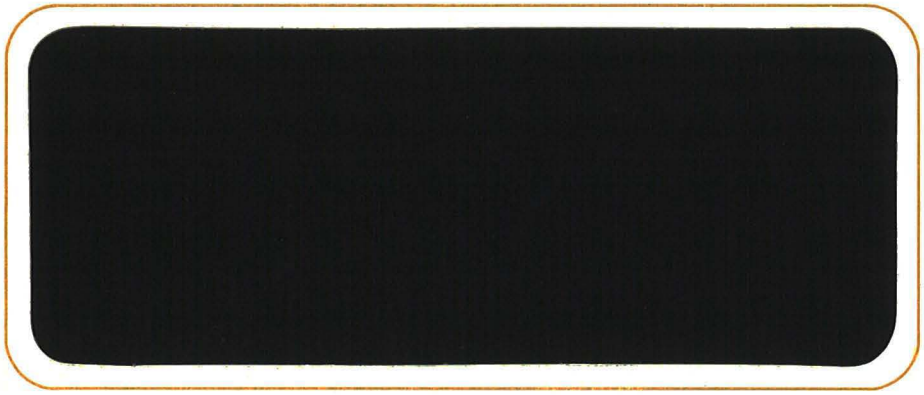

SEISMIC SAFETY ADVISORY COUNCIL

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EMERGENCY MANAGEMENT PLANNING FOR EARTHQUAKE DISASTERS IN UTAH

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SEISMIC SAFETY ADVISORY COUNCIL
STATE OF UTAH

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SECTION 1

INTRODUCTION

This report is one of a series of studies by the Utah Seismic Safety Advisory Council, undertaken in response to direction by the 1977 legislature that the Council advise the Governor, Legislature, and State and Local governments on policies and actions to reduce earthquake risks in Utah. This study analyzes and comments on programs that emergency management operations of government should employ to reduce loss of life and property in an earthquake and to provide effective response to damaging earthquake events.

Some of the programs recommended are closely related to the existing Emergency Operations Plan (EOP), Volume II, "Natural Disasters, State of Utah" (Cf. [8]). Others of the programs are new or are recommendations for increased levels of effort in order to meet the objectives to reduce present earthquake risk, to prevent creation of future risk, and to develop the readiness and capability of public and private agencies and individuals to respond to earthquakes. In general, the programs are equally appropriate for application at the state level or by local governments, although some specific program recommendations may be applied more appropriately by one particular level of government to achieve improved effectiveness or efficiency.

Four major components of comprehensive emergency management for seismic safety are considered in this report: mitigation, preparedness, response, and recovery. The purpose of the report is to identify appropriate programs and actions to reduce seismic risk within each of the components. No attempt has been made to evaluate the success of current Utah Division of Comprehensive Emergency Management (CEM) seismic safety efforts contained in the EOP Volume II, or to evaluate similar programs that may be operated by local governments. However, it is recognized that the seismic safety programs recommended are closely related to CEM activities, since that agency has responsibility to prepare for all disasters, including earthquakes. Also, this report does not address the matter of budget and staffing within CEM and other agencies which would be needed to carry out the recommended programs in an effective manner. The recommendations are those which the Seismic Safety Advisory Council considers a reasonable and attainable set of earthquake safety programs and objectives to guide State and local government efforts during the next few years.

Recent legislative and executive actions at the federal government level will influence to a large degree the priorities and programs of the Utah CEM agency and, consequently, of local governments during the next few years, particularly in the area of earthquake safety. The United States Congress enacted Public Law 95-124 on October 7, 1977, (Cf. [1]) known as the "Earthquake Hazards Reduction Act." The purpose of the Act, as stated in Section 3, is as follows.

> "It is the purpose of the Congress in this Act to reduce the risks of life and property from future earthquakes in the United States through the establishment and maintenance of an effective

earthquake hazards reduction program."

In accordance with policies set forth in the Act, the Executive Office of the President has taken the following actions.

(1) The Office of Science and Technology Policy has prepared and published "The National Earthquake Hazards Reduction Program" (Cf. [2]) in which guiding principles and priorities for immediate action in the nation are set forth.

