

Final Report

THE ROLE OF STATES IN EARTHQUAKE AND NATURAL HAZARD
INNOVATION AT THE LOCAL LEVEL:
A DECISION-MAKING STUDY

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The Role of States in Earthquake and Natural Hazard
Innovation at the Local Level:
A Decision-Making Study

December 1984

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LIST OF ABBREVIATIONS

ABAG	Association of Bay Area Governments
BAES	Bay Area Earthquake Study
CalTech	California Institute of Technology
CAO	City Administrative Office
CCEP	Coordinating Committee for Earthquake Prediction
CEPEC	California Earthquake Prediction Evaluation Council
CSSC	California Seismic Safety Commission
DRI	Desert Research Institute
EEC	Earthquake Education Center
FDAA	Federal Disaster Assistance Administration
FEMA	Federal Emergency Management Agency
IEMS	Integrated Emergency Management System
JMA	Japan Meteorological Agency
LECA	Large-Scale Earthquake Countermeasures Act of 1978
MDU	Memorandum of Understanding
MPT	Mitigation-Preparedness Tableau
NEPEC	National Earthquake Prediction Evaluation Council
NEHRA	National Earthquake Hazards Reduction Act
NLA	National Land Agency
NOAA	National Oceanic and Atmospheric Administration
NRC	Nuclear Regulatory Commission
NSC	National Security Council
NSF	National Science Foundation
OES	Office of Emergency Services
OSTP	Office of Science and Technology Policy
PAB	Policy Advisory Board

PEPPER	Pre-Earthquake Planning for Post-Earthquake Recovery
SANBAG	San Bernardino Associated Governments
SCAG	Southern California Association of Governments
SCEPP	Southern California Earthquake Preparedness Project
SCEPPP	Southern California Earthquake Prediction Preparedness Project
SPB	Security Pacific Bank
SSC	Seismic Safety Commission
UNR	University of Nevada at Reno
USGS	United States Geological Survey

PART I

EXECUTIVE SUMMARY

Introduction

This is a study of the process of policy innovation in earthquake preparedness. While hardware is sometimes involved, "soft" innovations are the focus of this report. These social technologies which affect individuals and organizations are "policy innovations." Their aim is to direct public policy to enhance earthquake preparedness. In order to understand the development and utilization of these policy innovations, we have studied the process of earthquake innovation in three policy settings: emergent, advanced, and intermediate. In the first, individuals are forming organizations and trying to raise government awareness of the earthquake issue. South Carolina and Nevada are examined as examples of an emergent setting. Japan provides insight into an advanced policy arena where the relevant social technologies are institutionalized. The intermediate policy setting is one characterized by institutions and political agendas to deal with the earthquake threat, but these innovations are as yet unstable and remain to be fully incorporated.

Most of the present study deals with the intermediate earthquake policy system of California. The reason is that the writer has played the unofficial role of outside monitor for the Southern California Earthquake Preparedness Project (SCEPP). SCEPP was established as an earthquake project in southern California by the federal government and California. Its function was to stimulate preparedness for a predicted or unpredicted earthquake. It was seen by both California and the Federal Emergency Management Agency (FEMA) that what was being attempted in California was itself novel and experimental and worthy of documentation along the way. SCEPP's process and products would constitute a social technology potentially transferable elsewhere. A documentation would permit better evaluation of the process and its possibility for transfer. The

request went to the National Science Foundation (NSF) which had just awarded us a grant to do research in California and selected other states on earthquake policy innovation. It was natural for us to respond to this request. It did reorient the original project, but in ways deemed desirable by everyone familiar with what was being done. The reason is that some innovations are more important than others, and SCEPP is generally regarded as perhaps the most significant institutional innovation to take place in earthquake preparedness policy in many years.

Approach

Regardless of whether we are studying an emergent, advanced, or intermediate earthquake policy system, we use the same conceptual approach. This is one that links policy actors with policy processes. Policy is a process that occurs over stages. At different stages, various types of actors tend to be involved. They play similar roles. Who plays these roles varies with the policy at issue and nature of the society being studied. In an advanced and relatively small earthquake system like Japan, for example, earthquake issues are national in scope and involve policy level participants at the national as well as prefectural and local levels. Their involvement in the issue is likely to be frequent and intense. In an emergent system, such as South Carolina or Nevada, participation is primarily at the state and local level. The involvement of policy officials is less likely, less frequent, and less intense. In the intermediate system of California, there will be national, state, and local activity. Policy officials will be involved, but that involvement is not at the frequency or intensity seen in an advanced system. Earthquakes are a national priority in Japan. In the United States, there is national policy, but not national priority. The following process suggests the course of most policy innovations in the earthquake field.

Process

1. A given policy innovation process begins with an awareness by an individual or group of a major problem or opportunity requiring governmental action in the earthquake preparedness field. This awareness stage can be lengthy. Often, there are only a few individuals who share and actively promote a particular concern. These individuals who are the entrepreneurs in the awareness stage may or may not be in government.
2. Required is a trigger--a stimulus to move awareness to policy action of some kind. The trigger causes the issue to go from the backburner to an item of governmental concern, even priority.
3. A process of search/planning for an appropriate response unfolds. Initially the search is general, but gradually it narrows to specific options.
4. An option for policy is proposed for adoption by government. Adoption requires a conferring of legitimacy, usually by elected representatives of the people. It also generally involves funding.
5. If adopted, a policy must be implemented. The policy becomes a program, and the program goes into an existing organization or becomes the base around which a new organization is formed. Implementation can be divided into two basic phases: (1) early implementation, in which program design and staffing are major concerns and (2) later implementation, in which program execution becomes critical. It is during this later implementation phase that policy is translated into program action and, in the earthquake field, social technologies are developed and utilized.
6. Finally, there is incorporation, the end of implementation, when a program is completed and ceases to be innovative. In many government programs, incorporation (institutionalization) entails a transfer of control of the new products and processes from the innovating to the using organization. In the process, the user organization adapts the technologies, and is, in turn, changed by them.

The above is potentially quite a long process. It is also quite complicated. It may take many, many years and be interrupted along the way. Any stage can include innumerable substages. It is no wonder that true policy innovation is the exception rather than the norm in government. Entailed is not one innovation, but many innovations of different types: legislative, organizational,

programmatic. It is an upsetting process, one that individuals, organizations, and political systems can endure only to some degree. Innovations may fail, and failure entails risks to all the parties involved. Finally, innovations are not necessarily all in the public interest. Opposition to innovation may be warranted. It may be essential not only to stop deleterious innovations, but also to modify those that are being developed to make them more acceptable to those who are their ultimate users and beneficiaries.

Roles

Who makes innovative earthquake preparedness policy happen? The answer is many. But, who are they? The answer is that there are certain basic roles that are involved in any innovation policy process. These roles are played by organizations and individuals. At minimum, the roles are two: developers and users. The developer is the organization that creates the innovation. The users are those who are the clients of the new products and processes that are being brought into being. If the world were less complex, developers and users would be sufficient for decision making. However, the world is complicated. Because of that fact, there are innumerable other roles that are involved in speeding up or slowing down the innovation process. For example, there must be sponsors--who pay for the development and who are often outside of both users and developers. There may also be opponents who do not want the innovation that is being developed, for one reason or another, or who think that it must be modified to be made more acceptable. There may also be beneficiaries--for example, the general public. Beneficiaries may not actually participate in a given decision by a developer or user or sponsor or opponent, but they are affected by decisions and in turn can influence them indirectly by their attitude.

Finally, there is a role that is most critical to any innovation process. This is that of the entrepreneur. The entrepreneur is the moving force for change. It is a role that creates change through political coalition building. Any of the above actors can also be

an entrepreneur. Often, who is the entrepreneur changes over time. This is especially the case where policy innovations are at issue. The sponsor is the initial entrepreneur, but gives way to the developer as the process moves forward. As insitutionalization takes place, the user must become the entrepreneur or the innovation withers. Finally, when the innovation is fully institutionalized and no longer perceived as new, there is no need for an entrepreneur. The role disappears when the process of innovation is complete.

In the cases narrated in the following pages, it will be seen that entrepreneurs take different forms. The players in the roles vary. In South Carolina, the principal entrepreneurs are not in government at all, but in universities. In California, the principal entrepreneur is a project organization, an entity created to deliberately foment change in the region of southern California. It is a policy entrepreneur, and its mission is change within the intergovernmental, public-private system. This is change not in one user, but many users. We call this mission "systems innovation," to denote that what is intended is change in the elements of a system (local governments, private companies) and in the southern California region (the system) as a whole.

In Japan, there is no need for a special project organization to be specially created to catalyze systems change. The earthquake entrepreneur is within government itself. In Shizuoka prefecture, there is a political leader who is himself an entrepreneur--a "Governor Earthquake"--who symbolizes the priority of this problem in a nation at an advanced stage of policy development. Bolstering him is an agency that is a policy entrepreneur. It has managed to retain its innovative drive over years and successive shifts in personnel.

Thus, there is the critical difference in policy systems in who fills the entrepreneurial role. The higher the priority of earthquakes, the higher in government, and more a continuing part of government, will be earthquake entrepreneurship. What all entre-

preneurs have in common is the need to build supportive coalitions--of sponsors, developers, and users--into a system for innovation. To do that, entrepreneurs must overcome the twin adversities of apathy and active opposition. They must also survive--for what is clear is that entrepreneurs "make waves" and thus draw criticism. Also, as noted, innovation takes a great deal of time. It is not for the fainthearted or easily discouraged.

Summary Analyses

Japan

Japan represents an advanced policy system model. It has been in the earthquake preparedness field a long time and has done a great deal. It has recently moved to a greater level of activity in a way that places it at the forefront in the world. For 20 years, Japan has had a national goal to develop a reliable technology of earthquake prediction. Five years ago, Japan moved beyond research and development to an operational prediction program. While maintaining its scientific effort, Japan has also set up a program to use the technology of earthquake prediction as it exists at present. Japanese scientists do not believe earthquake prediction is technically "ready," in the sense of being a fully developed reliable technology. It is clearly an emergent and uncertain technology, requiring much more research. However, a national policy decision has been made that it is "ready enough" to be utilized under certain conditions. Scientists participated in this decision, but it was not a scientific decision--it was a policy (i.e., political) decision. Japan has passed a unique public policy. The Large-Scale Earthquake Countermeasures Act of 1978 (LECA) assumes that earthquakes are predictable and that predictions of damaging earthquakes will be issued. It sets forth preparedness policy for prediction and prediction response.

Without question, Japan has the world's most comprehensive and far-reaching national policy for earthquake prediction and preparedness. It is written for one quake, but is relevant to all with

"large-scale" destructive potential. It arose because of one credible, but "general," scientific prediction, and seeks to make it better possible to have the benefits of a specific short-term prediction without its costs. LECA is truly a case of national policy innovation.

The advanced setting of Japan reveals a nation moving to establish what is, in effect, a national project for the application of earthquake prediction. Japan was engaged in research and development for many years and on a scale far larger than has been the case in the United States. It has also forwarded various mitigation and preparedness programs over the years. Now, it has linked prediction with preparedness in a way that is large in scale and the first of its kind in the world. It is a disaster prevention effort for the Tokai region and a national demonstration of what can be done to minimize death and damage from a quake that is expected in the not too distant future.

Japan has been successful in preparing for a catastrophic earthquake. What lessons can be learned from Japan's earthquake experience? Five stand out:

1. high-level government support is essential to full policy innovation;
2. policy need not lag behind technological developments to be "realistic," although a scientific consensus is crucial;
3. citizen information--self-help--programs are the key to broad preparedness, and public awareness must be maintained;
4. nothing is so effective in moving policy than a visceral awareness of the threat; and
5. intergovernmental and private sector constituencies must all work together in response to the earthquake threat if results are to be achieved.

With hindsight, however, we should be aware that there remain significant issues in the Japanese system which would be equally important if that system were transferred elsewhere. These issues are:

1. initial momentum must be maintained to propel the efforts;
2. there is concern about the intermediate or highly uncertain prediction (several months to one year) and the effect this would have on the public and, hence, the socio-political economy;
3. there is pressure to expand the focal area of the LECA system to other regions in Japan; and
4. particular stipulations affecting the media that are related to the program have not been accepted with complete enthusiasm by the media.

South Carolina and Nevada

The emergent settings of South Carolina and Nevada provide a very different picture of earthquake preparedness. First, prediction is not at issue at all. So little is known about seismic activity in these areas, that no one has raised, in any serious way, the matter of predicting a quake. In South Carolina and Nevada, the problem is to get under way some modest effort in preparedness. The difference can be seen in terms of the maturity of policy. In an advanced setting, earthquakes have been high on the government agenda for years, and any number of national, state, and local policies have been enacted. The current prediction/preparedness program in Japan rests on a considerable base of policy and institutional development.

In an emergent setting, the problem is not to build on an existing base, but to establish that base in the first place. The struggle in South Carolina and Nevada is to make earthquakes a priority for policy, to get it on the agenda, and to keep it there. In the advanced system of Japan, the earthquake entrepreneurs are policy makers--politicians and high-ranking bureaucrats. In an emergent system, they are largely outside the formal structures of government.

In South Carolina, the entrepreneurs are technical professionals, academics. They are working slowly and carefully in a conservative political system to educate the general public as to the threat.

Their hope is that they can get change by altering public attitudes. Public pressure will, in turn, impact on state government, and state government will respond. It is a slow strategy and requires external support from Washington and like-minded professionals in other states. They do not have the overt reminders of the threat that can be found in advanced systems or intermediate ones like California.

What can happen in an emergent policy setting, in the absence of public awareness and support, is seen in Nevada. Here, a policy process was set in motion from the top, via the governor. He had been triggered, not by an earthquake but by a friend in California who suggested a "performance gap" in his own behavior in this field. Nevada ought to be able to do more, he was admonished, and this governor agreed. He established a group of experts to examine the problem and recommend solutions. This group came up with a number of recommendations, including a call for a body similar to the California Seismic Safety Commission. This would give the problem an institutional presence in Nevada, and this organization could become a policy entrepreneur promoting further earthquake preparedness changes.

It may have been a good idea, but its support proved quite temporary. An election occurred before the policy process concerning these changes could move very far. The new governor dropped earthquake preparedness from the executive branch's agenda, and there was no champion strong enough in the legislature to carry the torch. If anything, there were negative feelings and indifference in the legislature. Belatedly, Nevada's earthquake entrepreneurs sought to bolster their position via a public campaign. But, it was too little, too late. The earthquake issue slipped slowly and quietly to a lower and lower priority, and may in fact today not even be on the state policy agenda at all. In fact, the entrepreneurs have mostly moved on to other concerns. How vulnerable earthquake policy is as an issue in an emergent setting is pointed up by the Nevada case.

