THE CALIFORNIA SEISMIC SAFETY COMMISSION, 1975-80:

PUBLIC POLICY AND A PRACTITIONER'S OBSERVATIONS

Robert A. Olson

Introduction

A recent article in a national scientific journal stated that, "The establishment of this commission is the greatest public accomplishment on earthquake hazard mitigation in California since the great study of the 1906 earthquake by the State Earthquake Investigation Commission, set up specially for this purpose." [Bolt, 1978]

After a four year (1970-74) study of the earthquake hazard in California by the Legislature, the Seismic Safety Commission was created as an independent agency in 1974. It was made independent because of the need to evaluate existing programs; provide coordination of twenty State agencies operating nearly fifty earthquake safety programs plus those of local government and related efforts of national agencies; and find practical solutions to unanswered problems of hazard reduction and seek their implementation. The Commission's primary role, therefore, is the development and implementation of public policy.

Responsibilities and Objectives of the Commission

Because of the complex nature of earthquake hazard policy, the enabling legislation is very broad. The Commission's responsibilities include:

- Advising the Governor and Legislature on earthquake programs;
- Reviewing earthquake-related programs financed by the State and recommending improvements;
- Setting goals and priorities for reducing the earthquake hazard in the public and private sectors;
- Providing a consistent policy for earthquake-related programs for agencies at all government levels;
- Proposing needed legislation and reviewing other earthquake-related legislation;
- Conducting public hearings on earthquake safety issues;
- Helping to coordinate the earthquake safety activities of government at all levels;
- Recommending program changes for earthquake safety to State and local agencies and the private sector;
- Requesting State agencies to devise criteria to promote earthquake safety;

- Recommending adding, deleting, or changing State standards when such actions promote earthquake safety;
- Reviewing construction efforts after damaging earthquakes; and
- Gathering, analyzing, and disseminating information, encouraging research, and sponsoring training.

Annually, the Commission designs a work program for the year. This work program contains specific tasks aimed at achieving several key objectives. They are: (1) To insure reasonable seismic safety standards for new design, construction, and building; (b) To reduce existing earthquake hazards; (c) To insure optimum preparedness for, response to, and recovery from earthquakes; (d) To assess and improve the state-of-the-art; and (e) To provide legislation, information, and technical assistance.

In the five and one-half years of the Commission's existence, it has provided oversight and coordination for many activities; supplied expert technical assistance to the Legislature, several State agencies, and many local governments; reviewed in detail several existing programs and sponsored successful legislation to reduce costs and improve their operation; focused on key issues needing solutions and working toward them; forged better working relationships between State agencies and several national ones; and completed other projects related to codes and standards for safer construction.

Policy Development: Selected Examples

The role of the Seismic Safety Commission in the development and implementation of public policy can best be shown by examples of its work. First, a report to the Governor and Legislature recommending a comprehensive approach to earthquake safety from now through the year 2000 is nearly finished. This report will contain a short-term improvement program recommending a level of financing for each existing or proposed new state earthquake safety program. In addition, the report will contain a summary of key unresolved policy issues needing a more thorough examination before the Commission can recommend what state laws, regulations, or programs are needed.

Second, over the years the Commission has been very active in proposing new or amending existing laws. It is seen as the initiator of most legislation in this field, and currently the Seismic Safety Commission is sponsoring legislation that will affect the construction of hospitals, the installation of mobile homes, and public education for earthquakes. In the past it has worked on laws related to standards for the rehabilitation of dangerous buildings, liability for earthquake prediction, requirements for geologic reports for development, and others.

A third example is "the vision" presented by the Commission in its report titled "Goals and Policies for Earthquake Safety in California". This report has been widely distributed and has as its purpose the stating of long-term goals and policies that represent the Commission's views about what should be accomplished in the decades ahead. Next, the Commission has designed a technique to assess the earthquake hazard of thousands of buildings owned by the state government (office buildings,

university and state college buildings, hospitals, prisons, etc.). This is a major policy development in that it allows budget officials to compare the hazard and allocate funds for reconstruction based on a system of priorities.

Fifth, the Commission plays a continuing and influential role in articulating the need for adequate independent review processes related to the construction of critical facilities. An independent review means that the design, plans, calculations, and construction processes are independently evaluated and monitored so that earthquake safety is enhanced. The Commission does not do the independent reviews, but it has been instrumental in creating review processes for specific facilities, including Auburn Dam, liquid natural gas terminals, and the study of an existing building housing radioactive materials at a national laboratory.