(2) By Executive Order 12148, July 20, 1979, a number of disaster-related federal agencies were consolidated into a single Federal Emergency Management Agency (FEMA). In the Order, the FEMA director is charged to work with State and local governments and the private sector to bring about participation in civil emergency preparedness, mitigation, response, and recovery programs.

SECTION 2

FOUR PHASES OF COMPREHENSIVE EMERGENCY MANAGEMENT

Source: National Governors' Association Emergency Management Project.

In past years, emergency service agencies throughout the nation and in Utah have focused on preparedness and response programs as an outgrowth of orientation based on civil defense allocations and programs. Within the past few years, a new concept of comprehensive emergency management has evolved, partly from a study conducted by the National Governors' Association, and partly from a broader perspective of emergency management perceived by the federal government. This new concept includes mitigation and recovery as co-equal elements (with preparation and response) of a balanced approach to emergency preparedness. The following summarizes the four phases of the model that has been developed.

- MITIGATION (Long-Term)

Definition: Any activities which actually eliminate or reduce the probability of occurrence of a disaster. It also includes long-term activities which reduce the effects of unavoidable disasters.

General Measures:

Building codes
Vulnerability analyses updates
Tax incentives/disincentives
Zoning and land-use management
Building-use regulations/safety codes
Compliance and enforcement
Resource allocation/interstate sharing
Preventive health-care
Public education

- PREPAREDNESS (To Respond)

Definition: Preparedness activities are necessary to the extent that mitigation measures have not or cannot prevent disasters. In the preparedness phase, govenments, organizations, and individuals develop plans to save lives and minimize disaster damage. Preparedness measures also seek to enhance disaster response operations.

General Measures:

Preparedness plans
Emergency exercise/training
Warning systems

Emergency communications systems
Evacuation preparation
Resource inventories
Emergency personnel/contact lists
Mutual-aid agreements
Public information/education

- RESPONSE (To Emergency)

Definition: Response activities follow an emergency or disaster. Generally they are designed to provide emergency assistance for casualties. They also seek to reduce the probability of secondary damage and to speed recovery operations.

General Measures:

Activate public warning
Notify public authorities
Mobilize emergency personnel/equipment
Evacuate
Emergency medical assistance
Man operations centers
Declare disaster
Mobilize security forces
Search and rescue
Debris removal
Emergency suspension of laws
Inventory and evaluate damage (damage assessment)

- RECOVERY

Definition: Recovery continues until all systems return to normal or better. Short-term recovery returns vital life-support systems to minimum operating standards. Long-term recovery may continue for a number of years after the disaster. Their purpose is to return life to normal or improved levels.

General Measures:

Damage insurance
Loans and grants
Temporary housing
Long-term medical care
Disaster unemployment insurance
Public information
Health and safety education
Reconstruction and area rehabilitation
Counselling programs
Economic impact studies
Redevelopment planning to reduce future earthquake risk

An important aspect of this four-phased model is that mitigation is given

equal emphasis with other traditional emergency services. This newly placed emphasis creates new kinds of management responsibilities while simultaneously it establishes the framework for more effective long-term management of disasters to reduce life, property, and economic losses. Special note is made of mitigation as a tool of emergency management, because earthquake disasters are most effectively dealt with through such measures.

This emphasis upon mitigation measures for earthquake preparedness is not to be interpreted as overshadowing the importance of the other three phases of comprehensive emergency management. Preparedness, response, and recovery also are extremely important functions in any earthquake or other type of disaster, and in this report we have given them equal consideration in terms of programs relevant to earthquake hazards reduction.

SECTION 3

MITIGATION PROGRAMS IN UTAH

EARTHQUAKE MITIGATION RESPONSIBILITIES OF THE UTAH DIVISION OF COMPRHENSIVE EMERGENCY MANAGEMENT

Background

The Federal Disaster Relief Act of 1974 (Public Law 93-288) stated the intent of Congress as follows: "encouraging hazard mitigation measures to reduce losses from disasters, including development of land use and construction regulations." On December 10, 1979, subpart M (44CFR205) became effective, establishing mitigation. The rules indicate that the Utah CEM Division will be involved in hazard mitigation activities which are associated with federal financial and other support following disaster declarations by the President under Public Law 93-288.