The experiences of Nevada and South Carolina are useful, primarily in that there are lessons to be learned from these two emergent policy settings. To be sure, any jurisdiction which seeks to implement earthquake policy innovation must begin in similar circumstances. The Nevada case points up some interesting lessons:

1. A top-down strategy can initiate policy innovation but may not see it through, owing to the absence of an existing constituency (i.e., a coalition) for the issue.
2. Where such a coalition is absent, top-down strategies, based on political entrepreneurs, are vulnerable--simply because the elected officials who are the entrepreneurs are themselves often fleeting.

In South Carolina, of course, these same admonitions are valid, but the case itself brings up other lessons for the would-be policy entrepreneur:

1. Bottom-up strategies, based on the work of outside (the government) entrepreneurs is slow. While slow, it keys on the central problem, which is constituency (coalition building).
2. Ultimately, government officials will have to be drawn into the coalition in leadership capacities. However, if there is sufficient interest below, individual change at the top may not make that much difference.
3. Earthquake entrepreneurs outside state government may require nurturing from federal sources to get started.

California

Somewhere between Japan and South Carolina/Nevada in policy development is California. The threat of an earthquake cannot be ignored in the Golden State. There are too many reminders, some quite destructive. However, what is different in the advanced and intermediate settings is the greater commitment and priority the issue has in the former. California may well be facing an earthquake as catastrophic as is the Tokai region of Japan. But, California has not countered this discontinuous threat with a preparedness policy to match. There is progress, but it is incremental. The threat is perceived, but it is perceived as providing

time for a more gradualist policy. Unlike the emergent setting, there is state governmental decision. The issue is on the agenda, in a continuing way. There are governmental institutions and there are earthquake entrepreneurs in state government pushing from within, as well as those externally pushing from outside. The dilemma is how fast and how hard to push, and in what way.

What eventually became known as the Governor's Task Force was conceived early in 1980 when President Jimmy Carter and Governor Jerry Brown were vying for the Democratic presidential nomination. When FEMA and the California state legislature initiated what was to become SCEPP, Brown and his aides countered with an earthquake program of their own--the task force--for the 1981-1982 fiscal year. Private sector involvement was stressed in the establishment of a task force boasting over 30 separate committees, addressing various aspects of earthquake preparedness, and involving some 350 people.

The task force's objective was to achieve a high state of readiness for a major earthquake by July 1, 1982. Toward this goal, a five-step process relying heavily on private citizens was initiated.

1. Obtaining wide agreement on and understanding of the implications of a "catastrophic earthquake" (Threat Scenario);
2. In the context of that threat, evaluating a key group of current government plans (Plan Evaluation);
3. Recommending improvements in government plans (Annexes);
4. Expanding the network of private sector participation to earmark selected private resources and tactics (Outreach); and
5. Testing new public and private sector plans (Testing) with particular emphasis on an effective Command Center, clearly capable of managing both public and private sector resources.

As the director of the Governor's Task Force evaluated the effort, three significant steps toward readiness were achieved:

1. A single scenario of geological earth shaking and structural damage for both the northern and southern San Andreas faults was designed and mapped.
2. A strategy for response to that scenario was fostered for the whole society, with an emphasis on "self-help" in the initial hours following a great earthquake.
3. Steps to translate that strategy into pre-event actions in both the public and private sectors were taken.

Unfortunately, a great deal more was intended, and prevented from happening due to the inability of Governor Brown and state legislature to reach accommodation on a proposed large-scale (\$4.2 million) state program in earthquake preparedness. Further, when George Deukmejian succeeded Brown as governor, little money allocated to maintain the task force. Eventually, the task force survived, due to the concern of the Office of Emergency Services (OES), a state agency with a comprehensive interest in disaster management, including earthquakes. OES pledged to support the task force and two areas for future attention were agreed upon: (1) greater private sector involvement, and (2) more attention to direction and control elements. The potential of the task force revolved around the considered use of its strengths in bringing new leaders from various sectors of California society aboard an ever-widening earthquake preparedness coalition.

Already mentioned was the other earthquake entrepreneur in this intermediate policy setting--SCEPP. In 1980, the federal government and State of California, driven by the very real possibility of a credible earthquake prediction in the near future, established a project to better prepare southern California. While being established, the goals of the project broadened to include not just prediction but a catastrophic event. The goals were broad and vague. The organization established was new and temporary. It was an intermediary between the federal and state governments on the one hand, and the local governments and private sector on the other.

All told, SCEPP has proved a successful earthquake entrepreneur. It aimed at systems innovation--i.e., change in various units and in southern California as a region. There has been change toward greater preparedness at the local government and private sector levels, and greater regionwide change is being addressed. There is consensus that, in spite of serious organizational/political problems at the outset, SCEPP is achieving its goals. Four fundamental characteristics have contributed to this success: (1) able internal resources, (2) external resources and allies, (3) minimal opposition, and (4) leadership.

The able internal resources were the intelligent generalists that SCEPP recruited to add a high conceptual quality to the organization. Given SCEPP's mission to innovate in what was considered a field in need of new ideas, this was a desirable aspect of implementation. But the lack of substantive knowledge made it difficult for the SCEPP staff to deal with state or local bureaucracies or to prove that it had the expertise to lead others. Over time, SCEPP became more sensitive and careful. By 1984, SCEPP was a smoothly functioning, single purpose organization whose major problem for the future seemed to be how to avoid the danger of entropy.

External resources and allies are always crucial in the establishment of a new public sector organization. SCEPP had various potential allies from the beginning. It had FEMA at the federal level; Seismic Safety Commission (SSC), its policy manager at the state level; and Policy Advisory Board (PAB), the board of local, regional interests which provided policy guidance from this grass roots perspective. PAB gave representation to user, as well as other interests concerned with the southern California region.

Minimal opposition facilitated SCEPP's success. It had enough difficulties with its "friends" (FEMA, SSC, PAB, users) at one time or another, that it could have been severely injured if it had faced strong opponents. The organization that might have had the most

reason to oppose SCEPP--OES, on whose turf SCEPP tread--lacked support with the governor and legislature and thus had to step aside, at least in the critical formative days of SCEPP.

What SCEPP especially needed and eventually had was entrepreneurial leadership. This kind of leadership is a form of leadership that is different from traditional management of a government agency. It is a form of leadership that establishes a new course for an organization. Innovation was why SCEPP was created, and SCEPP could not have fulfilled its goals to the degree it did, had it not been blessed with entrepreneurial leadership when it was needed most.

Perhaps the greatest contribution that SCEPP made lies not with "what" but with "how." The specific characteristics of the SCEPP experience were:

1. an organization that came to be guided by "user-oriented" planning;
2. the involvement of elected officials and high-level public and private executives in the process of earthquake policy innovations;
3. the use of prediction response workshops to produce reports enriching the knowledge base for policy in the field, and to contribute to certain policy changes.

Three main shortcomings can be identified in evaluating SCEPP:

1. The focus on custom-tailored city and corporate earthquake response planning has meant system-wide (regional) thinking has had to wait.
2. Prediction was one of the priority reasons for the existence of SCEPP. But, as scientists themselves backed away from prediction, SCEPP has had difficulty promoting the need for prediction response planning.
3. Similarly, transfer was one of SCEPP's original goals. The more user-oriented SCEPP became (as the price of achieving success) it has produced products that must be adapted again for transfer. This takes time. The whole SCEPP experience points up how long policy innovation can take when system changes are at issue.

SCEPP is both a beneficiary of, and a contributor to the earthquake culture of southern California. SCEPP was born because there was a recognized need. SCEPP's existence and accomplishments have raised the degree of policy awareness still further. There is thus a growing earthquake constituency on which SCEPP is able to build. SCEPP was able to push preparedness because there were users who knew, in their heart of hearts, that they ought to be doing more. There is now a model for earthquake entrepreneurship in the United States. Those who would seek to follow the SCEPP example have an experience from which to draw in making their own decisions--to imitate, adapt, or depart.

The particular factors that led to the creation of the task force and SCEPP, and the implementation of certain of their policies, were many and diverse. What is clear is that one of the most important triggers was Mount St. Helens. This proved--in a way President Carter, Governor Brown, and many others could see--that a truly great natural disaster was possible in the United States. More than business as usual preparedness was needed--especially since the scientific community was now placing a great southern California earthquake within the realm of 50 percent probability within 30 years.

SCEPP, an intergovernmental, public-private project, and task force, a state project, were launched. Both were established as catalytic organizations, but SCEPP was more a traditional project organization, whereas task force was an assemblage of working committees. Both began with a strong sense of urgency and a sense that very large policy changes were necessary. Both, over time, became less ambitious (or more realistic) in their goals.

California has settled for something less than discontinuous change, but more than business-as-usual incremental change. There has been a significant move forward in preparedness. But not one adequate to meeting the challenge a great earthquake or, as was initially hoped,

prediction of one. What has happened in the intermediate setting of California is a more gradualist "success-so-far" type of earthquake preparedness.

The goals are still there; it is just that they are being met more slowly than those who take the threat of a catastrophic quake seriously might have hoped. There is no scientific certitude that the great earthquake is imminent. Consequently, the California system is behaving as though there is time.

Conclusion

When all is said and done, it is the credibility of the threat that distinguishes the advanced, emergent, and intermediate systems. Japan, having experienced genuine catastrophic disasters of different kinds, knows that it must take a great earthquake seriously. It does so in policy-relevant ways. Its already substantial preparedness was accelerated further by a prediction deemed credible of a great Tokai quake in the not too distant future.

In South Carolina, which has not suffered a serious earthquake since the 19th century, and Nevada, where no one has died from an earthquake in historic times, there is a difficulty for the average person to give earthquake threat a high priority. California represents a situation that is in between. There is concern, enough concern to keep policy preparedness a constant on the California agenda. The issue is whether that concern is sufficient for the great earthquake that comes infrequently, but which is now coming due in terms of historic recurrence intervals.

The credibility of the threat sets the boundaries for what is possible in policy. In each system, policy movement depends on the nature and capacities of various earthquake entrepreneurs. In the advanced system of Japan, entrepreneurship has been internalized within the bureaucracy, and even among some elected officials. In the emergent system of South Carolina and Nevada, the earthquake entrepreneurs are outsiders, trying to get the insiders to pay

attention. In California, there have been temporary organizations that have played the entrepreneurial role, seeking to instill a greater urgency for the "big one" and thus raising the level of preparedness significantly. Temporary organizations like SCEPP and the Governor's Task Force can do only so much. They can push only so hard. Ultimately, their sense of entrepreneurship and priority must be transferred to the regular governmental apparatus. Preparedness has to become a case of continuing policy innovation.

PART II

INTRODUCTION

This is a study of the process of policy innovation in earthquake preparedness. It is a study of how new products and processes are brought into being and used in the earthquake preparedness field. Preparedness innovations may involve hardware, but they are primarily concerned with "softer" innovations. Such innovations entail changes in plans and human action. Hence, this is mainly a study about the development and initial application of social technologies. Even more so, it is a study of the organizations and individuals that bring those social innovations about. Taken as a whole, we call these technologies and associated processes "policy innovations" because they are the direct result of public policy aimed at creating significant change in the level of preparedness in the earthquake field.

How are such innovations developed, adopted, and used? Who moves them forward? How? What are the barriers along the way? To help answer these questions, we have studied the process of earthquake innovation in three policy settings. The first, we call the emergent setting. It is one where individuals are seeking to get earthquake policy on the agenda of government, and establish some kind of organization to carry out the task of advocating preparedness on a more permanent basis. The emergent settings studied are South Carolina and Nevada. There are seismic threats in both places, but the level of policy concern is relatively low. Activity and innovation reflect this fact.

A second case chosen illuminates issues in an advanced policy setting. Here, the threat is well established and so is the policy framework to cope with that threat. Social technologies are institutionalized through government agencies and programs that have a high

priority and stability. A case of earthquake policymaking in Japan is used to illustrate the dynamics of the process of earthquake innovation in an advanced setting.

Finally, there is a middle or intermediate policy setting. It is relatively developed in the sense of having policy and institutions to deal with the earthquake threat. But, it is not yet as "complete" or routinized a system as is a mature setting. Funding is low and/or uncertain. Institutions are precarious. There is a sense of tentativeness about political commitment, and issues of who does what, how, and when are unsettled. California represents this kind of policy system.

In the emergent system, the moving force behind innovation (the entrepreneur) is an individual or small group. In the advanced system, the entrepreneur has an established bureaucratic structure, and many innovations in this field have largely been institutionalized. Changes still take place. But they build on a well-established policy base. In the intermediate system, the earthquake entrepreneur may well be an organization, but it is generally not an especially well established one. It is vulnerable. Insecurity is a burden it must bear, along with the drive for policy innovation.

Most of the present study deals with the intermediate earthquake policy system of California. The reason is that the writer has played the unofficial role of outside monitor for the Southern California Earthquake Preparedness Project (SCEPP). SCEPP was established as an earthquake project in southern California by the federal government and California. Its function was to stimulate preparedness for a predictable or unpredicted earthquake. It was seen by both California and the Federal Emergency Management Agency (FEMA) that what was being attempted in California was itself novel and experimental and worthy of documentation along the way. SCEPP's process and products would constitute a social technology potentially transferrable elsewhere. A documentation would permit better evaluation of the process and its possibility for transfer. The request went to the National Science Foundation (NSF) which had just

awarded us a grant to do research in California and selected other states on earthquake policy innovation. It was natural for us to respond to this request. It did reorient the original project, but in ways deemed desirable by everyone familiar with what was being done. The reason is that some innovations are more important than others, and SCEPP is generally regarded as perhaps the most significant institutional innovation to take place in earthquake preparedness policy in many years.

To accomplish this project, it became necessary to develop a "real-time" social science strategy for accomplishing the work. It was required that we track the decision making process as it occurred. This necessitated being close to decision making without influencing decisions. The aim was to capture the sense of decision alternatives, pressures, and options for choice. Decision making is messy and convoluted. Those interviewed are to be congratulated for their cooperation, candor, and courage. Everyone was aware that what was happening in southern California was important. The SCEPP process might "work" or it might not. No one knew the end of the story. But all believed the story was extremely meaningful, and that they were participating in a sequence of events of more than passing significance. The California case inevitably became the bellwether for the entire project, leading to the trip to Japan for comparative purposes. In effect, SCEPP was America's prototype for an earthquake entrepreneur. The attention SCEPP's strengths and problems in catalyzing policy change receive in our report reflects this central fact.

Approach

Regardless of whether we are studying an emergent, advanced, or intermediate earthquake policy system, we use the same conceptual approach. This is one that links policy actor with policy process. Policy is a process that occurs over stages. At different stages, various types of actors tend to be active. They play similar roles. Who plays these roles varies with the policy at issue and nature of the society being studied. In an advanced and relatively small

earthquake system like Japan, for example, earthquake issues are national in scope and involve policy level participants at the national, as well as prefectural and local levels. Their involvement in the issue is likely to be frequent and intense. In an emergent system, such as South Carolina or Nevada, participation is primarily at the state and local level. The involvement of policy officials is less likely, less frequent, and less intense. In the intermediate system of California, there will be national, state, and local activity. Policy officials will be involved, but that involvement is not at the frequency or intensity seen in an advanced system. Earthquakes are a national priority in Japan. In the United States, there is national policy, but not national priority.

