

February 17, 2000

TO: Mr. Ron Lynn, Chairman, Nevada Earthquake Safety Council
Board of Directors, Nevada Earthquake Safety Council

FROM: Jim Reagan, Chairman, Strategic Planning Committee

RE: Annual Report of activities for Plan Year 1999

I am pleased to provide you with a summary of activities and efforts achieved by the Standing Committees and members of the Nevada Earthquake Safety Council for the year 1999. In an organization such as this, where membership is derived from dedicated educators, scientists and professionals with a common interest, it is often difficult to measure the progress and successes that have been realized. As you review the attached committee reports, I'm sure you will agree that we are making substantial progress toward the Mission and Goals of the Council.

Executive Summary:

The attached pages provide detailed information of projects and accomplishments either complete or in progress. Highlights of these activities include another successful "Earthquake Awareness and Preparedness Week" and the production of 17,000 Earthquake Safety Calendars that were distributed to every classroom in the state of Nevada. Last year the Response and Recovery Committee outlined the development of Community Emergency Response Teams and they have successfully completed training of 19 trainers to begin working in the communities. Additionally, the Engineering and Architecture Committee communicated the Council's recommendations on the IBC 2000 to Nevada counties and local contractors. This committee, along with other council committee members, contributed to the success of the two workshops on "Seismic Safety of Existing Buildings" and HAZUS demonstrations. The Geoscience committee has demonstrated significant progress on numerous projects. Four programs in geologic hazard mapping are well underway along with a revised "Earthquake in Nevada" map and twenty new geologic maps for land use studies. Funding has been acquired to improve strong motion network in northern Nevada and expanding to southern Nevada. Two additional projects are underway to improve the statewide real-time earthquake monitoring system. Last year the council approved the restructuring of the Risk Assessment Committee to the Risk Mitigation Committee. Under new leadership, this committee is well underway with the "Living with Earthquakes" publication, a program to provide non-structural mitigation of the Red Cross facilities, and initiated an "Awards in Excellence" program for earthquake mitigation in the educational, public and private sectors.

Each of these committees has provided incremental progress toward our goals, but collectively, they have moved this council to a new level in earthquake awareness and safety in our state. Although many projects came to fruition this year, many more are ongoing or require several years to accomplish. The year 2000 Goal Summary for each Committee are also attached for your review. I would like to add my congratulations for the hard work of all council members.

NEVADA EARTHQUAKE SAFETY COUNCIL

STANDING COMMITTEE ANNUAL REPORT

ACTIVITIES IN PLAN YEAR 1999

GOAL A:

Increase earthquake awareness and education.

RESPONSIBILITY:

Awareness and Education Standing Committee

ACTIVITIES AND ACCOMPLISHMENTS FOR 1999 OBJECTIVES:

A-1. Inform general public about earthquakes hazards, safety, and risks.

- Earthquake Awareness and Preparedness Week
- Governor's Proclamation
- Public field trip to local faults
- Newspaper articles and interviews
- Milk Carton message (Earthquake Awareness and Preparedness Theme expanded)
- Earthquakes in Your Backyard Field Trip - Earth Science Week
- Seismo-Watch weekly updates
- Presentations / Talks / Tours / Interviews
- Web Site
- HAZUS Demonstrations
- Resource / Contact List (sponsors for calendar, poster contest and other activities)

A-2. Incorporate earthquake education in school curricula.

- Earthquake Awareness and Preparedness Week
- Governor's Proclamation
- Statewide Earthquake Drill

- ❑ Preparedness and Mitigation materials sent to schools statewide
- Copying donated by Nevada Bell
- Mailing donated by Sierra Pacific Power Company
- ❑ Poster Contest
- ❑ Certificates for county winners signed by governor
- ❑ Prizes donated by the Nevada Broadcasters Association
- ❑ Earthquake Safety Calendar 2000
- ❑ Over 17,000 calendars produced and delivered to teachers statewide.
- ❑ Mailing donated by Sierra Pacific Power Company
- ❑ School Demonstrations / Presentations / Talks / Tours
- ❑ Contact List
- ❑ Statewide list of public and private schools addresses and phone numbers

A-3. Facilitate development of continuing seismic hazard education programs for government and industry.

- ❑ Earthquake Awareness and Preparedness Week
- ❑ City of Sparks - Project Impact supported for calendar and other publications.