In response to these rules and their perception of the problem, the Utah CEM Division prepared, issued, and placed into effect a guideline document titled "State of Utah 'Major Disaster' or 'Emergency' Hazard Evaluation and Mitigation Planning Program Guide," dated May, 1980, (Cf. [7]). The guide outlines responsibilities and program actions to be taken by the CEM Division for various types of disasters. Earthquake mitigation is not treated separately in the guide, but rather, is encompassed in a more general way through programs appropriate to a range of disaster types. Even so, the Utah Seismic Safety Advisory Council believes this is an important first step in mitigation of earthquake disasters in Utah and commends CEM for this excellent planning guide. It will be useful to State and local agencies in Utah.

Owing to the fact that earthquakes pose a significant risk in Utah (Cf. [11]), possibly the major life safety risk, the Utah Seismic Safety Advisory Council recommends that more specific consideration be given to earthquake hazards mitigation than is found in the CEM guideline referenced above. The extent of earthquake hazards in the State is ample reason for separate consideration. Particular recommendations to accomplish a more intensive focus upon earthquake mitigation are indicated below.

Recommendations

1. CEM should add a section on earthquake mitigation to the State of Utah Emergency Operations Plan, Volume II, Natural Disasters. In preparing this mitigation section, CEM should continue to work closely with State and local agencies that have expertise and responsibility in this area, including the following: Utah Geological and Mineral Survey, State Planning Coordinator, State Building Board, Department of Health, State Board of Education, and local planning agencies.

2. CEM should encourage or require, as appropriate, the preparation of

earthquake disaster mitigation plans for State and local governments prior to an earthquake disaster. The Federal Rules and the State of Utah Planning Guide provide for preparation of hazard mitigation plans after a Presidential declaration of an "Emergency" or "Major Disaster." In regard to natural hazards generally and earthquake hazards in particular, it is believed that present hazard levels could be reduced and prevention of future hazards accomplished through hazard mitigation measures such as building codes, vulnerability analysis, land-use plans, zoning regulations, building-use regulations, and safety codes.

3. The Utah CEM Division should prepare materials and present seminars for local officials on local earthquake hazard mitigation responsibilities and procedures for using the Hazard Evaluation and Mitigation Planning Program Guide.

4. Local emergency management offices should be encouraged to designate and train a hazard mitigation coordinator as part of the local staff. This person could assist in preparation of the local earthquake disaster mitigation plan mentioned in recommendation 2.

PUBLIC INFORMATION ON EARTHQUAKES

Background

Effective public information can lead to individual and family actions that will reduce or avoid losses when an earthquake occurs. Public information is the means to encourage individuals to prepare for earthquakes by developing educational materials and by training organizations to develop public information plans. When an earthquake occurs, emergency public information is vital in informing the public about what has happened and advising it on steps to take to avoid further risk and injury. During the recovery phase, public information is needed to advise people about available assistance and to advise on action to mitigate losses from future disasters. Public information programs are among the least costly and most effective earthquake hazards mitigation programs available to the State and local governments.

Annex G of the Utah Emergency Operations Plan, Volume II, sets forth the concept of operations and functional responsibilities for emergency public information during a natural disaster situation. This plan recognizes the importance of public information and establishes operational concepts for such a program. Specific public information on earthquakes should be developed and used to supplement Annex G of the operations plan.

Recommendations

5. An "Earthquake Survival Guide" for the general public should be prepared and published. This document should deal with topics such as earthquake emergency actions and first-aid techniques. It would be convenient and useful to have this survival guide published in the telephone directories in Utah. Public service announcements informing the public about the survival guide should be prepared and

used.

6. Many different agencies, both public and private, will utilitize an emergency public information system in the event a disaster occurs. The CEM Division should take the lead in forming a public information advisory committee to coordinate efforts and develop materials by federal, State, local, and private agencies.

7. CEM and other agencies concerned with earthquake hazards should continue to work toward annual designation of a statewide "Earthquake Preparedness Day" or week. This could provide a yearly means to focus attention in businesses, schools, the media, and the public to earthquake hazards and to disseminate information and guidance on the subject.

