most local users to use national ShakeCast servers.

Walter noted that many of the developments in real-time earthquake information delivery are coming from the California Integrated Seismic Network (<http://www.cisn.org/>), which has state funding to meet public-safety needs of the California Office of Emergency Services for unified earthquake information statewide.

Kris mentioned another UUSS project, prompted by a request from Bob Carey on behalf of the Utah Division of Emergency Services and Homeland Security, that UUSS develop the capability to create ShakeMaps statewide throughout Utah. Based on lessons learned from the December 2002 San Simeon, California, earthquake, however, this will require more instrumental control outside the Wasatch Front area.

Walter briefed the committee on a teleconference held by the regional advisory committee for the ANSS Intermountain West (IMW) Region on November 12 (see http://www.seis.utah.edu/anss/notes_confcall12Nov04.pdf). The following recommendations emerged from the teleconference:

- the need for a coherent regionwide plan for seismic monitoring in the IMW Region
- helping “have not” networks and states in the IMW Region
- need for the availability of portable seismograph arrays to augment inadequate seismographic coverage in the IMW Region
- need to capture strong-motion data for large normal-faulting earthquakes, even if it means instrumenting areas with low population density
- need for USGS to continue refining and developing ShakeMap and ShakeCast
- need to convey the IMW perspective to the ANSS National Steering Committee—especially fundamental, first-order needs for seismic monitoring in the IMW

Insofar as the Utah strong-motion advisory committee appropriately advises on Utah’s state-level strong-motion needs, Walter summarized the FY2005 needs statement put forward by the UUSS/ANSS Working Group.

4. Discussion and recommendations regarding Utah’s ANSS “needs statement, distributed earlier (see Appendix G in <http://www.seis.utah.edu/anss/imw-needs.pdf>)

Three instrumentation needs identified in the Utah needs statement were (1) strong-motion stations outside the Wasatch Front area, (2) improved network coverage to meet ANSS performance standards, and (3) added strong-motion stations in and near the Wasatch Front Area (also to meet future ANSS performance standards). Item (1) was judged to be under the purview of the state-level advisory committee and was the primary focus of discussion as the highest-priority need listed by UUSS.

Larry Reaveley commented on the idea of filling in gaps in strong-motion coverage for both scientific purposes and because of population and economic impacts. He favors St. George as a good site for instrumentation because of its growing population and historical seismicity. Logan is also of concern in northern Utah. Marv Halling noted that there are now three (real-time) strong-motion instruments in Cache Valley, plus instruments to the west in and north of Brigham City.

Kris Pankow and Gary Christenson explained that the USGS National Strong-Motion Program (NSMP) currently operates strong-motion instruments in the following places in central and SW Utah, where UUSS doesn't have instruments: Santaquin, Nephi, Gunnison, Richfield, Beaver, Cedar City, and St. George. The NSMP operates Kinematics Etna accelerographs at three of these sites; older instruments at the four other sites can only record on-site and don't support telemetry. Kris described the possibility of a cooperative agreement with NSMP to upgrade these stations. The plan would be for USGS/NSMP to provide new Etna's for the sites that currently don't have them and for UUSS to provide the real-time telemetry.

Larry Reaveley suggested that the instruments should be sited at free-field sites near structures of interest (and/or a built environment). Steve Bartlett added that it's preferable to have them sited on a soft rock or stiff soil site (NEHRP class B or C)—close to the soil types in valley settings for which practitioners have to apply seismic building-code provisions. Gary Christianson noted that the NSMP sites cooperatively installed with the Utah Geological Survey were chosen to be representative of the ground conditions in the towns where they were located. Steve Bartlett agreed that was OK.

In response to a question from Jim Pechmann asking whether the committee supports upgrading all the NSMP stations described: Reaveley and Bartlett replied that they support upgrading all seven of the southern and central Utah NSMP stations, giving highest priority to stations in St. George, Cedar City, and Richfield because of their population density and historical seismicity. There was consensus that UUSS should request ANSS funding for the NSMP station upgrades to real-time telemetry. At the same time, it was judged that siting new strong-motion stations interior to the Colorado Plateau, such as near Vernal and Moab, was going to be a harder sell to ANSS because of the relatively lower hazard.

5. Other items (structural monitoring)

Steve Bartlett suggested that (1) it was premature to fully instrument any one structure in Utah until the ANSS guidelines are out and (2) some efforts should be made to instrument targets of opportunity such as the State Capitol and the Legacy Highway. Larry Reaveley has been advocating instrumenting the State Capitol—including interactions with Mehmet Celebi of the USGS. Because of tight budgets for the Capitol restoration project, Larry believes that funding for structural monitoring of the Capitol may only be possible with outside cooperative funding such as from ANSS. Marv Halling and Steve Bartlett are working on seeking UDOT funding for the Legacy Highway. Larry Reaveley asked whether such funding could be “backward fitted” into I-15 (that is, instrumenting not only new but also retrofitted highway bridge structures)?

Larry Reaveley identified four buildings in Utah that have base isolation: the Salt Lake City and County Building, a building owned by Evans and Sutherland Computer Corporation in the University of Utah Research Park, a Questar building in Salt Lake City, and the Valley Emergency Communications Center in West Valley City. Reaveley noted that Intermountain Health Care (IHC) is building a new hospital at the old Murray City smelter site with an upscale seismic bracing system (“buckling-restrained bracing”), and he suggested this building would be a good candidate for structural-monitoring instrumentation.

Given that California will likely be the most compelling place for ANSS structural monitoring, some thought has to be given to alternative or leveraged funding for instrumenting structures in Utah. Marv Halling agreed to develop such a plan for instrumenting buildings in Utah,

such as ones with base isolation or special seismic bracing—perhaps trying to get some funding from the building owners. Barry Welliver suggested seeking funding from the manufacturers of seismic performance systems—such as base isolators or bracing—to install instrumentation in buildings where such engineered systems have been installed. Reaveley suggested the potential of getting some funding from the Salt Lake Metropolitan Water District, which is spending about \$200 million for a water facility in Draper. Genevieve Atwood is on its board. Bartlett mentioned Questar as another possibility and suggested that the Utah Seismic Safety Commission's lifelines committee be involved in seeking partnering with utilities and other lifeline operators. Peter McDonough is on the USSC lifelines committee and has contacts with Questar. Williams Pipeline Company was mentioned as another utility to contact.

Barry Welliver suggested the need for a brochure to help make the sales pitch to building owners. Steve Bartlett volunteered to contact Norm Abrahamson in California about relevant materials. Reaveley added that Chris Rojahn of ATC might also be helpful in this regard, and he suggested that Hill Air Force Base also be considered as a possible funding source for instrumentation.

Walter suggested that the engineers on the committee put together a plan for structural monitoring in Utah after the ANSS guidelines come out at the end of 2004. Prospects for getting funding for structural monitoring in Utah are likely to depend on an attractive cost-sharing proposal to the national ANSS committee. UUSS is not likely to install and operate any structural-monitoring instrumentation on its own. Rather, it's more likely to be done by a national group. In any case, we all have to wait to see what the ANSS plan says when it's released.

The teleconference adjourned at 4:45 pm MST.

Minutes reported by Walter Arabasz, Jim Pechmann, and Kris Pankow