NEVADA EARTHQUAKE SAFETY COUNCIL

STANDING COMMITTEE ANNUAL REPORT

ACTIVITIES IN PLAN YEAR 1999

GOAL B:

Improve emergency management, response and recovery systems.

RESPONSIBILITY:

Response and Recovery Standing Committee

ACTIVITIES AND ACCOMPLISHMENTS FOR 1998 OBJECTIVES:

B-1 Improve the Integrated Emergency Management System statewide

- Participated in "Substantial Damage Estimator Workshop" offered by FEMA Disaster Field Office in Las Vegas.
- Participated in "Workshop on Seismic Safety of Existing Buildings"

B-2 Encourage development of coordinated communication systems for integrated response and recovery systems statewide

- Participated in coordinated communication system for Y2K which has been adopted for ongoing response and recovery for all hazards. (B-2)

B-3 Encourage the development of Community (or Neighborhood) Emergency Response Teams (CERT or NERT) to enhance citizen preparedness and survival in earthquake prone communities.

- Conducted 3-day CERT Train-the-Trainer course in Carson City. 19 participants.
- Conducted briefing for NESC on Community Emergency Response Teams.

B-6 Encourage use of Incident Command System for local governments, public safety agencies, business and industry, hospital facilities and non-profit agencies

- Participated in ICS courses in southern Nevada in preparation for Y2K which transfers easily to all hazards for response and recovery. (B-6)

NEVADA EARTHQUAKE SAFETY COUNCIL

STANDING COMMITTEE ANNUAL REPORT

ACTIVITIES IN PLAN YEAR 1999

GOAL C:

Improve seismic safety of buildings and infrastructure.

RESPONSIBILITY:

Engineering and Architecture Standing Committee

ACTIVITIES AND ACCOMPLISHMENTS FOR 1997 OBJECTIVES:

C-1 Encourage state and local agencies to adopt building codes and design standards that incorporate the most recent seismic requirements.

□ George Ghush presented the Council's proposed changes to the International Building Code (IBC) 2000 to the Nevada counties and to the Northern Nevada Association of General Contractors. George also presented information on how design force figures change with the new codes (1994, 1997, and 2000).

C-6 Improve seismic safety for; older public school buildings and historic buildings, operational ability of older hospital buildings, older high-occupancy buildings (250 persons or more), older residential structures or mobile homes.

□ Engineering and Architecture solicited several attendees to the "Seismic Evaluation of Existing Buildings" workshop by Diana Todd, and the HAZUS demonstration by Jawhar Bouabid. This event was strongly attended by engineering professionals in both the north and south presentations.

NEVADA EARTHQUAKE SAFETY COUNCIL

STANDING COMMITTEE ANNUAL REPORT

ACTIVITIES IN PLAN YEAR 1999

GOAL D:

Improve essential geoscience information.

RESPONSIBILITY:

Geoscience Standing Committee

ACTIVITIES AND ACCOMPLISHMENTS FOR 1999 OBJECTIVES:

D-2 Reduce earthquake losses by mapping and identifying geologic hazards. (O)

□ The Nevada Bureau of Mines and Geology and the Seismological Laboratory continued to conduct research and monitoring programs designed to reduce earthquake losses in Nevada. These programs were funded from various sources including the National Earthquake Hazard Reduction Program, the U.S. Department of Energy Yucca Mountain Program, and the U.S. Geological Survey STATEMAP Program.

□ The Nevada Seismological Laboratory continued studies of earthquake epicenters, focal mechanisms, aftershocks of specific faults in Nevada (including the Lake Tahoe area, the Scotty's Junction, Nevada area, and Double Springs, Nevada). The relationship between moderate and major faults is a particular focus at this time. The strong ground motion response in Las Vegas Valley from the Scotty's Junction and Hector Mine, California earthquakes is the subject of ongoing research. Probabilistic seismic hazard is also being improved.

□ During 1999, staff members from the Department of Geological Sciences (UNR) and the Nevada Seismological Laboratory continued studies of Quaternary and Holocene paleoseismic faults, large landslides, and historic earthquakes (including the October, 30, 1988 earthquake) in the Lake Tahoe region.

□ During 1999, the potential tsunami from of a large earthquake bounding Lake Tahoe was investigated. Potential wave heights around the lake margins range up to 10 meters, so a simple recommendation to anyone living in the vicinity of the lake is to immediately seek high ground (at least 10 meters above lake level) if they feel a severe earthquake.