8. The heaviest demand by the public for earthquake information material will be immediately after an earthquake. At this time, emergency management staffs will be least able to prepare material for distribution. Therefore, camera-ready material and information packets for both print and broadcast media should be prepared ahead of time and stockpiled for distribution immediately after an earthquake. This may include such items as: Map of earthquake faults in Utah, explanation of seismology in Utah, what to expect after an earthquake, survival and self-protection measures, reference to the telephone book survival guide, a review of federal and State disaster relief programs, and practical tips on techniques to reduce earthquake damage.

9. An earthquake speakers bureau should be established through which knowledgeable individuals willing to speak on earthquake subjects may be scheduled. Public information presentations should be prepared and made available to those who speak on earthquake topics. These could include scripts, slides, and other graphics, and should cover both technical matters and practical protective measures for all citizens.

10. Educational and informational materials should be developed on individual emergency preparedness actions the public may take to prepare for a disastrous earthquake.

SECTION 4

PREPAREDNESS PROGRAMS IN UTAH

EARTHQUAKE PLANNING

Background

The ultimate goal of all State of Utah seismic safety policies and programs is to reduce life and property loss in an earthquake. The Preparedness component of earthquake disaster planning emphasizes development of the readiness and capability of public and private agencies to respond to earthquakes.

In a report on seismic safety programs in California (June 1977), the California Seismic Safety Commission stated the following concerning preparedness: "There is general consensus among those who deal with earthquake problems in California that in the short term (within the next ten or fifteen years) disaster preparedness can provide the greatest degree of hazard mitigation, in terms of lives saved, than any other mitigation measure. However, disaster preparedness has the smallest budgetary support of any of the six areas in which the State funds seismic safety programs." The Utah Seismic Safety Advisory Council agrees with this emphasis on preparedness and recommends consideration of the following programs for earthquake preparedness.

Recommendations

1. The Utah CEM Division should prepare an earthquake response plan which would be a part of and subordinate to the State of Utah Emergency Operations Plan, Volume II, Natural Disasters. This would provide for a more specific response to an earthquake disaster and should include specific response elements. CEM also should provide guidance and assistance to local emergency management agencies in preparing local earthquake response plans.

2. Many public schools in Utah are especially vulnerable to structural damage and casualties during an earthquake. CEM, in cooperation with the Utah Board of Education, should continue to engage in training programs to insure that teachers and children know how to respond if an earthquake occurs. Earthquake disaster drills conducted on a regular basis are recommended as part of the school preparedness program.

3. The basic Emergency Operations Plan for Natural Disasters in Utah is primarily an organizational plan. CEM should supplement the basic plan by preparing prototype checklists, standard operating procedures, and contingency plans to be used for an earthquake disaster. Such checklists and procedures supplement the basic plan and would be useful in an actual emergency, especially for local government emergency agencies.

4. High-risk structures and facilities should be identified so emergency response time is reduced.

5. Inundation zones resulting from potential earthquake-induced dam failures should be mapped and plans developed to meet this hazard.

EARTHQUAKE PREDICTION RESPONSE

Background

During the past decade, and continuing at the present time, research is being conducted on the problems associated with scientific earthquake prediction. The current state of the art is not considered to be perfected to the point of accurate prediction of earthquakes, particularly in Utah. However, reputable scientists believe that within ten to twenty years it may be possible to accurately predict at least some earthquakes. In the event that earthquake prediction is developed to such a point, it will be essential for State and local governments to respond to such validated earthquake predictions. This response will be effective only if governmental agencies and the public are informed about the significance and limitations of those predictions, and if information is made available about appropriate response actions.

Recommendations

6. The State and local governments should begin preparations to respond to scientific earthquake predictions by forming an Earthquake Prediction Evaluation Council to advise the director of CEM on the scientific validity of predictions of earthquakes capable of causing damage in Utah. This Council should prepare earthquake prediction evaluation guidelines.