The level of policy development in a given political system is a function of the perceived seriousness of the problem in that system. If the problem is perceived as quite serious, it will have a priority. If not, it will have a lesser priority or be in the position of struggling to have any priority at all.

Again, the process is the same in different political systems. The roles involved in the process are similar. What is different are who plays those roles, and the absence of some players in particular essential roles.

Process

1. A given policy innovation process begins with an awareness by an individual or group of a major problem or opportunity requiring governmental action in the earthquake preparedness field. This awareness stage can be lengthy. Often, there are only a few individuals who share and actively promote a particular concern. These individuals who are the entrepreneurs in the awareness stage may or may not be in government.
2. Required is a trigger--a stimulus to move awareness to policy action of some kind. The trigger causes the issue to go from the backburner to an item of governmental concern, even priority.
3. A process of search/planning for an appropriate response unfolds. Initially the search is general, but gradually it narrows to specific options.

4. An option for policy is proposed for adoption by government. Adoption requires a conferring of legitimacy, usually by elected representatives of the people. It also generally involves funding.
5. If adopted, a policy must be implemented. The policy becomes a program, and the program goes into an existing organization or becomes the base around which a new organization is formed. Implementation can be divided into two basic phases: (1) early implementation, in which program design and staffing are major concerns and (2) later implementation, in which program execution becomes critical. It is during this later implementation phase that policy is translated into program action, and, in the earthquake field, social technologies are developed and utilized.
6. Finally, there is incorporation, the end of implementation, when a program is completed and ceases to be innovative. In many government programs, incorporation (institutionalization) entails a transfer of control of the new products and processes from the innovating to the using organization. In the process, the user organization adapts the technologies, and is, in turn, changed by them.

The above is potentially quite a long process. It is also quite complicated. It may take many, many years and be interrupted along the way. Any stage can include innumerable substages. It is no wonder that true policy innovation is the exception rather than the norm in government. Entailed is not one innovation, but many innovations of different types: legislative, organizational, programmatic. It is an upsetting process, one that individuals, organizations, and political systems can endure only to some degree. Innovations may fail, and failure entails risks to all the parties involved. Finally, innovations are not necessarily all in the public interest. Opposition to innovation may be warranted. It may be essential not only to stop deleterious innovations, but also to modify those that are being developed to make them more acceptable to those who are their ultimate users and beneficiaries.

Roles

Who makes innovative earthquake preparedness policy happen? The answer is many. But, who are they? The answer is that there are certain basic roles that are involved in any innovation policy process. These roles are played by organizations and individuals. At minimum, the roles are two: developers and users. The developer is the organization that creates the innovation. The users are those who are the clients of the new products and processes that are being brought into being. If the world were less complex, developers and users would be sufficient for decision making. However, the world is complicated. Because of that fact, there are innumerable other roles that are involved in speeding up or slowing down the innovation process. For example, there must be sponsors--who pay for the development and who are often outside of both users and developers. There may also be opponents, who do not want the innovation that is being developed for one reason or another, or who think that it must be modified to be made more acceptable. There may also be beneficiaries--for example, the general public. Beneficiaries may not actually participate in a given decision by a developer or user or sponsor or opponent, but they are affected by decisions and in turn can influence them indirectly by their attitude.

Finally, there is a role that is most critical to any innovation process. This is that of the entrepreneur. The entrepreneur is the moving force for change. It is a role that creates change through political coalition building. Any of the above actors can also be an entrepreneur. Often, who is the entrepreneur changes over time. This is especially the case where policy innovations are at issue. The sponsor is the initial entrepreneur, but gives way to the developer as the process moves forward. As institutionalization takes place, the user must become the entrepreneur. Finally, when the innovation is no longer perceived as new, there is no need for an entrepreneur. The role disappears when the process of innovation is complete.

It is obvious that policy innovation is a political process in organizational and personal terms. Issues of stakes, resources, status, and power are indeed involved. There are alliances and counter alliances. Organizations act in a political environment. Individuals succeed or fail in their ability to create linkages and span boundaries.

In the cases narrated in the following pages, it will be seen that entrepreneurs take different forms. The players in the roles vary. In South Carolina, the principal entrepreneurs are not in government at all, but in universities. In California, the principal entrepreneur is a project organization, an entity created to deliberately foment change. It is an organizational entrepreneur.

In Japan, there is no need for a special project organization to be specially created to catalyze change. The earthquake entrepreneur is in government itself. Indeed, there is a political leader who is himself an entrepreneur--a "Governor Earthquake" who symbolizes the priority of this problem in a nation at the mature stage of policy development. Bolstering him is an agency that is a bureaucratic entrepreneur. It has managed to retain its innovative drive over years and successive shifts in personnel.

Thus, there is the critical difference in policy systems in who fills the entrepreneurial role. The higher the priority of earthquakes, the higher in government, and more a continuing part of government, will be earthquake entrepreneurship. What all entrepreneurs have in common is the need to build supportive coalitions--of sponsors, developers, and users--into a system for innovation. To do that, entrepreneurs must overcome the twin adversities of apathy and active opposition. They must also survive--for what is clear is that entrepreneurs "make waves" and thus draw criticism. Also, as noted, innovation takes a great deal of time. It is not for the fainthearted or easily discouraged.

PART III

AN EMERGENT POLICY SETTING: NEVADA

Introduction

Nevada is one of the nation's three most seismically active states, but neighboring California far overshadows the Nevadan threat in the public eye and makes public policy in support of disaster mitigation measures there difficult to obtain. People assume that there are no earthquakes on the eastern side of the Sierra Nevadas. Unlike California, Nevada's earthquake threat involves vertical movement, and, hence, vertical displacement. This means that the technical understandings about Californian quakes are not necessarily applicable to Nevada's situation. To date the state has been completely nondirective in the area of seismicity. The Uniform Building Code does not mandate seismic standard conformity, and local plans do not require consideration of the underlying fault structure. In part, this nonchalance stems from the historical absence of planning within the state. But much is simply the fact that people do not believe the threat is significant enough to warrant action.

While major earthquakes are relatively infrequent, the University of Nevada at Reno's (UNR) Seismological Laboratory records several thousand tremblors annually. The last four major earthquakes in the state were part of the 1954 Rainbow Mountain-Fairview Peak-Dixie Valley series, which registered 6.6, 6.8, 7.1, and 6.8 on the Richter scale. Because of the location of these quakes, in remote areas, there was no harm to people. However, major faults run through or near populated areas, such as Reno and the state capital, Carson City. Moreover, the population rate of growth in Nevada has been rising rapidly. Finally, there is always the possibility that a quake will take place when the populations of Reno and Carson City have been swelled considerably by an influx of tourists.

Nevada's geology displays evidence that quakes of the magnitude of the 1954 events are likely to recur every 50 years or so. This evidence includes the Genoa Fault in Carson Valley; a scarp which cuts through the middle of Carson City; a series of parallel scarps in the Callahan Ranch area; and another scarp running under Reno City Hall. All of these geological formations pose a very real threat to highly populated areas.¹

Thus, it can be concluded that a number of factors combine to determine the earthquake hazard in a particular area: (1) the magnitude of the event, (2) the location of population centers relative to the epicenter, (3) the ability of buildings and infrastructure to withstand the unusual motion, and (4) the type of bedrock and soil on which these structures stand.² Thus, a comprehensive mitigation strategy would need to include research to determine the details of the physical hazard and the actual threat to life and property given the status quo. This would ideally be followed by mitigation strategies which address both structures per se and their sitings, heighten public awareness to encourage individuals to prepare for an earthquake so they are able to correctly handle the emergency, and to enact public policy that would lead governmental jurisdictions to solidify disaster response plans.

Awareness

From 1970 to 1978, Nevada had as its governor Mike O'Callaghan. O'Callaghan had spent many years as an administrator in the emergency field. He had been a regional director of the FEMA predecessor organization, Office of Emergency Preparedness. In

1

"Earthquake" #1, p. 1, Gil Cochran, ed. (a series of 10 bulletins designed to promote earthquake hazard mitigation in Nevada.)

2

"Natural Hazard Analysis: Geology and Climate," State of Nevada: Civil Defense and Disaster Agency, September 1978. p. 13.

fact, he was instrumental in putting FEMA together, and was offered the body's directorship by President Carter. While very much aware of the earthquake threat, O'Callaghan was slow to move owing to an agenda already burdened with long-term projects and day-to-day crises.

Trigger

Then, on July 1, 1978, O'Callaghan received a note from Robert Olson, the executive director of the California Seismic Safety Commission (CSSC). Olson was a personal friend, and a man who years before had worked for O'Callaghan in the emergency management field. Olson noted that California was active in earthquake preparedness and Utah and Montana, among other states, were also becoming active. "We are 'surrounding' you," Olson wrote to O'Callaghan. He asked the governor--and his one-time boss--when he was going to get moving on earthquakes. This letter was trigger enough for O'Callaghan. He questioned his staff on Nevada's activity vis-a-vis earthquakes. Two days later, Nevada's Director of Civil Defense sent O'Callaghan a memo outlining what would be presented as Nevada's state policy at the mid-month Council of State Governments National Earthquake Committee meeting. The governor directed his science advisor, Gil Cochran, to act on establishing a committee to study and propose needed new policies in conjunction with the Civil Defense Department. Cochran was a civil engineer/hydrologist on leave from the University of Nevada's Desert Research Institute (DRI). He was personally and professionally well aware of Nevada's earthquake threat and very much interested in working on a project that might lead to greater preparedness innovation. On July 6, the Administrator of the Federal Disaster Assistance Administration (FDAA) wrote to encourage O'Callaghan to review the readiness of Nevada and local agencies and private citizens for coping with earthquakes, and to offer FDAA assistance for the process. O'Callaghan thus made a decision to push ahead with a strategy for improving Nevada's preparedness for earthquake disaster.

Establishing the Ad Hoc Panel

The first step for Cochran was his submitting a proposal to the Four Corners Regional Commission. The proposal requested \$20,554 as a technical assistance grant authorized under Section 509 of the Public Works and Economic Development Act of 1965. Cochran was listed as the project director for the 10.5-month project which was slated to run from August 15, 1978 to June 30, 1979. The grant was enough to hire an assistant and a secretary, with additional operating money for travel. Cochran was frustrated dealing with the administrative and financial details of the operation. In addition to the Four Corners money, there were other contributions of \$4,000 from NSF, \$17,000 from the University of Nevada, and some planning money from HUD. All in all, Cochran raised \$45,000 of "working capital" to get started.

As the Four Corners proposal explained, the grant was to finance the beginning of Nevada's formal earthquake preparedness effort. "This project will support the activities of an Ad Hoc Panel on Seismic Hazard Mitigation established by the governor to survey, review, and make recommendations regarding earthquake hazard mitigation procedures and earthquake damage contingency planning within Nevada. The panel will also address the questions of how Nevada will respond to the National Earthquake Hazards Reduction Program and how the state will interact and coordinate with programs of the other states in this region." In accomplishing this broad mandate, the Ad Hoc Panel would address six distinct tasks:

1. Review and evaluate current status of earthquake disaster contingency planning and development recommendations for improving preparedness.
2. Review, evaluate, and make recommendations regarding seismic hazard mitigation procedures, policies, and standards in the areas of building codes, zoning, and land use.
3. Analyze and provide recommendations concerning the need for continuing communication and coordination relative to seismic hazard mitigation and how this might best be accomplished.

4. Develop new or modifications to existing legislation deemed necessary to resolve any identified deficiencies or problems.
5. Identify and make recommendations concerning needed information and educational programs relative to seismic hazards.
6. Identify and establish priorities for needed research and data collection programs within the scope of state or local jurisdictions.³

The establishment of an Ad Hoc Panel was given O'Callaghan's approval on August 4, 1978. It was modeled after the CSSC, and was to formulate a public policy framework for the Nevada legislature to use when it came time to consider legislative and executive policy adoption. The Ad Hoc Panel, whose 10 members represented a broad spectrum of expertise and callings from around the state, was to provide an interim report to the governor and to the 1979 Nevada legislature by the end of December 1978, and to conclude its activities by June 30, 1979.

The Ad Hoc Panel was headed by John Bonell, retired former chairman of the Civil Engineering Department of UNR. Bonell was familiar with the earthquake issue from his education at CalTech and his structural engineering work in Los Angeles. He had pioneered a 1966 training session for teachers that dealt with the earthquake threat. This effort was funded by NSF.

A principal staff person for the Ad Hoc Panel was Merilly Kronberg, a middle-level administrator with a geology background from the State Civil Defense and Disaster Assistance Agency, Nevada's principal emergency management organization. Kronberg officially joined the project in October 1978. She had contributed unoffi-

3

"Proposal for Technical Assistance Grant for Development of a Seismic Hazard Mitigation Program and Plan." Nevada: Office of State Science Advisor. August 7, 1978. pp. 6-7.

cially to the effort since September, after being enlisted by Cochran. Her main role was one of research and administrative support.

Advising the Ad Hoc Panel at the beginning of its work were Robert Olson and Karl Steinbrugge, two of the original moving forces behind the CSSC. Steinbrugge was the first CSSC chairman, and Olson its only director up to this point. They believed in the SSC as an organizational innovation, and wanted it transferred to other states with seismic threats. The panel itself was chosen to represent a variety of Nevada's interests. It was enthusiastic and well organized under Cochran, and had all the potential to be highly effective.

In late August, the Ad Hoc Panel convened in Carson City for its first meeting. It discussed its mandate and how it might discharge its responsibilities. Eleven work groups were established at this meeting to independently address specific topics prior to the preparation of a report to the governor. The 11 subcommittees addressed the following components of the mandate:

1. legislative
2. building codes
3. risk mapping
4. research and data collection
5. earthquake prediction
6. lifelines (utilities)
7. disaster preparation and response
8. land use
9. socio-econ-political considerations
10. critical facilities
11. information, education, and training⁴

4

"Ad Hoc Panel on Seismic Hazard Mitigation Report on Conclusions, Recommendations, and Findings." State of Nevada: Governor's Office of Planning Coordination. June 1979. p. 2.

Each of these subcommittees selected a chairman who agreed to work closely with the panel members. All told--panel members, task force members, and staff--there were about 65 people working on seismic hazard mitigation for the state of Nevada.