D-3 Develop and support the implementation of a criteria for performance of geologic-hazards investigations.

□ Revision of the "Guidelines for Evaluating Potential Surface Fault Rupture/Land Subsidence Hazards in Nevada" was completed, and placed on the NESC and NBMG Web sites.

□ The "Guidelines for Evaluating Liquefaction Hazards in Nevada" was completed, placed on the NESC Web site on the NBMG Web (www.nbmг.unr.edu/nesc/index.html), and recommended for approval by the NESC at the February 18, 2000 meeting.

(Geoscience Committee – Continued)

- The Nevada Bureau of Mines and Geology (NBMG) in 1999 published an updated earthquake epicenter map for Nevada, NBMG Map 119, which was co-authored by Diane M. dePolo of the Nevada Seismological Laboratory and Craig dePolo of NBMG, titled "Earthquakes in Nevada, 1952-1998". The 1:1,000,000-scale map plotted on a shaded relief base map, with an inset map that shows major earthquakes in Nevada and surrounding areas, a table of earthquake data for earthquakes of $M > 5.5$, and a text. This map will be a major resource for future earthquake hazard studies and planning in Nevada.

- In 1999 NBMG also published twenty new geologic maps, mostly at 1:24,000-scale. These geologic maps form the basis for hazard studies that are useful in land-use planning and risk mitigation. Any of the maps delineate areas that, upon further analysis, may prove to be hazardous in terms of ground shaking or liquefaction. They include 4 in the Las Vegas/Pahrump region, 3 in the Reno/Carson City area, and 13 distributed through the state in rural areas.

D-4 Incorporate seismic hazards in development and/or modification of land use planning policies through local government ordinances.

- Detailed review of the IBC 2000 document and development of recommendations for appropriate hazard maps Nevada. Develop a consensus among the geoscience and engineering communities on appropriate levels of seismic hazard and seismic design, particularly in the Western Nevada region.

- The review of the IBC 2000 probabilistic maps was completed. The recent NEHRP map shows a higher earthquake hazard than was previously recognized in some areas, and may require reactivation of these activities by the Geoscience Committee.

D-5. Develop, incrementally, a strong-motion program throughout the state.

- The Seismo Lab has received state funding to supplement the strong motion network to achieve a thorough understanding of strong ground motion in the urban areas of Nevada. Five strong motion instruments were installed in Reno/Sparks/Carson City area. We also have purchased three instruments to be installed in Las Vegas.

- The Seismo Lab expanded its seismic network in southern Nevada. We are now operating two stations outside of Las Vegas, with a third station waiting permitting from the BLM. These three stations, while sparse, are three-component digital stations that will give the optimal coverage for minimal cost in the Las Vegas region. Las Vegas is outside any area for which the Seismo Lab has funding for operating seismic networks. Equipment funds are relatively easily obtained, and the operations will be continued so long as funds are available.

D-6. Develop a statewide, real-time, earthquake monitoring system.

- The Seismo Lab is in the process of adapting a new operating system that will improve its real-time capabilities to locate and report earthquakes. The new software, called Antelope, combines the data stream from northern and southern Nevada into a single data stream, and thus results in improved locations especially on the margins of the northern and southern networks.

- The Seismo Lab expanded its analog seismic network in the western Nevada region to give better coverage of the area north of Truckee California where there have been large numbers of small earthquakes lately. Western Nevada is affected by earthquakes in this area just west of the California border, and the area was not covered by any other seismic networks.

(Geoscience Committee – Continued)

OTHER ACTIVITIES NOT INCLUDED IN 1999 OBJECTIVES:

- NESC council members and participants in the council activities, faculty at UNR and UNLV, staffs of the Nevada Bureau of Mines and Geology and Nevada Seismological Laboratory have continued to interact with the media, particularly after earthquakes were felt in various parts of the state.
- Several interviews were made on TV stations, help was provided to journalists, and talks were presented to service organizations.
- FEMA made a special grant to up-grade the seismographic station at UNLV.

NEVADA EARTHQUAKE SAFETY COUNCIL

STANDING COMMITTEE ANNUAL REPORT

ACTIVITIES IN PLAN YEAR 1999

GOAL E:

Promote the mitigation of earthquake risks resulting in increased safety for the citizens of and visitors to Nevada.