7. CEM should prepare and publish an earthquake prediction response plan for use by State agencies and local governments. This prediction response plan may be a part of the earthquake response plan in recommendation 1 of Earthquake Planning. The earthquake prediction response plan may include the following elements: (a) preparatory actions appropriate to the interval between an earthquake prediction and the event itself, (b) specific details on the process for evaluating earthquake predictions, (c) the procedure for disseminating warnings, (d) the readying of emergency services to cope with any post-earthquake conditions, (e) pre-earthquake mitigation activities which would be appropriate to the prediction.

8. In the Wasatch Front area of high earthquake risk, local government agencies should be encouraged to develop their own local prediction response plans.

9. CEM should develop an earthquake prediction scenario for use in earthquake prediction exercises to be conducted in areas of high risk.

10. Model earthquake mitigation ordinances should be prepared for hazardous

buildings and other dangers that may be used by local governments in event of a validated earthquake prediction.

TRAINING AND EDUCATION

Background

Training and education in earthquake safety covers a wide variety of activities and programs. These include seminars to provide specific instruction to emergency management personnel, simulation tests of emergency plans, and public education courses at schools to acquaint the public with earthquake safety issues. CEM sponsors such training and education programs for general emergency preparedness. There appears to be a need in the high earthquake risk area of Utah (Wasatch Front) to conduct such training with specific orientation to earthquake safety.

Recommendations

11. State agency earthquake emergency exercises should be scheduled. These exercises should include county emergency services agencies of the Wasatch Front. These exercises should include such elements as public works, heavy rescue, fire, and medical services.

12. CEM should develop training programs to prepare for the recovery period after a disastrous earthquake. Exercises typically concentrate on the immediate post-disaster response period. Post-earthquake and long-term disaster recovery operations also should receive attention, particularly from local emergency services agencies.

13. The private sector should be more directly involved in earthquake disaster preparedness. Plans for mobilization of private equipment for heavy rescue and debris clearance should be considered. Earthquake response plans for selected large businesses and industry also should be considered.

SECTION 5

RESPONSE CAPABILITY IN UTAH

HEAVY RESCUE

Background

Heavy rescue refers to rescue activities that require specialized construction equipment to respond to damage caused by a strong earthquake. This damage primarily would involve collapsed structures in which people may be trapped and would demand prompt heavy-rescue response efforts. There are large numbers of buildings in the Wasatch Front area which are of unreinforced masonry or other types of construction vulnerable to earthquakes. In a postulated earthquake of magnitude 7.5 affecting the Wasatch Front urban area, many buildings would collapse or be damaged to the extent requiring heavy equipment to rescue persons trapped in the buildings.

Current capability for heavy rescue in Utah relies primarily on private sector resources. While cooperation and committment of heavy equipment on the part of private contractors is essential and of great value, the private sector may not be adequate to carry the total heavy-rescue burden imposed by a disastrous earthquake. Some factors to consider when depending upon private sector equipment for heavy-rescue use are:

(a) Communications systems for alerting heavy-rescue equipment owners.

(b) Appropriate equipment may not be available at all within a reasonable distance of where it is needed.

(c) Private sector equipment usually does not include specialized rescue tools such as air cushions and "Jaws of Life."

(d) Agreements for use of private equipment are not binding upon the owners, and contingency plans may be necessary.

(e) Waivers of public liability or other arrangements may be necessary to provide legal protection for private sector participation in heavy-rescue operations.

Recommendations

1. Local emergency services agencies should plan for and develop a heavy-rescue capability and readiness program for the Wasatch Front and other densely populated areas in Utah which are exposed to earthquake hazards. This should include private sector agreements for use of equipment and may include public agency ownership of certain specialized heavy-rescue equipment.

2. CEM should establish a heavy-rescue training program and conduct

exercises in the special subjects related to earthquake disasters, such as collapsed or severely damaged buildings, highway structures, and other critical facilities.

EARTHQUAKE MEDICAL RESPONSE

Background

A study of earthquake losses in the Salt Lake City, Utah, area (U.S. Geological Survey, Open-File Report 76-89, 1976) identified medical facilities and medical care problems as among the most critical in a major earthquake. A disaster medical organization, as such, does not exist in Utah and must come into being upon the occurrence of an emergency situation, such as a major earthquake. While the State Emergency Operations Plan covers general organizational concepts and procedures, it appears desirable to develop more specific procedures for earthquake disaster medical response.