The work groups were prepared to present reports by the second panel meeting in Las Vegas on October 28. The panel discussed the reports and provided useful criticism. Interim reports were required of all of the work groups for consideration at the next meeting. This meeting took place on December 8 in Reno. Eight of the work groups were ready and identified a total of over 40 items for consideration by the panel in preparing its recommendations for the governor and the legislature. Five of these items became recommendations of the panel. The remaining items stood as observations or conclusions of the panel. These would receive additional attention by the panel before it adjourned in June 1979. Some items referred to the panel's work group on legislative considerations for analysis and preparation of draft legislation, but this was not emphasized. Bonell later asserted that, "Our charge does not involve getting legislation ready for the 1979 session," and his feeling was clear from the outset.

The Ad Hoc Panel Proposals

The panel, in brief, had found that the seismic safety efforts in Nevada were in a considerable state of disarray, with little or no communication and coordination, and that needed programs were not being undertaken or were underfunded. The panel's number one recommendation was that the state establish a Seismic Safety Council with a five-year life to try to bring "order out of chaos." The establishment of such a NSSC was regarded as basic. Other recommendations included:

1. The 1979 Session of the Nevada Legislature should revise HRS 278.160 to require preparation of a 'Seismic Safety Plan' as an element of city, county, or regional master plans.

2. The state of Nevada should substantially increase the next biennial appropriation to the Nevada Bureau of Mines and Geology and authorize increased staff for the express purpose of accelerating the Bureau's seismic hazards mapping program.
3. The state of Nevada should adopt as state law the 'seismic' provisions of the latest edition of the Uniform Building Code as promulgated by the International Conference of Building Officials and require its application without exception in all political subdivisions of the state.
4. The state of Nevada should establish within the Nevada Bureau of Mines and Geology a 'Center for Seismic Hazard Assessment Data' in order to achieve and make available all such data developed by all public and private entities within Nevada.⁵

There were a number of reasons for the panel to stress the adoption of a Seismic Safety Council over the other recommendations. Primarily, it was believed that without such a council there would be no action on any of the panel's suggestions. As Charles Thiel--head of the Earthquake Hazards Reduction Group of the Federal Office of Science and Technology Policy (OSTP)--wrote, this stems from two basic tenets:

1. having taken on such a large task, the incompleteness of some conclusions will cast doubt on others, and
2. there will be no focus for response and illumination as the recommendations are publically debated.⁶

On January 19, 1979, the panel met for the fourth time to give final approval to the report. At this point, three additional recommendations were accepted.

O'Callaghan had been pleased to receive the interim report on December 26, 1979. However, he had, since initiating the search and planning process of the Ad Hoc Panel, been rendered a "lame duck."

5

Ibid., pp. 3-8.

6

Letter from Charles Thiel to Robert Hill, Nevada State Planning Coordinator. January 26, 1979.

The election for governor had taken place in November and O'Callaghan had not run. A new governor, Robert List, would be in office in January. O'Callaghan had copies of the report sent to Governor-elect List, all members of the 1979 Legislature, and the press. The difference between the O'Callaghan administration and the List administration was stark. The new governor was not at all interested in the earthquake issue. Constrained by his initiative, the disaster people could do little. The agency at that time did not want to incorporate the program for fear of jeopardizing its other programs. In fact, Bonell was unable to meet with List, and could not even prompt a return telephone call.

Rejection

Governor O'Callaghan had given seismic safety a high, if belated, priority on his agenda. Governor List dropped the issue to a low or non-priority. He came into office with the intent of holding government costs down and avoiding new programs that were not absolutely urgent. This became especially obvious when the federal government denied Nevada the \$250,000 it had been allotted for a broad natural disaster program, since the state would not also provide funds in support of the program.

The new governor obviously did not see the urgency for a Seismic Safety Council. Nor did he see the need for a science advisor. Cochran, the principal entrepreneur behind the panel, resigned and returned to DRI. The resignation was sparked, not only by the governor's indifference, but also by the tension between himself and some of the planning coordination people (not to be confused with the State Planning Office, another state agency). Although his resignation was not accepted, he dropped out of government. Informally, however, he continued to run the panel through Kronberg, who remained a steadfast ally.

The Ad Hoc Panel did not give up. It took its case to the legislature, once the governor's position was clear. This first encounter took place in early 1979 and primarily consisted of an information exchange between the panel and a few potentially interested legislators. There was some legislative support, but not enough. The 1979 legislature adjourned without considering the proposed legislation or any of the panel's other recommendations. The panel could do little except publish its final report and conclude its activities in June 1979. This conclusion involved conducting a Carson City disaster drill in February and hosting a workshop for seismic safety and building officials on June 14-15, as well as being involved in various multi-state and federal discussions. A process of earthquake preparedness decision-making had moved to a point short of adoption in Nevada. When that point had been reached, there was no decision made to go further. No decision meant, in effect, rejection.

Keeping the Issue Alive

Still, Cochran did not want to accept defeat and he allied himself with the Reno chapters of the Nevada Society of Professional Engineers, the American Institute of Architects, and the American Planning Association to keep the issue alive during the period between legislative sessions. A small public awareness program kept legislators, local politicians, and the newspapers abreast of the earthquake issue. This educational campaign also involved public discussions in which scientific and technical professionals attempted to convey to citizens the dangers they faced if a major earthquake hit the Reno-Carson City area.

In the summer of 1980, material was sent to the bill-drafting division of the state legislature with a request that a number of seismic bills be prepared. In January 1981, the draft of a single bill incorporating a great diversity of concerns was submitted. The strategy was to avoid any big money item. The following elements were among those included:

bill incorporating a great diversity of concerns was submitted. The strategy was to avoid any big money item. The following elements were among those included:

1. The restoration of the Nevada Seismic Safety Council (the ad hoc committee) as an independent entity reporting only to the governor and the legislature. It would have the members and an adequate budget and mandate to fulfill various earthquake mitigation responsibilities.
2. Funding to speed up the seismic mapping activities being undertaken by the Bureau of Mines and Geology, UNR.
3. Funds for the expansion of the seismological network.
4. Provisions to make mandatory the seismic elements of the Uniform Building Code, both for the state and for all subdivisions of the state.
5. Provisions for a mandatory seismic element in all comprehensive plans.
6. The development--or expansion--of a seismic information system to which people would be required to send information of a seismic nature and which would be accessible to the public.⁷

The cost of this legislative package was \$376,000 for two years.

Rejection Again

The bill seemed to have wide support with no strong opposition, but minimal funds. A redraft which included only the restoration of the Seismic Safety Council, funded at a minimal level, was introduced. But it was blocked from getting out of the relevant funding committee by Floyd Lamb, a powerful legislator from the south who declared that seismicity was not a problem in the state. This declaration came after he asked Cochran at a public hearing: "How many people have been killed by an earthquake in Nevada?" and heard the reply: "None yet." The request was slowly but steadily whittled down to \$10,000 per year for the establishment of a Seismic

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Nevada Senate Bill No. 123, Committee on Government Affairs.

Safety Council for a two-year period. But Lamb killed that too. There were few proponents in favor of spending for earthquake preparedness, none willing to engage Lamb in fighting for a bill.

Epilogue

As Cochran and Kronberg both assert in retrospect, they had grossly misjudged the potential impact of the media and, hence, failed to tap it as a political resource. Very few press briefings were held and these were all too little, too late: after the legislature had stifled their initiatives. The political naivete of the earthquake entrepreneurs during the early years of the panel could not be recouped.

For all intents and purposes, this dialogue marked the end of the 1981 legislative effort. The legislative mood, if anything, was worse for new programs in this year than it had been in 1979. This second wave of effort had left nothing in its wake for Nevada earthquake entrepreneurs but frustration, and a resolve to try yet again. What they needed to convince the politicians that Nevada had a serious earthquake problem was an earthquake. They did not have one when they needed it.

Lamb was later sent to prison for three years for accepting bribes, and hence dropped out of the opposition picture. However, there was little change in earthquake acceptance in the legislature. The situation was exacerbated by the fact that both Cochran and Kronberg bowed out of earthquake entrepreneurship for personal reasons in the spring of 1983. At the same time, two new names--Dennis Trexler and Elaine Bell, from the Museum of Natural History, University of Nevada-Las Vegas--emerged. These individuals were trying to get funding for a project to complete a natural hazards map that would be at the heart of a state vulnerability study. If they did get funding, it would be from federal sources. Within the state

government, there was very little support for earthquake preparedness as of fall 1984. More and more, the momentum of the Ad Hoc Panel was ebbing.

PART IV

AN EMERGENT POLICY SETTING: SOUTH CAROLINA

Introduction

While the earthquake threat is well documented, and ingrained in Californian policy, South Carolina has given the issue relatively little attention. This is largely due to the fact that large earthquakes are relatively infrequent in South Carolina. But the extent of the geographical area that would be affected by a major earthquake in the southeastern United States far exceeds that in California. The exact extent of damage would depend on the magnitude of the quake, the "rate at which the amplitudes of body and surface seismic waves alternate or rather decrease with distance from the epicenter."¹ Aside from whatever immediate devastation an earthquake could cause, the disruption to lifestyles caused by shattered infrastructure--power, water, sewerage, communications, and emergency facilities--would be severe.

Awareness

On August 31, 1886, Charleston, South Carolina experienced such an earthquake which killed 27 people directly and as many as 67 indirectly. Property damage was enormous. Seven aftershocks caused additional devastation within the next 24 hours. Five million square kilometers were affected, with the greatest impact in the Charleston area. For about 20 years, seismic activity in the area continued.² A similar quake today would be much more devastating,

1

Charles Lindbergh. "Earthquake Hazard Preparedness in the Southeastern United States: A Patient Revolution." Unpublished paper, May 1983. p. 1.

2

Ann DeWitt Watts, "The Potential for Earthquake Policy in South Carolina: A State in the 'Awareness Stage'." February 10, 1982. p. 16.

given population growth and the lack of effective building design to withstand quakes. Further, the presence of nuclear fuel processing and storage plants as well as reactors exacerbates the threat.

As a state, South Carolina is certainly aware of its earthquake history. There are tremors, usually quite small, that are felt in the state from time to time. For example, in 1974, there was a 3.8 magnitude quake near the Baptist College of South Carolina. A 3.0 event occurred in January 1977, with one or two small tremors being noted in each successive year. Tours of Charleston include references to the quake and point out lasting evidence of its impact. Though it took place less than 100 years ago, the quake is treated in South Carolina as though it were an aberration. The state government does not act as though the prospect of recurrence in the future is likely, at least not in the political lifetimes of present office holders. Officials who feel this way may be correct or they may be wrong. The scientists do not know, and so little research is taking place on the earthquake threat in South Carolina, that there is little likelihood that an answer will be provided in the near future.

There are a number of reasons why earthquake research and policy incorporation have been slow to develop on the east coast in general and in South Carolina in particular. The most clear reason is that without a major event firmly fixed in people's minds it is difficult to treat the earthquake threat as a priority. Without an event, it is hard to get attention. Other kinds of disaster events must be utilized to piggy-back the earthquake issue. Another dilemma is that South Carolina officials--especially those in Charleston where the threat is greatest--believe that they may be adequately protected by virtue of various natural disaster precautions. An illustration of this perception is the contention that building codes mandating structural soundness designed to withstand hurricane-force winds will be effective in minimizing seismic damage. Also, the importance of historic preservation in Charleston poses problems in meeting seismic standards. Finally, the desire to attract commercial activity to the area may work against the need to raise public awareness to the threat, and enforce building codes.

Generally, the governments of South Carolina and Charleston have offered little support for earthquake legislation. Traditionally, the state has been conservative in regulating land use or otherwise acting in an interventionist fashion. This tendency is reinforced by a legislature-dominated political structure. Further, local governments have not participated in planning activities until recently. Nuclear Regulatory Commission (NRC)-United States Geological Survey (USGS) sponsored research, being undertaken through the University of South Carolina and Clemson, stands out as a lonely achievement. In the early 1980s, there had not been even a hint of policy action on the part of the government. Thus, the risk of an earthquake is deemed "acceptable." There are many parts of the state that are not seismic and there are other natural hazards that demand much greater attention (for example, hurricanes, tornadoes). There is minimal institutional development at the state level for emergency preparedness. And what there is, has not been earthquake oriented.

South Carolina has significant technological hazards as a state. It has a relatively large number of nuclear power plants, as well as one of the nation's three low-level nuclear waste burial grounds. Through nuclear siting decision, seismic safety can be considered. Thus far, awareness of an earthquake threat has not arrested nuclear development. Present-day South Carolina earthquake policy is analogous to California in an earlier period of the twentieth century. There was a time when many California leaders preferred to talk about the San Francisco fire, rather than the quake of 1906, and avoid discussion of seismic threat in the interest of economic development. Reality, however, caught up to California. Exactly what is the reality in South Carolina has yet to be demonstrated. Still, there has been some beginning preparedness activity in the City of Charleston, County of Charleston, and Town of Summerville, a suburb of Charleston. It is in this region that the threat is greatest.

The existing building codes recognized by the state have a permissive seismic element. In fact, there are only about two lines which address the issue in the codes. Charleston County, as well as the two major cities in the county, Charleston and North Charleston, all subscribe to the Southern Standard Building Code. Section 1206 of this code deals with seismic standards, but it is optional. Charleston chose to add 1206 to the books in July 1981. This was prompted by the county's hiring of an out-of-state building inspector earlier that year, who was compelled by his sense of professional responsibility. No enforcement problems have been noted, and the amendment is not retroactive. Local developers have nonetheless challenged the new seismic requirements and forced the City Council to clarify the legal authority of Section 1206's enforcement. This done, the amendment stands. In the same year (1981), another building inspector, in the City of Charleston, got his local leaders to reaffirm the provision. It had previously been included in the local codes, but, it appears, not strongly enforced. North Charleston has shown no signs of adopting this precautionary measure.

The South Carolina Entrepreneurs

There is thus some evidence of adoption of seismic preparedness measures, but it is largely at the local level. At the state level, which is our principal policy concern, there is modest activity directly related to earthquake problems at this time. There is interest by the state geologist and some members of the state personnel board, but for the great majority of state officials the issue is a non-issue. Those who are working hardest to upgrade this low priority are not to be found at the state level. They are inside the state, but outside the government. Or, they are inside the government, but outside the state.

The South Carolina entrepreneurs are drawn from the scientific and technical community. One is Professor Joyce Bagwell, who is a member of the Geology Department of the Baptist College at Charleston and, as of March 1976, is monitoring seismic activity at

interested in building and maintaining networks than in making the public aware of the earthquake threat. But, in 1981, she realized that this was a major need. While she still devotes much energy to her technical job, she has made herself available to speak to community schools and government groups as well as to exhibit the seismic research equipment. Aside from personal commitment to the earthquake issue, she volunteers her time and money to present programs on S.C. Low Country Earthquakes. A dynamic advocate of earthquake awareness, Bagwell has become an active public speaker and is popular with the media. She has not attempted to mount a strong lobbying effort in this very conservative state, having apparently concluded that she can achieve more through long-term, indirect methods of enhancing awareness among the affected parties--particularly the general public.