RESPONSIBILITY:

Risk Mitigation Committee

ACTIVITIES AND ACCOMPLISHMENTS FOR 1999 OBJECTIVES:

F-1 Participate in producing "Living with Earthquakes"

- Submitted initial and secondary draft and managing production of special publication

F-2 Award in Excellence for Earthquake Risk Mitigation

- Solicited candidates for award
- Single award for 1999 to Nevada Department of Transportation

F-3 Writing of the *Nevada Earthquake Risk Mitigation Plan*

- Completed drafts of the Nevada Earthquake Risk Mitigation Plan and submitted it to the Nevada Division of Emergency Management for review in January of 2000.
- Presenting Risk Mitigation Plan to Nevada Earthquake Safety Council for review.

F-4 Promote nonstructural mitigation

- Participated in presentations to local groups including Douglas County School District
- EQ Safety Week promotion with milk carton labels contained nonstructural mitigation message

F-5 Mitigation of Red Cross Headquarters

- In the process of securing Project Impact grant.

OTHER ACTIVITIES NOT INCLUDED IN 1999 OBJECTIVES:

- Sponsored Diana Todd's workshop, initiating the idea, drafting the initial letter, and coordinating with the Association of Engineering Geologists for the evening meeting.

STRATEGIC PLAN
FOR
EARTHQUAKE SAFETY IN NEVADA
GOAL SUMMARY
GOALS FOR PLAN YEAR 2000

GOAL A:

Increase earthquake awareness and education.

STRATEGY:

Identify distinct target populations and develop strategies, communication methods and programs that will optimize the education and awareness efforts for each target. Identify grant sources and regenerating revenue methods to support annual projects such as Earthquake Awareness Week, drills, calendar, and poster contest. Develop a resource and contact list that can be easily updated, for use by the council, standing committees, and educators in the state. Expand membership and participation in education and awareness projects and efforts.

RESPONSIBILITY:

Awareness and Education Standing Committee

OBJECTIVES: (Annual Events - A Ongoing Activity - O)

A-1 Inform general public about earthquake hazards, safety and risks

- Resource / Contact List (O)
- Emergency Management / Preparedness Courses (O)
- SEISMO-WATCH (O)
- Web Site (O)
- Talks / Tours / Presentations (O)
- Earthquake Awareness & Preparedness Week (A)
- Calendar (A)

A-2 Incorporate earthquake education in school curricula

- Resource / Contact List (O)

- School Demonstrations / Presentations / Talks / Tours (O)
- Earthquake Awareness Week (A)

Statewide Earthquake Drill (A)

Statewide Poster Contest (A)

Calendar (A)

- Preparedness Guide for School (Caughlin Ranch Model) (1998/99)

A-3 Facilitate development of continuing seismic hazard education programs for government and industry

- Project Impact (1998/99)
- Earthquake Awareness & Preparedness Week (A)
- Commercial / Industrial Safety (O)

STRATEGIC PLAN
FOR
EARTHQUAKE SAFETY IN NEVADA
GOAL SUMMARY
GOALS FOR PLAN YEAR 2000

GOAL B:

Improve emergency management, response and recovery systems.

STRATEGY:

Integrate the existing emergency management system at all levels of the government and the private sector, and conduct training and exercises to accomplish an effective level of readiness for the protection of life, health, property and the environment during and after an earthquake.

RESPONSIBILITY:

Response and Recovery Standing Committee

OBJECTIVES: (Annual Events - A Ongoing Activity - O)

B-1 Improve the Integrated Emergency Management System statewide (O)

B-2 Encourage development of coordinated communication systems for integrated response and recovery systems statewide (O)

B-3 Encourage the development of Community (or Neighborhood) Emergency Response Teams (CERT or NERT) to enhance citizen preparedness and survival in earthquake prone communities. (O)

B-4 Develop exercises or workshops based upon Western Nevada Earthquake Planning Scenario, for government agencies and inform business/industry and private citizens (A)

B-5 Encourage Mutual Aid and Inter-Local agreements to facilitate resource availability and deployment to support response and recovery during a seismic event. (O)

B-6 Encourage use of Incident Command System for local governments, public safety agencies, business and industry, hospital facilities and non-profit agencies (O)

STRATEGIC PLAN
FOR
EARTHQUAKE SAFETY IN NEVADA
GOAL SUMMARY
GOALS FOR PLAN YEAR 2000

GOAL C:

Improve seismic safety of buildings and infrastructure.