Recommendations

3. CEM, in cooperation with the State Department of Health, should develop and distribute a disaster medical procedures manual and guidelines to address the problem of treatment and movement of a large number of casualties resulting from an earthquake.

4. Plans should be developed and tested for calling and transporting medical personnel and facilities to earthquake disaster areas. Some steps suggested in this area are: (a) development of an identification card for doctors throughout Utah to allow them to cross police lines and gain access to restricted areas, (b) identification of medical school students, nursing, and other medical personnel who could be sent into disaster areas to provide first-aid and other basic medical support services.

5. Earthquakes and other major disasters create significant psychological stress for victims and emergency services workers. What is needed is the capability to provide counselling at the scene, at homes, disaster assistance centers, and elsewhere. It appears that few mental health workers are specifically trained in disaster response counselling. CEM should initiate and support efforts by State and local health agencies to provide training to health professionals and social workers in disaster response.

COMMUNICATIONS

Background

Adequate communications capability is one of the most important factors in achieving preparedness to respond to an earthquake disaster. Although several communications systems, both radio and telephone, exist in Utah which provide communication links between the State and local agencies and within local agencies, one of the principal concerns with communications systems is

their surviveability in an earthquake. Power source failure, equipment damage or displacement, tower collapse, and damage to telephone equipment are some of the earthquake-related failures that may take place. Special effort is needed to call these vulnerabilities to the attention of communications systems operators.

Recommendations

6. All communications systems operators should evaluate, through technical engineering service, their own and other critical communications systems to be used in an emergency, for surviveability in an earthquake. Techniques for providing earthquake protection should be provided to State and local agencies whose communications systems would be critical in an earthquake emergency situation.

7. CEM should assist in developing a statewide health and medical services communications system and an operating manual for the system.

LAW ENFORCEMENT IN EMERGENCIES

Background

Experience gained from earthquakes in other states has shown that law enforcement agencies are possibly the most heavily taxed of all governmental agencies, except emergency services agencies, in immediate post-earthquake periods. Police departments, sheriff's offices, and state police are looked to for assistance, damage assessment, crowd control, security for damaged businesses, and search and rescue. As well, police communications may be the only operable systems available to other governmental units.

It is fortunate that, in general, law enforcement agencies are well prepared to meet these emergency expectations and responsibilities. Such capability occurs in part because these agencies deal regularly with emergencies, though of lesser magnitude than might occur in a major earthquake, and in part because police training places emphasis upon fast and effective response to unusual conditions. These capabilities of law enforcement agencies are well known to communities--both to agencies and to private citizens--and the needed assistance often is taken for granted to be available.

An important fact to be realized with law enforcement agencies, however, is that their emergency capability derives from preparation, training, and real-life exercises, some planned and some unplanned. Given this observation, it should be evident that more effective response by law enforcement agencies after a severe earthquake can be achieved when preparation and training include specific attention to earthquake disasters. Such exposure has occurred to some extent in Utah in the past when police agencies have been included in emergency exercises planned by emergency management offices. These exercises provide valuable experience, but they do not substitute for more formal training that involves earthquake disasters.

Law enforcement agencies in Utah could benefit from contingency planning for earthquake disasters by management personnel. Enough is known about

possible earthquake damage to Utah's communities to allow evaluation of law enforcement needs for various scenarios, so that management and assignment of limited law enforcement resources are effective in an actual earthquake. To help strengthen Utah's law enforcement emergency response capability, the following recommendations are made.

Recommendations

8. Guidelines for law enforcement emergency response dealing particularly with earthquake emergencies should be prepared as a joint effort between emergency management agencies and law enforcement agencies. Such an effort should begin at the State level between the CEM Division and the Department of Public Safety and should carry through to local emergency services offices and law enforcement offices.

9. The Department of Public Safety should develop and conduct specific training for law enforcement managers in resource utilization for earthquake emergencies. Such training might include delineation of activites for which law enforcement agencies are responsible, activities in which law enforcement officers could be expected to lend assistance, and might even include methods of hazardous building assessment, an activity that likely is not treated in traditional law enforcement training.