Also active is Dr. Charles Lindbergh, head of the Civil Engineering Department at the Citadel, located in Charleston. He had been aware of the earthquake issue as a child. After retiring from the Air Force he returned to South Carolina. In 1981, he also became convinced he should "do something."

Lindbergh is persuaded that there is a genuine earthquake problem in his state and that he should seek to facilitate the transfer of techniques and policies from other parts of the country where the threat has been given policy innovation. Like Bagwell, he favors a gradual and incremental strategy of raising the level of the earthquake issue. However, he is more willing to go directly to government, whereas Bagwell goes to the people.

Trigger

The entrepreneurs outside South Carolina are the federal agencies, USGS and FEMA. These entities are part of what has been called "the danger establishment." They have missions that cause them to be especially conscious of threats to society. Their job is to assess and react to risks of various kinds. In September 1981, these agencies co-sponsored a week-long conference on eastern earthquakes

in Knoxville, Tennessee. The intent of the agencies was to raise consciousness of those attending, and stimulate at least some of them to be active forces in behalf of preparedness in their own communities. Those invited, therefore, were those who were already aware and interested. The aim was to get them more active. In attendance were the two South Carolina professionals, along with over 60 other individuals drawn from the federal government and southeastern states.

The Knoxville Conference was a major effort to draw attention to the problem of eastern earthquakes. The presentations emphasized the need for marked seismic safety improvements in the east, incorporating western state advances, and the dangers posed by a quake like that of 1886. Time was spent on regional analysis and pre-planning to draft five-year action plans to develop seismic safety policy for the southeastern United States region. The most significant outcome of this September 1981 conference was the informal establishment of a body to refine and implement the five-year draft plan outlined that week.

Establishing the South Carolina Consortium

The Southeastern United States Seismic Safety Consortium was born, at least as a concept. Lindbergh and Bagwell emerged as co-chairmen of the prospective Consortium and of its more manageable--and active--subdivision, the South Carolina Seismic Safety Consortium (SCSSC). Both Bagwell and Lindbergh attest that their earthquake entrepreneurship was triggered by the 1981 conference.

An organizational meeting involving state and local officials was held at the Citadel in February 1982. Its purpose was to formalize plans for the as yet ad hoc SCSSC.³ In April, all arrangements were finalized and the body took a more organized form. The

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Charles E. Lindbergh, "Some Views on the National Earthquake Program and the Southeastern United States." March 15, 1983. p. 9.

Consortium now included approximately 70 government, industry, university, and public representatives. Ideally, the main tangible product of the Consortium's efforts would be a prototype state program for earthquake policy development in the southeast. Down the road, the southeast Consortium would coordinate the individual state efforts. But, first, the SCSSC would have to show what it could do. As formalized, in 1982, the SCSSC had three major objectives:

1. To develop and influence the implementation of a comprehensive state seismic safety policy ensuring adequate earthquake preparedness and mitigation in South Carolina, with emphasis on its low country region;
2. To provide synergism and technical qualification among engineers, geologists, seismologists, planners, governmental leaders, and the public as necessary to ensure adequate sustained implementation of seismic safety policy; and
3. To ensure federal and state seismic research and development programs adequately address the technical needs of South Carolina and the southeastern United States.⁴

To accomplish some of the specific work components implied by these goals, the SCSSC was divided into five task groups, rendering the organizational structure as follows:

Consortium co-chairmen:
Dr. Charles Lindbergh
Prof. Joyce Bagwell

Consortium Task Groups:

Hazard Awareness and Public Information Task Group
Mr. J.M. Wooten (Chairman)

Local Earthquake Resistant Design Task Group
Colonel M.R. Harlan (Chairman)

Response to a Damaging Earthquake Task Group
Mr. S.W. Kinard (Chairman)

Sector Participation Task Group
Mr. Lewis Hudgins (Chairman)

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Ibid., p. 7.

Intergovernmental and Organizational Relations Task Force
Dr. Thomas Hasen (Chairman)⁵

These task groups would tackle essential program actions in their earliest stages. These essential actions were to:

1. establish other state seismic safety consortiums/commissions
2. establish an adequate technical baseline throughout the southeast
3. promote vulnerability studies throughout the southeast
4. establish a Technology Transfer and Development Council (TTDC)
5. seismic upgrade of existing buildings
6. demonstration of technical design proficiency
7. American Society of Civil Engineers' acceptance of seismic responsibilities
8. complete development of the Southeastern United States Seismic Safety Consortium

The Consortium In Action

One of the earliest products of the SCSSC was a White Paper, "Earthquake Hazards and Risk in South Carolina and the Southeastern United States."⁶ This contained a threat analysis based on current state-of-the-art seismology. It was presented at a workshop on May 17-18, 1982, to representatives from the southeast. Held at the Citadel in Charleston, this was the first of the SCSSC's workshops on the earthquake threat. The public actions and strategies which

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Charles Lindbergh, "Earthquake Hazard Preparedness in the Southeastern United States: A Patient Revolution." Unpublished paper, May 1983. p. 6.

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"Earthquake Hazards and Risk in South Carolina and the Southeastern United States." Charleston: South Carolina Safety Consortium. December 1982.

would contribute to increased hazard awareness and public information (the workshop theme) were outlined in the White Paper. This paper proved a useful base for the workshop.

The federal government helped get SCSSC off the ground. The original outlay was \$8695 from USGS and \$5000 from FEMA in the spring of 1982. This was intended strictly as seed money. The SCSSC's intention was to build on voluntary, grass roots support at the early stages of the Consortium's development and approach the state further down the road. This approach was very much in line with Bagwell's personal preference, as well as that of Lindbergh.

A second workshop was held in November 1982 to discuss the developments in earthquake preparedness in Utah and California, with a strong eye to technology transfer possibilities. The session was held at the Baptist College at Charleston, with Dr. Richard Olson (Project Director, Seismic Safety Policy Research Center, University of Redlands, CA), Mr. Delbert B. Ward (Structural Facilities, Inc., Salt Lake City, UT--formerly Executive Director of Utah Seismic Safety Advisory Council), and Mr. Earl Schwartz (Chief, Conservation Bureau, Department of Buildings and Safety, City of Los Angeles, CA). Over 70 attended, and the session was given thorough news coverage, much to the delight of SCSSC supporters. One of the main lessons--a significant one, as far as the new institution was concerned--of the California and Utah experiences was that attempts at "steam-rolling" would invariably be aborted. It was more prudent to work at a consistent pace toward predetermined goals. Earthquakes were very much a political issue and they needed to be treated as such.

Recent Events

In May 1983, South Carolina received national attention when USGS/FEMA sponsored a major conference on southeast earthquakes there. While not an activity of the SCSSC, this conference

indirectly strengthened the prominence of the Consortium. Both Bagwell and Lindbergh played major roles at this conference, which took place at an ocean resort near Charleston.

Since the May 1983 conference, there has been slow but consistent progress by the SCSSC leaders toward winning support for a new goal of a state charter for the SCSSC. Also, in an attempt to build technology transfer and training into the earthquake effort in South Carolina, there have been discussions and a formal proposal prepared for submission to NSF, USGS, and FEMA. The proposal is a request for funds to establish a technology transfer and development council to work with both the state and the SCSSC. There would be three areas of Council activity: (1) to package existing technologies for southeast consumption, (2) to develop new technologies suitable to the southeast, and (3) to serve as a coordinating mechanism for the southeast. Four full-time technical professionals would form the council, which would involve Virginia, Georgia, Alabama, and North Carolina as well as South Carolina. An earthquake library, similar to that maintained by California, would be a main resource for the council and those it served. NSF agreed to contribute to the whole package if FEMA and USGS would do so also. As yet, there has been no definitive word on their decisions. The Council would be a direct benefit to SCSSC. However, even if the Council does not get funded, SCSSC will move forward, according to both Bagwell and Lindbergh.

At this point, the SCSSC's public policy stance remains much the same. SCSSC is a low-key organization with largely local contacts. It is not now focusing on the state legislature. It is eager to work with education groups, the preservation societies, and building inspectors, but it refrains from forcing its positions, and relies on voluntary actions. Much of its vitality depends on Bagwell and Lindbergh. Wholly aside from spearheading the SCSSC, these individuals have their own activities that could be pulled into the Consortium in time. Until 1983, with outside (federal) funds, Bagwell is doing a great deal of education activity, spreading the word, at the school level, about earthquake problems. Lindbergh,

meanwhile, is searching out technology transfer possibilities for South Carolina. He is also engaged, under FEMA funding, on a vulnerability study. Again, these are not SCSSC activities, but they are Consortium-related, and could be augmented and moved closer to the SCSSC if the Consortium could be strengthened.

It is hoped that the SCSSC eventually will be fully incorporated as a non-profit corporation, with a full-time executive director and state charter. Until that point, such money as may be awarded by sponsors will be channeled through the Citadel. This Consortium is itself the main earthquake innovation in South Carolina.

Unfortunately, the inside entrepreneurs (Bagwell and Lindbergh) remain a relatively small and lonely set of voices. They are doing well on their own; they are building alliances. But, it remains to be seen whether they can maintain a coalition over a long period of time, and how much influence for policy change that alliance can have.

As for the external entrepreneurs, the federal bureaucrats, they are not necessarily viewed with love and affection by all South Carolinians. Also, from the standpoint of most state officials, there continue to be more pressing problems on their agenda than earthquakes. It is clear they will not accord the earthquake threat a higher priority unless they are shown they should. Thus far, they have not been convinced by what they have seen or heard. The earthquake entrepreneurs, however, are working hard to make a stronger case. It may be that they will be able to move the process of earthquake policy from awareness to action in South Carolina on the basis of logic, rather than the trauma of an actual earthquake as trigger for decision-making. But that remains to be seen.

Some Recent Events

Since August 1983, FEMA has sponsored a prototype Earthquake Education Center (EEC) at the Baptist College of Charleston. It has a 12-member Advisory Board from the tri-county area which supports its

activities and conducts workshops to train teaching volunteers. The EEC is a direct result of FEMA addressing the need of earthquake safety and preparedness in South Carolina. Marilyn MacCabe has helped set up the Center in her capacity as the project officer. Although this effort is not directly connected with either the Southeastern Seismic Safety Consortium Ad Hoc Committee or the South Carolina Seismic Safety Consortium, Joyce Bagwell's strattling all three there is a link through the Baptist College.

During the 1983-84 year, the EEC has focused on the general public's awareness: schools, civic organizations, and special needs groups. Through these programs, 6900 people were personally reached and many more brochures were distributed. The five small earthquakes of that year served to stimulate local interest in the EEC's activity.

In September 1983, the South Carolina Emergency Services Office, representatives of Governor Riley's office, the EEC director, Jim Preacher (Chief of Emergency Operations for the Corps of Engineers in Charleston), and Joyce Bagwell met to discuss future plans.

On June 4-5, 1984, Bagwell and Preacher represented South Carolina at the National Earthquake Council Conference in St. Louis, Missouri. Both the South Carolina Emergency Services Office and the Governor's Office were responsive. This is essential, since state support for the EEC is crucial.

At this time (fall 1984), Bagwell is actively pursuing her teaching and public awareness efforts, EEC is functioning effectively, and South Carolina is still moving toward earthquake awareness.

PART V

AN ADVANCED POLICY SETTING: JAPAN

For 20 years, Japan has had a national goal to develop a reliable technology of earthquake prediction. Five years ago, Japan moved beyond research and development to an operational prediction program. While maintaining its scientific effort, Japan has also set up a program to use the technology of earthquake prediction as it exists at present. Japanese scientists do not believe earthquake prediction is technically "ready," in the sense of being a fully developed reliable technology. It is clearly an emergent and uncertain technology, requiring much more research. However, a national policy decision has been made that it is "ready enough" to be utilized under certain conditions. Scientists participated in this decision, but it was not a scientific decision--it was a policy (i.e., political) decision. Japan has passed a unique public policy. The Large-Scale Earthquake Countermeasures Act of 1978 (LECA) assumes that earthquakes are predictable and that predictions of damaging earthquakes will be issued. It sets forth preparedness policy for prediction and prediction response.

Without question, Japan has the most comprehensive and far-reaching national policy for earthquake prediction in the world. It is written for one quake, but is relevant to all with "large scale" destructive potential. It arose because of one credible but "general" scientific prediction, and seeks to make it better possible to have the benefits of a specific short-term prediction without its costs. LECA is truly a case of policy innovation. Like most policy innovations, there are legitimate questions as to viability and practicality, questions that will be answered fully only by the prediction and coming of the actual quake.

The earthquake in question has a name, the Tokai earthquake. It is expected to be of magnitude 8 or more, be located off the eastern coast of Japan's Shizuoka prefecture, between Tokyo and Nagoya, and be catastrophic. It would devastate this populous and industrialized prefecture and parts of five others. Without a prediction, it is expected that more than 11,000 people would die in Shizuoka alone, either because of the quake itself or from the tsunamis the quake would spawn. With a prediction, Japanese officials believe they may be able to avoid those deaths. The stakes are thus quite high, and a number of scientific as well as political reputations are on the line.

In the United States, the norm is that policy trails behind technology. In Japan, policy may be ahead or at least concurrent in development with technology. This is rare indeed. What Japan has done is worth studying and understanding for its own sake. Whether it is worth emulating remains to be seen. The decision to predict (and prepare for) the Tokai earthquake is one of the most significant national decisions involving science, technology, and public policy and/or disaster management by any government in recent years.¹

Background

The decision to go operational rested on earlier decisions to mount a major research effort in earthquake prediction. While there were scattered research activities dating back many years, the formal government program in earthquake prediction can be said to have had its origins in 1962, when a group of leading Japanese seismologists, led by Takahiro Hagiwara of Tokyo University, sought government support to create a long-term research program aimed at creating an earthquake prediction capability. This effort was subsequently endorsed by various national scientific advisory bodies. In 1965, a

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Book Review by Carl Kisslinger, "Earthquake Prediction Techniques: Their Application in Japan," in Earthquake Information Bulletin 15, 3 (May-June 1983), p. 117.

distinctive, visible earthquake prediction program was formally set in motion. The orientation was basic research, and it was organized initially as a 10-year program. Funds came through several agencies with interests in the earth sciences. To the extent there was policy guidance, it was through the scientists themselves. They did this by way of the Geodesy Council, a prominent and influential advisory body composed of leading government and university earth scientists based in the Ministry of Education.