STRATEGY:

Utilize the most recent geoscience information to develop geotechnical criteria for enhancing the safety of existing and future buildings and infrastructure including retrofit to meet seismic requirements, and to make land use compatible with known seismic hazards. Secure funding mechanism for implementation.

RESPONSIBILITY:

Engineering and Architecture Standing Committee

C-1 Encourage state and local agencies to adopt building codes and design standards that incorporate the most recent seismic requirements. (O)

- Provide the desired regulatory process for the adopted codes and standards.

C-2 Reduce earthquake-induced liquefaction risk to highway structures, airports, and other community infrastructure systems. (O)

C-3 Improve plan review procedures on new construction to ensure that buildings are designed in accordance with current seismic code requirements. (O)

C-4 Improve the post-earthquake operational status of essential service buildings. (O)

C-5 Reduce seismic structural and nonstructural hazards in government-owned and leased buildings. (O)

C-6 Improve seismic safety for; (O)

- older public school buildings and historic buildings
- operational ability of older hospital buildings
- older high-occupancy buildings (250 persons or more)

- older residential structures
- mobile homes

C-7 Evaluate survivability, in the event of an earthquake, for; (O)

- lifeline utility-essential services
- water and waste-water systems

C-8 Improve the seismic safety and design of hazardous materials usage, storage, and transportation facilities. (O)

STRATEGIC PLAN
FOR
EARTHQUAKE SAFETY IN NEVADA
GOAL SUMMARY
GOALS FOR PLAN YEAR 2000

GOAL D:

Improve essential geoscience information.

STRATEGY:

Develop geoscience information and research required to enhance the safety of buildings and infrastructure including retrofit to meet seismic requirements, and to make land use compatible with known seismic hazards. Ensure that the best contemporary information is available to facilitate making informed decisions about seismic risk reduction. Secure funding mechanism for implementation.

RESPONSIBILITY:

Geoscience Standing Committee

OBJECTIVES: (Annual Events - A Ongoing Activity - O)

- D-1 Develop and implement a research and monitoring plan for seismic activities in the state. (O)
- D-2 Reduce earthquake losses by mapping and identifying geologic hazards. (O)
- D-3 Develop and support the implementation of a criteria for performance of geologic-hazards investigations. (O)
- D-4 Incorporate seismic hazards in development and/or modification of land use planning policies through local government ordinances. (O)
- D-5 Develop,, incrementally, a strong-motion program throughout the state. (O)
- D-6 Develop a statewide, real-time earthquake monitoring system. (O)
- D-7 Monitor faults using Global Positioning System (GPS) measurements. (O)
- D-8 Determine expected magnitude and frequency of return of various size earthquakes on known fault systems. (O)
- D-9 Develop "Guidelines for Evaluating Liquefaction Potential in Nevada" (O)

STRATEGIC PLAN
FOR
EARTHQUAKE SAFETY IN NEVADA
GOAL SUMMARY
GOALS FOR PLAN YEAR 2000

GOAL E:

Promote the mitigation of earthquake risks resulting in increased safety for the citizens of and visitors to Nevada.

STRATEGY:

Empower Nevadans with common-sense ideas about earthquake risk mitigation utilizing information mediums (pamphlet, newspaper, internet, television, radio) on earthquake risk mitigation, with a special emphasis on nonstructural mitigation. Seek funding for showcase mitigation projects. Develop an Awards in Excellence in Earthquake Risk Mitigation project that annually awards certificates of commendation from the NESC during Earthquake Awareness and Preparedness Week; this will highlight mitigation projects in a relatable way to Nevadans. Promote planning communities around earthquake hazards by providing information, and supporting hazard delineation and presentation in usable formats. Encourage earthquake-resistant infrastructures and lifelines through promoting information and participating in utility working groups.

RESPONSIBILITY:

Earthquake Risk Mitigation Committee

OBJECTIVES:

E-1 Participate in the production of "Living with earthquakes in Nevada" injecting mitigation information. (A)

E-2 Create an Awards in Excellence for Earthquake Risk Mitigation in Nevada for Earthquake Awareness and Preparedness Week 2000 then annually. (O)

E3 Write and maintain the *Nevada Earthquake Risk Mitigation Plan*.

E-4 Promote nonstructural mitigation. (O)

E-5 Participate in the earthquake risk mitigation project for the Red Cross building in Reno.

- Document retrofit with photographs and videos.
- Seek end-of-year, disaster fund, or other funding to support mitigation.

- Expand project to Red Cross chapters in Las Vegas and Elko.