A new project to design a comprehensive guide for post-earthquake investigations provides a sixth example. To optimize learning from future damaging earthquakes it is important that topics for which data are needed be identified and the proper information collected. Although damaging earthquakes are regularly investigated by various groups, there has not been a consistent, comprehensive, or detailed enough investigation of most of them. The Commission's guide will attempt to define the needs and hopefully will guide future investigations so that research opportunities are not missed.

A final example is demonstrated by a comprehensive regional earthquake preparedness project the Commission has begun in Southern California. Jointly financed by the state and national governments, it is an experiment designed to develop and implement a common planning process in an area with five county governments, over one hundred cities, and numerous special districts, each with its own legal authority and government. If successful, this planning process could then be used in similar metropolitan areas to produce a coordinated set of preparedness and response plans for both predicted and unpredicted events.

1975-80: Lessons from Policy Making

The Commission's deep involvement in the development and implementation of public policy has covered a wide variety of issues, some of which have been very controversial and highly politicized. It seems timely to assess the major lessons that have been learned from these experiences.

First, it is critical that political leaders and decision-makers be supportive of the Commission and its programs. These relationships have to be carefully developed, and it also requires that the Commission be politically sensitive so that its desires are seen as realistic and politically acceptable. This is an ever-changing element of the environment; for example, the Governor's Budget for 1979-80 proposed to abolish the Seismic Safety Commission, but this effort was soundly defeated. During the next two years, the Commission's life was extended for an additional six years, its authority expanded, and a special

appropriation of $750,000 was made to help finance the special project in Southern California.

Second, although the pool of technically qualified people is quite large in California, the number who can successfully apply that knowledge to the development of public policy and the politics of implementation is very small. About four years ago the Commission refused a $1,000,000 appropriation because the state-of-the-art and the number of people available to do what the Legislature asked were not available. Better to explain this to the lawmakers than to accept the money and not meet their expectations. In general, the relationship between technical expertise and the policy-making process has been established only recently and is not well understood by most "earthquake experts". Translating technical knowledge into public policy causes changes, and they appear in organizations, educational processes, professional practices, governmental decisions and public opinion. Few members of the scientific and technical community realize that they are involved in a social change process, and this understanding is a key to having an effective Commission.

Factors of organization and style provide a third lesson. Experience gained during the Commission's life indicates that the expertise and reputation of its membership is critical. To maintain the degree of excellence of the past will be the challenge of the future. It has also proven critical that the Commission have direct access to the Legislature and that it maintain an active legislative program so that its presence is felt on a continuing basis. Moreover, the quality of the work done by the Commission must be of the highest order. In many cases there is sufficient substantive controversy, and it is important that the quality of work not be debatable so that decision-makers are not placed in a position of judging the competence of an "expert" Commission.

A fourth lesson is that the expectations of the people who voted to create the Commission see their expectations fulfilled. The concept of the Commission was to provide a focus for leadership and initiative as well as an organization to which problems can be referred. The Commission has performed these roles and, therefore, is seen as fulfilling its mandate by those who periodically review its work and provide its money.

Fifth, because it is concerned with general policy and is both advisory and independent, it has been able to avoid competition with regulatory or operating agencies--those that have specific technical programs or regulatory functions. This has helped insulate the Commission from bureaucratic infighting. In fact, the Commission has helped play an integrative role by helping organizations work together on common problems.

The Commission's independent review of existing programs has taught the sixth lesson. Not only have substantive changes been made as a result of these evaluations, but it has put people on notice that their efforts may be studied, and, if found wanting, the law or organizations may be changed. Consequently, the operating agencies keep a careful eye on the Commission.

Seventh, the Commission also serves as a link between the scientific, technical, and earthquake research communities and the application of knowledge for public safety. Thus, the Commission is seen as an active agent for change through which knowledge can be partially implemented. For example, the Commission regularly receives research studies that might have policy implications and periodically hears directly from researchers about their projects and recommendations. Much of this information finds its way into the Commission's work program, or in some cases these same people are asked to serve on committees to help the Commission.