Almost from the beginning, scientists involved in the program felt pressure to direct it toward more applied objectives. In May 1966, a magnitude 7.9 earthquake hit northern Japan. The Geodesy Council revised its original plan and substituted in its place two five-year plans, the second of which gave greater emphasis to predictive capability, in contrast to the gaining of basic understanding of earthquake processes.²

In 1969, the Geodesy Council established a subcommittee, the Coordinating Committee for Earthquake Prediction (CCEP). This body, headed by Hagiwara, would meet every three months and review data coming from the overall earthquake prediction research effort. On the basis of the data, it would designate certain regions as worthy of enhanced instrumentation and research by university and government scientists. In this way, particular areas were "targeted" for applied research, possibly leading to a long term, very general, prediction. In 1970, one area, the South Kanto region, which includes Tokyo and Yokahama, was given a high priority of concern, "intensified observation." This was the region that had been devastated by a 1923 earthquake that took over 100,000 lives. It is the population, economic, and political center of the Tokai region. A few others were given a lower priority designation, "specific observations."

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Geographical Survey Institute, "Activities of the Coordinating Committee for Earthquake Prediction," (1982), p. 13.

Awareness of the Tokai Problem

That the Tokai region was on the agenda of CCEP was due primarily to Kiyoo Mogi of Tokyo University. His research on plate tectonics led him to argue in 1969 that the Tokai region might be the site for a future great earthquake.³ "Reported sensationally by some newspapers and weekly journals," Mogi's concern was taken seriously by CCEP, as indicated by its 1970 action. However, it was neither the scientists' nor the nation's priority earthquake concern at this point. Priority had been given to South Kanto. In 1973, however, Tsuneji Rikitake, of Tokyo University, testified in the Diet that the most likely places in Japan where interplate great earthquakes would soon occur were off eastern Hokkaido and the Tokai district. Eastern Hokkaido, like Tokai, had been placed in the lower category of "special observation." Not long after Rikitake spoke, a 7.4 magnitude quake shook eastern Hokkaido. In 1974, CCEP upgraded Tokai to an area of "intensified observation."⁴

Now, more and more scientific governmental attention was given to Tokai. It was known that the Tokai region had suffered repeated great quakes throughout Japanese history. Most recently, there had been one in 1944. Before that, records showed huge quakes in 1854, 1707 (when Mt. Fugi, in Tokai, erupted), 1498, and earlier. But very little specific information was known about the Tokai quakes earlier than 1944, aside from their awesome scale. With the active interest in Tokai, researchers turned up new archival materials that provided far better data on the 1854 quake. This event was of 8.4

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Kiyoo Mogi, "Recent Horizontal Deformation of the Earth's Crust and Tectonic Activity in Japan (1)," Bulletin of the Earthquake Research Institute 48 (1970), pp. 413-430; "Seismicity in Western Japan and Long Term Earthquake Forecasting," Earthquake Prediction--An International Review, Maurice Ewing Series 4, American Geophysical Union (1981).

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Katsuhiko Ishibashi, "Specification of a Soon-to-Occur Seismic Faulting in the Tokai District, Central Japan, Based Upon Seismotectonics," Earthquake Prediction--An International Review, Maurice Ewing Series 4 (1981), p. 299.

magnitude and occurred off-shore. The point of rupture extended into Suruga Bay, a body of water that cuts into the heart of Shizuoka prefecture. The 1854 quake was a terrible one. It gave rise to tsunamis that destroyed whole villages and towns. One of the researchers making use of these archival data was Katsuhiko Ishibashi, an assistant to Toshi Asada, Tokyo University professor and a senior member of CCEP. What Ishibashi did also was to recognize that the 1944 Tokai quake had not extended as far as Suruga Bay. Examining the pattern of recent seismic events in the area, he hypothesized that the fault underlying Suruga Bay constituted a "seismic gap." He believed that the rupture that had begun in 1944 would soon complete itself, and a great earthquake in the Suruga Bay would fill the gap.

In May 1976, Ishibashi made known his findings and interpretations to CCEP. He implied that the matter was too serious to remain a purely scientific issue, and that the public should be alerted. Specifically, he asked that the quake be called "Suruga Bay," rather than Tokai, to bring home to everyone the threat that was impending. CCEP told Ishibashi to come back to its next meeting, in August, with more scientific detail to back up his statements. In August, Ishibashi returned, with data on his fault model, and an admonition that the quake could be "imminent because the seismic gap had lasted for 122 years and the accumulated strain around Suruga Bay was inferred to be close to an ultimate value." As far as Ishibashi was concerned, the "main round" in the Japanese earthquake prediction program had begun. He made it known that he would report his findings at the next meeting of the Japan Seismological Society.⁵

Japanese senior scientists on CCEP, including Asada, did not try to stop Ishibashi. Ishibashi had sounded the alarm, and word leaked to the media fairly soon. Reports in the press were scattered, however, owing to the fact that Ishibashi, while a scientist, was young (31) and unknown. Was Ishibashi making a prediction? It was

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Ishibashi, p. 301.

not clear. Various government officials (as well as media) had heard predictions before. How credible was this one? In late August and in September, there were informal and unofficial conversations among government officials, media, and senior seismologists. The gist of the situation at this time was that there were two scientific views on the subject. One was that Ishibashi's seismic gap thesis was correct. The other was that the Suruga Bay segment would rupture only when the larger portion of the fault, which broke in 1944, went again. This latter circumstance would place the next Tokai quake somewhat further in the future. Either way, the Tokai region had a problem, but if Ishibashi were right, the problem could be immediate.

By October, awareness of Ishibashi's thesis was growing. When Ishibashi delivered his paper on the "Suruga Bay Earthquake" at the Japan Seismological Society, he had quite an audience. The media were there in force. He now said publicly what had mostly been said, up to this time, in private. As before, he went well beyond science, to public policy. He "emphasized that the expected earthquake would bring unprecedented catastrophe in the worst case and the existing system of earthquake prediction was quite insufficient to reduce its extraordinary damage, and proposed that a powerful and comprehensive organization unifying short-term/immediate prediction and disaster prevention for this specific earthquake should be created as speedily as possible."⁶ He made it clear in his paper and in subsequent interviews that a great "Suruga Bay earthquake" could be imminent, and that the precursors to such an event could begin at any time--literally, tomorrow.

This was as close to a prediction as one could come without citing a particular date. It was a general prediction, but not long term like most general predictions. In fact, it was rather specific. And what he was saying had increased credibility. The reason was Asada. This highly respected and quite influential scientist was

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Ibid.

called before a Diet committee in October that was dealing with the subject of earthquake prediction, in the context of a consideration of the new Japanese budget. In response to questioning, Asada declared that it had been stated that it would not be surprising if an earthquake occurred tomorrow. In a certain sense, he said, this is true.⁷ Asada went on to point out the other school of thought. But the impression he left was that a great earthquake in the Suruga Bay could well be imminent. Furthermore, he indicated it might be possible to predict this great earthquake. What was said by Asada was cautious and guarded. What was said by the legislator questioning him was not. This individual leveled sharp criticism at the prime minister and his ministers for not making a concerted effort to predict the Tokai earthquake.

The Scientific Response

In the remaining months of 1976, the credibility of the Ishibashi "prediction" became even stronger. In November, CCEP publicly endorsed Ishibashi's view that the likely point of rupture of the Tokai earthquake (that was the name that was "officially" used for the quake) would impact directly on Suruga Bay. However, it stated that there had not yet been precursors that would allow them to specify exactly when the great quake would occur.⁸

What was most important was that the Ishibashi prediction was not denied by the body with a de facto responsibility for legitimating an earthquake prediction. The absence of a CCEP negation (coupled with at least partial support by that body) added to the credibility of the Tokai earthquake. There were few scientists in or out of CCEP who were taking issue with the argument that there was a seismic gap that could soon be filled by the great Tokai quake. The

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Budget Hearings, Japanese Diet, Upper House, October 4, 1976.

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Ishibashi, p. 301.

other point of view seemed to be weakening over time. By default, therefore, the Ishibashi thesis (prediction) became increasingly accepted as the scientific "consensus."

There was another factor at work. This was awareness on the part of scientists, politicians, media, and others of the Chinese success in predicting the Haicheng earthquake in 1975. This success grated. If the Chinese could predict, why could not the Japanese, a nation far more advanced in the science and technology of earthquakes. Scientific ambition and national pride were part of the environment in which policymaking was now proceeding.

In December, the Geodesy Council took a key step. It called for changes in the third five-year earthquake prediction plan, then under way. It proposed an intensification of various observations and surveys in the Tokai district for long-term prediction, and the establishment of a continuous watch system to catch the precursors if and when they came. In addition, it recommended a special committee of leading seismologists to evaluate *anomalous phenomena* for short-term prediction.⁹ The Geodesy Council thereby proposed that an operational earthquake prediction program be established--for this one particular earthquake. That this happened pointed up the fact that the Ishibashi view had now become the consensus of Japan's leading seismologists, and a basis of a major change in Japan's earthquake policy.

The Governmental Response

Ishibashi had proposed a major new agency to mobilize resources to predict and prepare for the Tokai earthquake. This view did not go over well with existing agencies having interests in the field. What the Japanese Cabinet did do (in October) was raise the status of an existing administrative coordinating committee for earthquake

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Ishibashi, p. 301.

prediction, and called it "Headquarters for the Promotion of Earthquake Prediction." The Science and Technology Agency, an organization with a broad R&D mandate and coordinating role, was placed in the chair of this body. It was to the "Headquarters" that the Geodesy Council recommendation went in December.

In line with discussions and agreements at the Headquarters level, governmental responsibility for prediction was clarified and centralized for the first time in early 1977. The agency, given the principle role in this regard, was the Japan Meteorological Agency (JMA), an organization experienced in issuing warnings in the case of weather and tsunami disasters. JMA had a major unit concerned with seismology, and the head of this unit, Shigeji Suyehiro, was in line to become Director General of the JMA. JMA had the Geodesy Council's support. It was agreed that all agencies and universities conducting research in Tokai should telemeter their data to JMA. Staffed on a 24-hour basis, JMA would receive and interpret such data.

In accord with the December Geodesy Council recommendation, an Earthquake Assessment Committee (Hanteikai) was created, in April 1977, under CCEP. Its task was to advise JMA on earthquake prediction. It would meet monthly and on an emergency basis. Composed of a half dozen eminent seismologists who lived in the Tokyo area, this body was chaired by Hagiwara. Among members were Asada, Rikitake, and Mogi, scientists whose names were already linked with the Tokai earthquake. They carried beepers so they could always be on call. These scientists bore a heavy responsibility, and they were seldom very far from the sight of a watchful Japanese media.

The media remained intensely interested in the Tokai earthquake. Beginning in January 1977, the Japan Broadcasting Corporation (NHK), a quasi public corporation similar to the British Broadcasting Corporation, had initiated a series of programs on the Tokai earthquake. These served to keep the issue of what to do about the quake, and a prediction of one, before the nation. There were many who felt the government, in launching an operational prediction

system, was not going far enough in considering the policy requirements and implications of such a system. Nor, in the view of some, was the national government doing enough to help the Tokai region prepare for prediction, as well as the quake itself.

Advocating a National Policy

The man who was most critical was Governor Keisaburo Yamamoto of Shizuoka. There were many politicians who were talking about the Tokai earthquake, but none felt the actual responsibility more keenly. A middle-aged man in his second term as governor, Yamamoto told the citizens of Shizuoka that he would do all in his power to protect their lives and property. In October 1976, he appointed a small fact-finding group from within his government (the Hanteikai), and it advised him of the seriousness of a Tokai earthquake. Thousands would die and many, many more thousands would be seriously injured.

In May 1977, he enlarged this body to 18 members, including a range of specialties, from seismology to education. A new Earthquake Countermeasures Division--this organization was strongly backed by the governor. Its mission was to take leadership, on behalf of the prefecture government, in planning and action for the Tokai earthquake. The working assumption of the division was that the great earthquake would come within 10 years.¹⁰

Yamamoto put great store on earthquake prediction--he regarded it as Shizuoka's best hope for averting catastrophe. He was most impressed that China's political leaders had decided to predict, and had created, virtually overnight, an operational system for forecasting earthquakes. Why could not Japan's political leaders show the same vision? He and Shizuoka would do their part in responding

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Shizuoka Prefectural Government, Earthquake Preparedness Division, "An Outline of the Earthquake Response by the Shizuoka Prefectural Government in Japan," (January 25, 1983), p. 1.

to a prediction. But the total system of predicting, warning, responding, and preparing required comprehensive national policy. What had been done thus far was ad hoc and incomplete. He began pushing for a national policy.

In July, the All-Japan Gubernatorial Conference, a nationwide conference of governors from Japan's 47 prefectures, met. At Yamamoto's urging, a Special Committee on Earthquake Disaster Prevention Measures was established. The charge given the Committee was the development of recommendations to the Diet regarding policies for the Tokai earthquake. Yamamoto was made its chairman.

In September, Yamamoto met with Prime Minister Takeo Fukuda, and raised the Tokai matter with him directly. He asked the prime minister to consider seriously the legislation the Governor's Committee was developing. The prime minister replied that he would do so, and attempt to respond positively so as to calm the minds of the people of the Tokai region.

Later, Yamamoto brought senior Japanese seismologists to meet with him and the prime minister. Yamamoto felt that the risks of prediction, including a false prediction, had to be taken from the shoulders of the scientists and placed on those of the politicians, particularly the chief politician, the prime minister. Only if the prime minister accepted his responsibility would others fully accept theirs.

There was resistance to Yamamoto within the Japanese bureaucracy. The two principal points of resistance were the National Land Agency (NLA) and Finance Ministry. NLA is the functional equivalent of the U.S. Federal Emergency Management Agency (FEMA). It has the national disaster mission. Its emphasis has traditionally been one of response, although it also does a good deal of preparedness planning. However, earthquake prediction was not on NLA's agenda at this time. It was skeptical of the need for a national policy for the Tokai earthquake. Existing legislation and NLA procedures could handle the Tokai problem, if there really was a problem. It was not

convinced earthquake prediction was "ready" and thus in need of a special policy regime. Yamamoto's view, of course, was that it was "ready enough," given the need.

Equally unenthusiastic was the Finance Ministry. Its role as guardian of the purse in Japan is similar to that of the Office of Management and Budget in the United States. It is institutionally skeptical of new spending programs, especially programs that benefit one particular region of the country, at the expense of the rest. It knew that preparedness meant more than paper-plans. It meant reenforcing buildings, widening roads for evacuation, constructing tsunami walls, and taking a variety of other actions. Tokai governments would want money, and, if Tokai were helped, where would the demand end for subsidies in earthquake-prone Japan?

Such bureaucratic resistance was very significant. In Japan, the bureaucracy has high prestige for its professionalism, and is the focal point for the origin of most legislation. The agencies are powerful in their own right. Moreover, Japan prefers to take policy initiatives only after a consensus has been established. That consensus was not present in 1977.

In November 1977, Harada Shozo, a Shizuoka representative in the Diet and ally of Yamamoto, moved to prod the government. He had spoken with various seismologists and had concluded that there was a 70-80 percent chance they would predict the Tokai earthquake. He noted an NHK public opinion poll that said most Japanese wanted prediction attempted, even though it might fail. As far as he was concerned, it was time for action. He therefore introduced the LECA, a bill incorporating ideas from various sources, including the Shizuoka Earthquake Preparedness Division and Governors' Committee.