10. The critical importance of law enforcement communications systems during severe earthquake emergencies requires continuing reemphasis at all levels of government. Special attention to security of the equipment from damage, such as by collapse of the surrounding facility, is needed.

MUTUAL AID

Background

Mutual-aid operations provide for assistance between the State and local governments or between separate local governments in case of need arising from an emergency situation. Mutual aid between government entities in Utah is formalized and facilitated through a master mutual-aid agreement which has been signed by most local governments. It is intended, under the agreement, that all types of aid involving both equipment and personnel would be available. Some commonly and frequently used mutual aid involves such areas as fire and rescue, law enforcement and traffic control, and medical and health services. In the event of an earthquake disaster in the urban areas of Utah, it is evident there would be need for extensive mutual-aid operations. Such needs would go beyond some of the more commonly used mutual-aid services. Debris clearance and heavy rescue would be significant problems, and one of the early post-earthquake needs would be careful inspection of damaged buildings for safety.

Recommendations

11. CEM should encourage and assist local governments in the Wasatch Front area of Utah prepare a mutual-aid plan for mobilizing heavy-rescue and debris-clearance equipment and personnel. This would involve State agencies, local public works departments, and the private sector.

12. A building inspection mutual-aid plan should be developed in cooperation with local building inspectors, the private sector engineering profession, and the construction industry. The problems of liability in inspection of earthquake-damaged buildings should be investigated and resolved. Most local governments have only a small building inspection staff, and it is evident a large earthquake would generate a very large inspection responsibility which would need to be completed quickly. The ability of local inspection staffs should be developed to deal with structural safety problems resulting from earthquakes. In addition, training is needed to familiarize inspectors with the mutual-aid plan, standard forms, and other procedures that might apply.

SECTION 6

RECOVERY PLANNING IN UTAH

Recovery planning has both a near-term and a long-term component. The near-term component deals with those recovery actions taken within a few days, weeks, or months following a damaging earthquake. The actions often, though not necessarily, are of a temporary nature and largely for the purpose of getting the community "running" again. The long-term component deals with recovery actions that are intended to be permanent. Repair of damaged facilities, replacement of facilities damaged beyond repair, and overall redevelopment may be among the long-term actions.

Recovery entails physical as well as administrative activities, whether of a near-term type or a long-term type. Physical activities include repair, relocation, and reconstruction. Administrative activities include coordination of physical efforts, management of assistance grants and loans, and regulatory processes involving permits and land-use approvals.

EMERGENCY ASSISTANCE PROGRAMS FOR NEAR-TERM RECOVERY

Background

The disaster recovery phase after a major earthquake will require prompt and accurate damage assessment and then administration of both individual assistance and public sector assistance programs to repair and restore damaged public facilities and assist individuals to secure safe housing. The prompt inspection of all standing buildings for structural soundness and safety will be of critical importance to recovery from the earthquake. In a major earthquake along the Wasatch Front, the requirements for trained staff to operate disaster assistance centers and provide individual assistance could be overwhelming. The Study of Earthquake Losses in the Salt Lake City, Utah, Area (USGS Open File Report 76-89, page 333), stated that as many as 30,000 people could be homeless or could require temporary shelter pending reestablishment or relocation after a severe earthquake. The following is quoted from page 334 of the study.

> "Effective remedial steps to maintain the essential public services or to return them to operation following a large earthquake will depend upon the prompt and informed actions of public agencies. Response planning should include not only consideration of disaster problems within a particular jurisdiction but also sharing of assistance with neighboring jurisdictions. Moderate response requirements in one area can free resources to aid communities in more heavily damaged portions of the affected area."

Recommendations

1. CEM should assist local governments to organize a building inspection

mutual-aid program and should provide training for earthquake damage inspection. Structural engineers from the private sector might be organized and included in the building inspection program.