Although during this period there have been several moderate damaging earthquakes in California (Oroville, 1975; Willits, 1977; Santa Barbara, 1978; El Centro, 1979; Coyote Lake, 1979; Livermore, 1980; Westmorland, 1981), none has been significant enough to raise the earthquake safety issue on the political agenda sufficiently to see enactment of the bold and innovative initiatives that followed the 1971 San Fernando earthquake. This eighth lesson suggests that in the absence of relatively major damaging events progress will be made on an incremental basis, and it will be harder to mobilize support for some proposals. Nevertheless, the Seismic Safety Commission has in its "memory" a long list of desired legislative proposals and executive changes it would like to see implemented. With a little work, the right opportunity, and support these desires could become realities.

History provides a ninth lesson. In planning the Commission, serious debates took place about its composition. At one extreme it was proposed that the Commission be solely a technical body because, it was argued, only experts in the field could properly perform the roles the Commission was expected to play. On the other hand, there was strong argument that the Commission should be composed of generalists familiar with, but not expert in, the earthquake problem, and that they should be advised on a continuing basis by a technical advisory committee. This view was based on the belief that the Commission should pay primary attention to the governmental structure and political processes in California state government. Predictably, a compromise was reached and the law establishing the Commission represents a balance between technical representatives and generalists. Looking back on five years experience, it appears that this was not only a reasonable compromise but has turned out to be very effective. One need only listen to the Commission's discussions to appreciate the variety of viewpoints and the wide range of considerations that are taken into account.

The final lesson from five years' experience is that the Commission can be effective although it is only an advisory body. Initially, it was debated whether the Commission could be effective without having regulatory powers or operating responsibilities since most formal organizations believe they must have either or both to be effective. In a practial sense, given the political environment at the time (1974), an advisory commission was all that was acceptable. The absence of regulatory or operating responsibility has given the Commission an unusual amount of freedom to explore, in the depth needed, policy issues which it feels are important and to decide what actions are warranted. Should it have been given regulatory or operating responsibilities, undoubtedly the Commission would have been preoccupied with the

performance of these responsibilities and probably neglected the research and discussion of fundamental policy needs. By skillfully using the techniques it has available, the Commission has shown that it can be a very effective organization in promoting earthquake safety without having a great deal of formal power.

Surely there are other lessons that can be learned from the past five years. The Commission's unique role in earthquake safety in California would make it a valuable case study. What would be learned could help guide the planning and operation of similar policy oriented programs elsewhere.

The Commission's Environment: Factors Influencing Policy

There is little knowledge about factors which facilitate or impede earthquake safety policy development. Those who share the responsibility for the translation of knowledge into public policy would benefit greatly from a more thorough understanding of the forces involved.

From a practitioner's perspective, a number of factors seem to be influential in promoting earthquake safety. First, the occurrence of significant earthquakes presents opportunities for public action. This is due to heightened interest and the consequent motivation of public officials. Political bodies face many pressures and crises in normal times, and it is easy to understand why problems related to earthquake safety receive relatively low attention during the interim.

A second factor are the activities of advocate organizations and opinion leaders. They offer ideas, proposals, support, and the influence necessary to help achieve seismic safety objectives. Legislators, members of city councils and boards of supervisors, and private sector leaders who have some expertise in the subject play key roles in developing new public policy.

A more recent factor supporting improved seismic safety is the awareness of environmental quality. The concerns about air and water quality, resources conservation, growth management, and similar problems have supported increased attention to environmental safety, especially when it is related to natural hazards.

The rapidity of communications is a fourth major factor. Damage information communicated to the American public as a result of earthquakes in Nicaragua, Guatemala, Turkey, Italy, Romania, Iran, the Philippines, and many other countries has meant that viewers and readers can understand the effects of disastrous earthquakes almost immediately.

A fifth influence has been increased financial and human resources devoted to earthquake safety. The results of this investment primarily by the government are that the earthquake problem is better understood, knowledge of its implications has entered the field of practitioners, college and university curricula have expanded to include courses dealing partially or entirely with earthquake hazards and expanded research programs have been undertaken within, or financed by, government and

other organizations. This has produced a larger community of knowledgeable people, answers--or at least approaches to answers--to problems that need study; and support of some action programs, such as the creation of the California Seismic Safety Commission.