This proposal called for a national conference to create a unified earthquake prediction system. Under the legislation, there would be designated areas of intensified observation for large-scale earthquakes, earthquake monitoring, and data aggregation. The legislation would provide a legal basis for the earthquake prediction

committee (Hanteikai), and provide for a report to the prime minister when the discovery of irregular conditions suggested an earthquake might be imminent. The legislation called for issuance of an earthquake warning by the prime minister, the creation of large-scale earthquake disaster plans throughout the Tokai district, and obligatory implementation of previously determined earthquake disaster countermeasures by public agencies and managers of dangerous materials when the prime minister's warning was issued. It authorized a national subsidy system to help meet the expenses required for large-scale earthquake countermeasures.

One month later, in December, the Governors' Committee issued its recommended act. Essentially the same as that of Shozo, this proposed bill added some important new elements. For example, it denied governmental obligation to compensate private sector losses in mobilizing for earthquake prediction. It also called for planning and funding to be carried out over a five-year period.

A Final Catalyst

On January 14, 1978, a magnitude 7 earthquake shook the Izu-Oshima area of Shizuoka. Twenty-five people were killed, 205 injured, 712 structures destroyed, and over 4000 damaged. This was not the Tokai earthquake--but it was perceived by most officials and media as a possible harbinger of "the big one." On January 17, Prime Minister Takeo Fukuda said to the head of NLA that special legislation had to be considered. The NLA director replied that he would have a proposal in a week.

On January 18, Yamamoto was advised by JMA of the possibility of continuing aftershocks from the earthquake. He informed local governments and the general public of this fact. Instead of helping matters, the warning may have hurt the situation by creating additional anxiety and confusion. Some people thought the "forecast of aftershocks" signified that the Great Tokai earthquake was about to occur. There were "spontaneous evacuations and a rush to buy emergency provisions." Informal as well as formal channels of

communication contributed to misinformation. Various government jurisdictions themselves moved in conflicting directions. "As agencies began contacting each other, greater emphasis was placed upon the expected magnitude of the aftershocks and their imminence. Some municipalities transmitted the warning message to their residents. Others did not. In each case, the content of the warning message varied. In at least one instance, a major industrial firm suspended operations on the basis of the warning with temporary but severe economic losses. . . ."11

This sequence of events reenforced the now general view that a credible prediction would create truly novel problems, and these had to be addressed ahead of time, as part of a comprehensive policy for the Tokai earthquake.

Adopting a National Policy

NLA had the lead in proposing legislation. Virtually everyone with an interest (scientific, administrative, political) was consulted over ensuing months. Draft after draft was written. Yamamoto, Shozo, and the Governor's Committee insisted that the prime minister himself issue the warning once a prediction was made. The prime minister's involvement would underline the national government's responsibility and provide both a symbol and reality of priority. National government officials, particularly the Finance Ministry, insisted on separating the authorization of a policy from its funding. As finally resolved, policymaking was segmented into three stages: (1) legislation authorizing broad national policy, (2) administrative designation by the prime minister of specific action in a particular area, and (3) legislation for funding. Yamamoto, Shozo, and their allies accepted this sequential approach as a quid

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Southern California Earthquake Preparedness Project (SCEPP), Japanese Earthquake Prediction/Preparedness Program (Van Nuys, California, SCEPP, 1982), p. 37, hereinafter referred to as SCEPP Report.

pro quo for the national government's support. Also, they knew that they were more likely to get passage of a bill in the Diet if the prime minister and his cabinet were its source.

On April 6, 1978, the government introduced to the Diet the LECA. The only serious opposition came from the socialists and communists, who voted against LECA "on principle," because it authorized mobilization of the Japanese military following a prediction-based warning. The government's controlling Liberal Democratic Party had the necessary votes, however. LECA passed June 7, and was promulgated into law June 15, 1978.

LECA established a national policy framework for earthquake prediction, response, and preparedness in Japan. It authorized the prime minister to designate certain regions of Japan as "areas for intensive measures." "Areas for intensive measures" would come under a special policy regime.

A designated area would be focus of "incessant" seismological observations and surveys. The national government would be responsible for formulating a disaster prevention plan and assuring its implementation in the area. Prefectural and municipal governments, as well as major private enterprises, would be required to develop plans in conformance with national guidelines.

It was made official that prediction would come from the JMA. It would go to the prime minister who would issue the warning to the public. It was left to JMA whether it would rely on the Hanteikai or would replace this mechanism with a different apparatus. Once a prediction-based warning was issued, previously developed prediction response plans would go into effect. The prime minister would automatically become director general of a National Headquarters for Earthquake Disaster Response, and coordinate all governmental actions, including the use of military personnel. Governors and mayors would take command of emergency headquarters at their respective levels, and work closely with the prime minister in making optimal use of the lead time prior to the quake.

The issue of compensation for a false alarm was not raised explicitly. LECA did authorize (not obligate) those responsible for implementing the law to compensate private parties for measures economically damaging during the prediction period. However, little was said about financial details. Further, it was stated that there would be costs associated with preparedness, and possible subsidies by the national government were mentioned. While these subsidies obviously could apply to longer term preparedness measures for the event itself, the general tenor of LECA was prediction-oriented. The issues of money were left deliberately vague, to be worked out later.

Finally, the prime minister was authorized, upon advice of the JMA, to cancel the earthquake warning, and thus end the emergency period.

Two months later, on August 7, 1978, the second step in the Tokai earthquake decision process was taken. The prime minister designated Tokai as the first (and, thus far, only) "area for intensive measures." Included in this area were all of Shizuoka and parts of five other prefectures. The decision on geographical boundaries was made on the basis of scientific estimates of impact--those places suffering a magnitude 6 and above shock, as measured by the Japanese intensity scale.¹²

LECA gave responsibility for developing the national plan for dealing with an area designated for intensive measures to the Central Disaster Prevention Council. This was an 18-agency body, located in the prime minister's office, chaired by NLA. It was NLA, relying on JMA for seismological advice, that took the lead in forming a national plan. Completed in 1979, this plan focused on the period from warning to event. It provided a set of requirements

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In this scale, a magnitude 6 is "disastrous," and causes destruction of 1-30 percent of Japanese wood houses; causing large landslides, fissures in flat ground and some in low fields, accompanied by mud and water spouts. SCEPP Report, p. 10.

to be taken into account by various prefectural and local governments, as well as certain types of private organizations, in connection with Tokai. It provided legitimacy and an obligation for them to do more in planning, and, for governments, enhanced their powers of enforcement vis-a-vis the private sector.

Thus, the plan required that there be "a clearly defined system for publicizing earthquake warning statements during working and non-working hours." It called for prefectural and municipal governments to develop plans for evacuation, emergency water supplies, and backup electrical systems. It called upon them to plan for the regulation of public broadcasting systems, the financing of emergency services personnel during the warning period, the control of traffic, and development of mutual aid agreements. The national plan directed prefectural and municipal governments to make certain that regular tests, exercises, and public information campaigns would be held relevant to earthquake prediction response.¹³ While concerned with planning for short-term measures following the prediction and warning, the plan noted that these would have to build on longer term measures, such as making structures and facilities more earthquake resistant.¹⁴

It was now up to the prefectures and local governments of Tokai to respond and conform to this national plan. It forced them to work along similar paths so that a regional response might be feasible. Meanwhile, Shizuoka and the other affected governments worked to consummate the understanding that accompanied and facilitated the passage of LECA--namely, national subsidies. In spite of this informal agreement, the Finance Ministry continued to be reluctant. The Finance Minister, who came from a small prefecture lacking many

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SCEPP report, pp. 14-15.

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National Land Agency, Basic Plan of Earthquake Disaster Prevention for Areas Under Intensified Measures Against Earthquake Disasters for "Tokai Earthquake," (Tokyo, Japan: National Land Agency, 1980), p. 1.

of the resources and economic strengths of Shizuoka, felt that the Tokai prefectures (especially Shizuoka) could bear the burden themselves. At one point, he told Yamamoto that if he could bring to his prefecture the kind of money Yamamoto was going to bring to Shizuoka, he would never have to worry, as a politician, again. Eventually, after much haggling, in late 1980, the third and final step in the LECA adoption process was consummated: a Special Financial Measures Act was passed and signed into law.

The legislation provided the means to finance prediction/preparedness activities over a five-year period, from 1980 through the end of 1984. It "added new categories of projects (hospitals, social welfare facilities, elementary and junior high schools, tsunami and landslide countermeasures) to the original ones identified [in 1978] for countermeasures (evacuation sites, evacuation routes, fire prevention installation, communication facilities, emergency transport routes, and green belt zones around petroleum complexes). It increased subsidies to local governments for upgrading the seismic resistance of schools. It also added a surtax of approximately 10 percent to corporate taxes to finance earthquake preparedness programs in each of the seven prefectures included in the area of intensified measures."¹⁵

National funds would subsidize one-half to two-thirds of the costs of preparedness over a five-year period. To get funds, prefectures and local governments would have to develop proposals and submit them for approval to NLA, which was responsible for coordinating and overseeing implementation of LECA. In addition to authorizing funds for prefectural and local governments, the law also provided \$50 million a year in national subsidies for a reinsurance program that would assist insurance companies to recover from the impact of the expected event. The total cost of implementing LECA would be expensive--approximately \$1.7 billion over the five-year period for just the federal subsidies. Prefectures and local governments would

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SCEPP Report, Executive Summary, p. 15.

also be making contributions. For Shizuoka, this would mean approximately \$125 million. In addition to these funds, authorized by the 1980 law, there were the monies for the scientific prediction effort. These were running at \$30 million per year and were directly or indirectly relevant to Tokai.

It could be said that LECA and the follow-on actions had established a large-scale program in earthquake prediction/preparedness. This comprehensive effort would run five years and cost in excess of \$2 billion. In many ways, it was a national "demonstration" that Japan could meet--and fight--the challenge of a great earthquake.

Implementing LECA

LECA and the subsequent measures had innumerable impacts over ensuing years. Thus, with respect to prediction/warning, one effect of LECA was to give a legislative base, and thus strengthen the role of JMA in this field. Upon passage of LECA, the Hanteikai was moved from being a committee of the CCEP, under the Geographical Survey Institute, to being an advisory arm of JMA. LECA also made it easier for JMA to ask, and harder for the Finance Ministry to refuse, JMA funding increases for work related to Tokai. It better legitimated JMA's asking for, and receiving, data on Tokai from other agencies and university research organizations. JMA was enabled to move quickly to place four permanent ocean bottom seismometers in the area of the expected rupture. These activities improved the overall capacity of JMA to manage an operational prediction system. The Hanteikai, meanwhile, further developed criteria for situations under which an emergency meeting would be called and a prediction issued.

The impacts of LECA on what happened after prediction--e.g., the warning system--was complex, since what was involved, in one respect, was a relationship between government and media. Indeed, the media relationship proved to be most troublesome from the standpoint of JMA and other agencies concerned with the warning. The disagreement was basic. The government wanted to maintain control

over information so as to better manage the warning and response period. It was worried about panic and confusion. The media, for its part, wanted no limits on its right to know and to let the public know immediately. The government felt that unless there were limits the warning would emanate from the media before the government could mobilize police and other security personnel.

The government asked for a 130-minute news blackout from the moment the Hanteikai convened in emergency session. This would allow time for data to be carefully evaluated and appropriate national and prefectural officials notified if the decision was that a prediction/warning was justified. There were many lengthy discussions before a compromise was struck. The agreement was that there would be a 30-minute news blackout, beginning when the Hanteikai gathered in emergency session. NHK would be the only media organization receiving official word that the Hanteikai was being summoned into special session. Through various media associations, this understanding was formalized and ultimately accepted.

Finally, the whole area of preparedness countermeasures required implementation. Here, various governments--national, prefectural, and local, and government-business sectors--had to work out relationships. However, potential intergovernmental problems were smoothed enormously by the process of consensus building that ensued before its passage. LECA and subsequent measures were designed, in part, by those most sensitive to the implementation problems, notably Shizuoka officials. The affected parties in this case were full participants in designing the policy under which they would work. For example, it was politically much easier for the national government to impose a 10 percent "countermeasures" tax on industry within Tokai than it would have been for the prefectural governments themselves to do this.

Even before LECA, however, affected governments were taking action. These actions varied with the perceived threat. Shizuoka, which was at extreme risk, was most active. It funded, on its own, a number of countermeasures. These meant cutbacks in other areas, and

resulting cries of anguish from those who felt their interests to be injured. Shizuoka's Governor Yamamoto stated that the Tokai earthquake had to take priority, and the Shizuoka-based media as well as the prefectural Diet supported him. When the Financial Measures Act was passed in 1980, Shizuoka's implementation problems were eased somewhat, as more than \$1 billion in national subsidies began moving in this one prefecture's direction. The preparedness measures included: widening roads for evacuation routes, preparing earthquake prediction and other materials for the citizens, including school children, putting schools through earthquake drills, strengthening buildings and bridges, working with local media and disaster officials on response to warning, improving fire-fighting facilities, securing hospitals, schools, social welfare facilities, coasts, rivers, and harbors against tsunami, and measures against landslides.¹⁶

Funds were allotted on a year to year basis. The affected governments in Tokai sometimes felt NLA did not share their sense of urgency. NLA, for its part, had its own problems in getting the money to meet Tokai needs. The funds were spent not through one agency but a number of agencies. The coordination problems were considerable.

Among the various implementing agencies, none worked more diligently than the Shizuoka Earthquake Countermeasures Division. It had to work hard. It was convinced that time was running out. It projected that 11,000 people would die in Shizuoka alone from the Tokai earthquake. It still counted prediction the best hope for saving lives and preventing serious injuries, but it worked on other kinds of preparedness measures that would mitigate the disaster even without prediction.

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Earthquake Preparedness Division, Shizuoka Prefectural Government, "An Outline of the Earthquake Response by the Shizuoka Prefectural Governments in Japan." (January 25, 1983)

Within the affected areas, there was general acceptance of the governments' programs. Companies did not enjoy being taxed, and people's homes had to be razed to make new or wider transportation routes for evacuation at the time of prediction. Eventually, other legislation was passed providing positive tax incentives to those companies and individuals who took special earthquake preparedness measures.

The effort to inform citizens about the coming quake and involve them in preparedness planning was continuous. There were certain local citizen groups, called Jishubo, who were particularly involved with an aim to improving citizen self-help capacity. These groups were supplied with portable pumps, water purifiers, emergency generators, floodlights, fire extinguishers, cooking pots, wireless communication apparatus, storage tanks, and other equipment. It is hoped that such citizen groups would help in communicating information clearly after a warning is issued, as well as helping the general public to respond appropriately.¹⁷

Continuing Issues

There are a number of continuing issues affecting the Tokai program. Perhaps the most significant are: 1) maintaining momentum, 2) discontent with the 30-minute blackout, 3) concern about the intermediate or "messy" prediction, and 4) scope of the LECA earthquake program beyond Tokai.