2. CEM should arrange to obtain qualified personnel from other State agencies to develop a reserve force who can be brought on staff to augment State and local personnel for operation of disaster assistance centers. These positions would require training in disaster assistance administration. Since State agencies may be reluctant to commit personnel and funds to support disaster relief activities without assurance these funds would be replenished, the State should appropriate a disaster contingency fund to finance direct disaster relief response.

3. Post-earthquake investigation can provide a means of learning from the disaster in order to improve emergency plans and training programs and to develop better response capabilities. The Earthquake Engineering Research Institute (EERI) has a well-organized system of assembling teams of earth scientists to study major earthquakes anywhere in the world. Such assistance should be encouraged by the State. In addition to EERI, many other organizations and individuals may visit an earthquake site to gather a wide variety of information. Such random visits can produce duplication and confusion. It is recommended that plans be developed to establish an earthquake investigation clearinghouse to be activated when an earthquake occurs. This would provide a central location where investigators can check in and can share information with other investigators. This clearinghouse would also facilitate preparation of post-earthquake reports by State agencies or others, and could provide information to other emergency services agencies.

LONG-TERM RECOVERY AND PUBLIC POLICY

Background

In the longer term, the disaster recovery phase, which may continue for many months or years, will require fresh and innovative public policy to preclude similar future earthquake damage to the same area and facilities. When or if the opportunity appears for a community to plan anew, it makes no sense at all to reintroduce old vulnerabilities and old deficiencies. Yet, in the haste to reconstitute a severely damaged community, there will be tremendous pressures from special interest groups who seek expedient solutions and quick fixes for problems. Local elected officials and administrators will be able to resist such pressures only if reasonable alternatives are identified and only if technical assistance is made available to provide guidance in implementing the alternatives.

There are steps that can be taken in Utah to ensure more effective long-term recovery from earthquake disasters. They begin with a recognition that long-term recovery can and should be managed. They are followed with pre-disaster planning for long-term recovery. Since one cannot know ahead of an earthquake the nature of actual losses that a community might experience, it

is not possible to prepare specific recovery plans for a neighborhood or a community. But, it is possible to outline before the disaster those public policies which should guide the recovery process. Building standards for new construction and land-use are two of the more significant public policy tools in this regard.

To better prepare the State to handle long-term recovery from earthquake disasters, the Seismic Safety Advisory Council makes the following recommendations.

Recommendations

4. The State should establish a Long-Term Recovery Task Force to prepare appropriate public policy for earthquake disasters. Such a task force would be largely inactive after an initial period to outline appropriate policies, but would be activated following a disastrous earthquake to provide needed guidance and direction for major recovery efforts. This task force should comprise knowledgeable experts in land-use planning, architecture, structural engineering, and engineering geology, plus representatives of elected government where the authority for making public policy resides.

5. The State of Utah should establish its own standards for long-term recovery that are to be applied when State resources and assistance are rendered to communities of the State impacted by earthquakes. By this action, the State can reduce the future possibility of expending public funds for recovery from repeat earthquake losses to the same facilities.

SECTION 7

SUMMARY AND CONCLUSIONS

This report has discussed the four major phases of comprehensive emergency management as they relate to potential earthquake disasters in Utah.

- Mitigation--Those actions taken before an earthquake to reduce or avoid the impact upon people and facilities.

- Preparedness--Those actions taken before an earthquake to increase the readiness and capability of the emergency organization.

- Response--The deployment, coordination, and utilization of resources immediately after an earthquake.

- Recovery--Near-term and long-term actions taken to provide relief assistance and community reconstruction.

The Utah Division of Comprehensive Emergency Management has a primary role in the preparedness phase, where its programs and activities can have the greatest influence in reducing casualties and property loss in a major earthquake in Utah. CEM also will play a vital role in the other three phases in assisting other State and local government agencies to develop the readiness and capability to carry out assigned functions.

The Utah Seismic Safety Advisory Council believes the recommendations for action contained in this report are ambitious, but are important if State government is to fulfill its proper leadership role in preparing for an earthquake disaster. All of the actions may not be accomplished in a two or three-year period, but the important thing is to get started on a systematic program to meet the problems which have been identified. Accomplishment of a modest number of the recommendations would advance earthquake safety for the citizens of Utah who live in a high earthquake risk environment.

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