A last and relatively new factor that may be facilitating improved seismic safety policy is the publicity surrounding earthquake prediction research. As noted earlier, the greatest advancements in earthquake safety seem to be in response to the larger damaging earthquakes. The emergence of earthquake prediction as a major research effort in the United States and elsewhere has provided the subject with continuing popularity. Although the public may get confused about the state-of-the-art, the validity of specific predictions, and the reliability of certain sources of information they are continually reminded that the earthquake threat is present and that people are working on ways possibly to predict such events.

It is also fairly easy to identify some factors that appear to impede the development of seismic safety policy. First, the absence of damaging earthquakes has an effect on the receptivity of decision making bodies to enact or support new programs. Closely related is the problem of other priorities that demand attention. Policy-making is a very dynamic process, and to a large degree it tends to be somewhat crisis oriented. The California Legislature, for example, has been concerned recently with property tax reform, public school financing, medical malpractice insurance, and other major issues. Should a big earthquake occur, one effect would be to change its priorities, and more attention would be given to earthquake safety. This was clearly demonstrated following the 1971 San Fernando earthquake. A further difficulty has been the inability to define the threat in precise enough terms so that people perceive that there is a high probability that they will be affected. This seems to be a strong factor. However, the development of a reliable and effective prediction system will almost certainly erode its influence.

Another problem which has impeded further policy actions has been the somewhat negative reaction to some programs. This has required their defense, particularly as the time between earthquakes becomes longer. People have spent time going back to California's Legislature to defend the standards for school construction enacted after the 1933 earthquake, and since the 1971 earthquake there have been such occasions with regard to programs initiated following that event. Under these circumstances, it is hard to initiate new measures. A last influential factor has been the inability to demonstrate clearly the effectiveness of many existing programs. Partly this is a function of the relative infrequency of damaging earthquakes. It is only in recent years, for example, that enough data have accumulated about the actual behavior of public school buildings built since 1934 according to the Field Act to know that the program is basically sound.

In sum, it has been traditional in summarizing the history of policy to follow a chronological sequence, usually beginning with the development of local codes following the 1925 Santa Barbara earthquake. Depending upon the observer's viewpoint, this leads to observations such as, "Look at how much we have been able to do, particularly in the recent

past," or "Look at how litle we have learned and applied from past earthquakes".

However, when this chronology is separated from the dates of major policy developments, there is an interesting dichotomy. After some of the larger magnitude earthquakes in California there have been major policy changes, but this discussion must also account for the occurrence of other significant damaging earthquakes where nothing of policy significance happened, except perhaps for relatively minor "tinkering". The question is "Why not?". No major policy changes followed the 1906 San Francisco "fire," the 1952 Kern County earthquakes, the earthquakes in Eureka, California and Dixie Valley, Nevada in 1954, the 1957 Daly City earthquake, the 1969 Santa Rosa earthquake, and the 1975 Oroville earthquake.

The presence or absence of the above factors which facilitate or impede the development of seismic safety policy may help account for the different responses to historic damaging earthquakes. A valuable research project, carefully done, and tested against the public records of previous earthquakes, might show that certain combinations have produced actions. Their absence might help explain inaction.

Future Policy Issues

Some major policy issues which will continue to be on the agenda for the future include sustaining an effort to reduce hazards from non-earthquake resistant buildings; the social, economic, and policy implications of earthquake prediction; concern about the safety of critical facilities and services and the role of government in setting siting and design standards for them; assessing the role of the Uniform Building Code as a basis for minimum standards and the quality of enforcement; and the increasing need to integrate the activities of local, state and national agencies to achieve earthquake safety.

Increasing emphasis must be placed on more effectively using knowledge and speeding up the process of translating it into effective programs. Organizations such as the Seismic Safety Commission may take on added significance by acting as a link between the knowledge community and governing authorities. There will continue to be a strong need for policy oriented research to help answer some of the difficult questions related to the design, acceptance, and administration of public programs.

Conclusion

Concern about the earthquake hazard will continue in California, especially when noted scientists are quoted as saying:

> In anticipating the next big California earthquake of magnitude 7 or higher, we must conclude that time is running out. The evidence strongly suggests that such an event must

> now be considered imminent. Until recently there has been a tendency to think of such an occurrence in terms of "the next 10 or 20 years". But now, for several reasons, we can no longer keep pushing this "time window" into the future. In short, present evidence that a large earthquake is imminent in California is much stronger now than 30 years ago--or even 10 years ago. [Bolt and Jahns, 1979].

To a significant degree it will be the focus on public policy and its implementation that will lessen the risk. In all likelihood, progress will be made incrementally, and understanding the policy-making process is central to taking the constructive steps required to achieve a higher level of safety. One should probably not look for major breakthroughs until a major damaging earthquake strikes. Rather, a cumulative record of significant policy achievement should be sought.

REFERENCES

American Society of Civil Engineers. The Current State of Knowledge of Lifeline Earthquake Engineering, ASCE Special Conference. Proceedings. University of California, Los Angeles, August 30, 1977.

Blume, John A. "Civil Structure and Earthquake Safety" in California. Legislature. Joint Committee on Seismic Safety, Earthquake Risk, Conference Proceedings, September 22-24, 1971, Sacramento: 1972.

Bolt, Bruce A. "Earthquake Hazards," EOS: Transactions, American Geophysical Union, Vol. 59, No. 11 (November 1978), pp. 946-962.

Bolt, Bruce A. and Richard H. Jahns. "California's Earthquake Hazard: A Reassessment," Public Affairs Report, Vol. 20, No. 4 (August 1979).

Campbell, I. "The Influence of Geologic Hazards on Legislation in California," Bulletin of the International Association of Engineering Geology, No. 14 (1976), pp. 201-204.

California. Legislature. Joint Committee on Seismic Safety. Meeting the Earthquake CHallenge. Sacramento: January 1974.

California. Seismic Safety Commission. Goals and Policies for Earthquake Safety in California. SSC 79-04. Sacramento: 10 May 1979.

California. Seismic Safety Commission. Report on State Agency Programs for Seismic Safety, Christopher J. Wiley, Consultant. Sacramento: June 1979.

Dye, Thomas R., ed. The Measurement of Policy Impact, Conference Proceedings, Florida State University, 1971.

Earthquake Engineering Research Institute. Learning from Earthquakes: Planning and Field Guides. Berkeley: EERI, 1977.

Foster, Harold D. Disaster Planning. New York: Springer-Verlag, 1980.

Haas, J. Eugene and Dennis S. Mileti. Socioeconomic Impact of Earthquake Prediction on Government, Business, and Community: Research Findings, Issues and Implications for Organizational Policy. Boulder: University of Colorado, Institute of Behavioral Science, n.d.

Lipsky, Michael and David J. Olson. Commission Politics. New Brunswick, New Jersey: Transaction Books, 1977.

Los Angeles (City). Consensus Report of the Task Force on Earthquake Prediction, Rachel Gulliver Dunne, Chairman. Presented to Mayor Tom Bradley. Los Angeles: October 1978.

Nakamura, Robert T. and Frank Smallwood, The Politics of Policy Implementation. New York: St. Martin's Press, 1980.

Steinbrugge, Karl V. and Carl B. Johnson. "Earthquake Hazard and Public Policy in California," Engineering Issues, Vol. 99 (1973), pp. 513-519.

Turner, Ralph G., Joanne M. Nigg, Denise Heller Paz, and Barbara Shaw Young. Earthquake Threat: The Human Response in Southern California. Los Angeles: Institute for Social Science Research, University of California, 1979.

United States. Executive Office of the President. Working Group on Earthquake Hazards Reduction. Earthquake Hazards Reduction: Issues for an Implementation Plan. Washington, D.C.: Executive Office of the President, 1978.

United States. National Research Council. Assembly of Mathematical and Physical Sciences. Committee of Seismology. Panel on Earthquake Prediction. Predicting Earthquakes: A Scientific and Technical Evaluation--with Implications for Society. Washington, D.C.: National Academy of Sciences, 1976.

United States. National Research Council. Commission of Sociotechnical Systems. Advisory Committee on Emergency Planning. Panel on the Public Policy Implications of Earthquake Prediction. Earthquake Prediction and Public Policy. Washington, D.C.: National Academy of Sciences, 1975.

United States. National Science Foundation (RANN-Research Application Directorate) and U.S. Department of the Interior (United States Geological Survey). Earthquake Prediction and Hazard Mitigation Options for USGS and NSF Programs. Washington, D.C.: U.S. Government Printing Office, 1976.

Weiss, Carol H. Evaluation Research: Methods for Assessing Program Effectiveness. Englewood Cliffs, New Jersey: Prentice Hall, Inc., 1972.