First, is the problem of momentum for prediction/preparedness in the Tokai area. The Tokai program has been implemented at a somewhat slower pace than originally intended. This is in part because certain construction work has moved slowly, due to the fact that people had to be displaced. As the program has lagged somewhat, so

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SCEPP Report, p. 42.

also has reimbursement. The consequence is that the Tokai program may stretch an extra year and conclude at the end of 1985, instead of 1984.

The earthquake problem has not gone away, but there is a danger now that public interest will slacken. What was predicted "tomorrow" has not happened, and officials fear that the public may be lulled into a false sense of security. Scientists associated with the program, as well as CCEP, in an official capacity, caution that there is still the strong likelihood of a great quake in the "not too distant" future. But, there is a question, being asked in Tokai today, about how long a populace can keep up a high state of preparedness. To help counteract the inevitable tendency to deny the reality of the threat, Tokai officials make the most of "Disaster Prevention Day" exercises every September. This day is observed nationwide, but it has special meaning for Tokai. During this day, there are drills not only for an earthquake event, but also for earthquake prediction. Many of the officials who would be involved in prediction/warning/response go through the steps that would be followed in an actual situation. In addition to "scheduled" reminders, there have been, in at least one Shizuoka locality, Yaizu City, unannounced earthquake exercises.¹⁸

Still, there is concern about keeping up momentum, especially after the period of preparedness planning is over. The longer there is no quake in Tokai, the more likely is its arrival. Yet, ironically, the longer there is no quake, the more the public may conclude that Ishibashi and the scientific community were "crying wolf."

A second issue is discontent with the 30-minute blackout. The media, in particular, never liked the notion of a blackout and would prefer to forget this agreement. No one is actively promoting such a change, however. But dissatisfaction is widespread. The various

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SCEPP Report, pp. 41-42.

media organizations are exceedingly competitive, and there is the possibility the blackout will not hold, even under the best of prediction situations. It is noteworthy that Shizuoka is also not that pleased with the 30-minute blackout. It was negotiated without this prefecture's concurrence, and it believes 30 minutes is an arbitrary time. Officials are cognizant that they will face the brunt of responsibility for dealing with public reaction--or panic--when word is released (or leaked) of an emergency Hanteikai meeting.

The third issue is the nature of the prediction. Specific precursory criteria have been devised by the Hanteikai for calling an emergency meeting and issuing a prediction. All planning is based on the belief that precursory information will be clear enough for a short-term prediction (hours, maybe days). But what if the precursory information is uncertain and/or there is division of opinion among Hanteikai members? What if there are those on the committee who feel that an intermediate prediction may be possible, indicating the likelihood of a quake in weeks, or months. Or, what if there are strong precursors that seem to come and go over time?

There are many contingencies, and as many worries. There are those in the media who expect that there will come a time when the Hanteikai will start spending a great deal of time at JMA headquarters, virtually living there, and senior JMA and NLA officials will show evidence of being on a state of alert. One scenario is as follows: there will be no announced prediction, but media people will know that something "unusual" is going on. This fact will be reported, and a de facto intermediate prediction will be in effect, unless specifically denied. There are other scenarios, all based around assumptions other than the neat, clear-cut, and short-term precursory phenomena that meets the criteria set by the Hanteikai. There are responsible individuals, including a senior scientist, involved in the program, who believe a messy or intermediate term prediction is a distinct possibility.

Shizuoka, at least, has done contingency planning for such an event. It is not regarded as a pleasant possibility by anyone connected with the program. Studies indicate that the greatest problems-- economic, psychological, governmental--come from the intermediate prediction.¹⁹ A short-term prediction provides enough time to take major societal precautions and evacuate affected areas. Long-term prediction (years) gives time for a range of preparedness measures, as seen in the Tokai case. The real worry is something in-between: a prediction for an event several months or a year away. Shizuoka has been building a reserve fund to cover various contingencies in its prediction/preparedness program not otherwise provided for. These could, presumably, include the contingency of economic problems derived from a false alarm, or "protracted" state of quasi-prediction. Again, such an intermediate prediction may not be officially issued. It does not have to be, to be a public reality. All that is necessary is for the media to convey the unusual activities of scientists and disaster officials, along with leaks of information (and misinformation) sure to come.

A fourth issue is the expansion of the "LECA system." From the time LECA was passed there have been pressures to expand the areas for intensive measures beyond Tokai. There are good arguments to be made for doing so. The area affected by the Tokai earthquake extends beyond that designated. That which was included was done so because it would be the worst affected by the shaking of the quake. Neighboring areas will also be impacted, especially populous Yokohama, which may have a liquefaction problem.

Indeed, Yokohama and Tokyo are as concerned about the impact of prediction as they are about the Tokai quake itself. This is because of the fear that news of the prediction/warning will cause panic and a crush of people trying to get home to their families. Under the best of circumstances, Tokyo and Yokohama subway and train

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"Earthquake Prediction Is Coming," and "Earthquake Prediction: Is It Better Not to Know?" in Mosaic 8, No. 2 (March/April 1977), pp. 2-14.

stations present a congestion problem. Under the worst circumstances (such as the emergency period following a prediction/warning) the situation in the central rail depots may get out of control. It has been decided at the national level that trains will not go to the Tokai area once a warning has been issued. Other trains in neighboring areas will be slowed or stopped, depending upon the circumstances. However, fears of congestion (and panic) at the train stations persist, especially in Yokohama, which is closer to Tokai than Tokyo.

Using its own funds, Yokohama has built a huge facility at its train station for temporarily "housing" the thousands of people who may be stranded if/when the trains are stopped. In addition, both Yokohama and Tokyo have been talking with major employers about ways to "stagger" the times workers would be permitted to go home at the time of a prediction-derived emergency. This is a slow process, since all discussions are based on contingencies that rest on an uncertain technology of a prediction that may not happen.

Since they are not in the area of intensified measures, Yokohama and Tokyo do not have the benefit of national subsidies, special taxes, or regulatory authority. This frustrates officials in these cities who have to plan for earthquake disaster. It grates especially because they are the heart of the South Kanto area that scientists designated an area of intensified observations in 1970, four years before so placing Tokai. The threat of an earthquake may not be as imminent as in Tokai. But, if an earthquake of substantial magnitude were to hit South Kanto (Yokohama-Tokyo), the repercussions would be even more horrendous. This is the core of Japan's population, economy, and government. The whole country would probably come to a standstill. There is some evidence that a magnitude 7 earthquake directly under Tokyo is a possibility in the relatively near-term.

Hence, the issue of expanding the LECA system beyond Tokai is real, and the pressures to do so are growing. Resistance by the national government is based on the reality that the costs of preparing South

Kanto for prediction, much less a great quake itself, would be huge. The national government is justifiably wary of assuming a new obligation before it has completed that for Tokai. Moreover, it asks: Where will expansion of the LECA system stop in earthquake-prone Japan?

The most serious recent earthquake was in neither Tokai nor South Kanto. It was in northern Japan, the Akita earthquake of May 26, 1983. This quake took 102 lives, including those of many children caught in the tsunami that resulted from the event. Now, the governor of the prefecture in which Akita is located has joined Yamamoto in becoming an earthquake prediction/preparedness advocate. Indeed, the Governor's Committee that helped get LECA passed in 1978, and which was largely dormant afterward, has been revived in 1983. Yamamoto continues in a leadership role and now calls for a nationwide earthquake prediction/preparedness system.

Even many who support a stronger national effort in this field are concerned that Yamamoto may be asking for too much too soon, especially in the case of earthquake prediction. They caution that the Tokai quake is special in that scientists believe it to be predictable. Other quakes may not have the precursors a great earthquake off the coast of Japan is expected to have. If they have precursors, those precursors may not be detectable, given "ground noise." A magnitude 7 earthquake under Tokyo may be a case in point. Scientists especially worry that too much dependence--and faith--may be placed by the Japanese people in them. They know the limits of earthquake prediction. They would rather concentrate on Tokai, or at most Tokai and South Kanto, lest they and their resources be spread too thinly. On the other hand, what is to be done about the Akita-type earthquakes? Once a nation embarks on a highly publicized attempt to prevent a disaster in one place, how can it refuse others? Ironically, scientists are on the spot in this debate. Expectations have been raised that something can be done to predict. There is a mismatch between what society needs (and demands) and what science can provide.

Implications for the United States

In October 1981, SCEPP, an activity established by the State of California and FEMA to upgrade prediction/preparedness in the southern California area, went to Japan to see what lessons might be learned that they could transfer to America.²⁰

SCEPP was impressed with what it saw, and has called for the transfer of the Japanese program, almost in total, to the United States. It has recommended that an operational prediction system be established for southern California and a small panel of scientists be asked to monitor data from the instrumented area on a regular basis. It has asked for the U.S. to move from a passive to an active prediction/preparedness system, with agreements negotiated, as necessary, with media, state and local governments, and the private sector, to help make prediction response a reality. SCEPP asks that California create an earthquake preparedness office to oversee comprehensive planning throughout the state, as well as special revenue generating policies to finance earthquake mitigation and preparedness. It called for prediction of the catastrophic California earthquake to be a high priority for the existing U.S. national earthquake program. However, it stopped short of recommending an American version of LECA, possibly because there is a National Earthquake Hazards Reduction Act (1977) on the books that could be interpreted as providing much of the requisite authority. SCEPP has actively sought to interest governmental officials as well as the U.S. seismological community in transferring the Japanese experience to the U.S. Thus far, it has had no luck.

It is understandable why this effort to transfer has not succeeded. The conditions in Japan were rather special. First, there was relative consensus scientifically in Japan that the Tokai earthquake was imminent and predictable. There is not that kind of scientific consensus in the United States about, say, the expected earthquake

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SCEPP Report.

in southern California. This earthquake is believed to have a better than 50 percent probability of coming within the next 30 years.²¹ Thirty years seems a long time to most people.

Secondly, there was political leadership in Japan, from the affected prefecture. No California governor has yet taken on the mantle of "Mr. Earthquake" that Yamamoto of Shizuoka has. This is because there is not the sense of urgency. It is a future governor's problem. Without political leadership, especially from the affected state, no great change in policy is likely from the national government. California politicians might well benefit from the approach of the Japanese. There, Governor Yamamoto has seen earthquakes as an asset rather than as a liability. Arguing that protecting the people is a primary responsibility of government, earthquake preparedness has been easily justified.²²

Third, there was a favorable and attentive public opinion. This was provided by the media coverage which was in part sensationalistic, in part, educational. The NHK programs in particular may have provided a longer term base of awareness when much of the sensationalistic uproar associated with the Ishibashi prediction died down. The American media, even in California, deal with earthquakes only rarely.

These last two factors reflect the differences between Japanese and American culture. There are elements of Japanese culture which lend themselves more neatly to earthquake preparedness policy than the

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Federal Emergency Management Agency, An Assessment of the Consequences and Preparations for a Catastrophic California Earthquake: Findings and Actions Taken (Washington, D.C.: FEMA, 1980), p. 3.

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G.M. Berger, "Historical Perspectives on Political and Social Features of Disaster Mitigation in Japan: Preparing for the Tokai Earthquake," UCLA. pp. 4-5. Some politicians have used earthquakes in a prudent manner. Los Angeles Councilman Hal Bernson is one. Mayor Tom Bradley has also taken some initiatives in the field.

"American way" does. Vertical rather than horizontal relationship characterize both personal and professional associations. This serves to transfer information so that society as a whole is aware of technological advances and similarly that technological advances can be responsive to societal needs. Further, this characteristic encourages the open exchange of information with little of the territorial protectiveness common in the United States.²³

Fourth, there was a major quake in Japan at a time when proposals were on the governmental agenda for decision. This quake cost lives, and the confusion over aftershock warnings solidified consensus about the need to do something about the Tokai quake and its prediction. California has had its Coalinga, but no lives were lost, and its impact on public policy has been modest.

Thus, the United States has none of the basic conditions that made LECA possible in Japan. This is not to say those conditions cannot change. However, they are not present as yet.

Underlying these four conditions is the fact that, in Japan, earthquakes are perceived as a national problem. They may well be a national problem in the United States as well. Earthquakes have occurred elsewhere than California, including the largest of all, the 1811-12 tremor in New Madrid, Missouri. But, still, earthquakes are generally seen as primarily a California problem. As long as this is the case, earthquakes will be interpreted as being a regional, not a national, policy issue. This reality must change, or be changed, to provide political support for a program similar to what Japan now has.

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G.M. Berger, "Historical Perspectives on Political and Social Features of Disaster Mitigation in Japan: Preparing for the Tokai Earthquake," (UCLA, 1984), pp. 6-9. See also, Chie Nakane: Japanese Society. Berkeley, California: University of California Press, 1970.

There is one more factor that seems to distinguish Japan from America. That is the sense of shared responsibility. Once the reality of the Tokai earthquake was fully accepted, it was possible to get governments at all levels, the scientific community, the media, business, and citizen groups, to work together in the face of a common threat. This coalescence did not come easily. But the various elements concerned with earthquake policy did eventually come together, and, for the most part, have remained in alliance. This accomplishment in shared responsibility for facing a big problem, with an attitude of "Yes, we can," is a model for the world. It is a model the United States might well emulate, in earthquake policy and other areas.

PART VI

AN INTERMEDIATE POLICY SETTING: CALIFORNIA THE GOVERNOR'S TASK FORCE

Governor Brown and the Great Earthquake

In the early summer of 1980, while federal, state, and local officials were at work on studies and plans that would eventuate in SCEPP, the seeds for a second organizational innovation in California were being laid. This became known as the Governor's Task Force. At the time, President Jimmy Carter and Governor Jerry Brown were vying for the Democratic nomination. Assisting him in his campaign was William Whitson, in his mid-50's, and then in the process of retiring from a high ranking position with the Library of Congress and moving to California. Whitson had himself become interested in the earthquake issue and was trying to alert Brown to the matter.

By July, however, with the Carter-initiated National Security Council (NSC) study underway, Brown was indeed interested. On July 4, the two men were in Oakland, and the issue was raised. There is some question who raised the matter first. Either then, or shortly thereafter, Brown informed Carter that he was "bringing Whitson to California to pull this [earthquake] thing together for me." When Whitson heard about this from Brown, he was surprised, but interested. By September, he was living in California, and talking with Brown about earthquakes.

Brown, on September 3, received a briefing in Sacramento by John Macy, head of FEMA, regarding the NSC study. In September, Brown and Carter met in Los Angeles and discussed the earthquake issue again. At this point, coming off the abortive Brown campaign, Whitson and Brown were close, and Brown was using Whitson as his principal adviser on earthquake policy. Brown was, in fact, at

Whitson's home in the Napa Valley, north of San Francisco, at the time that the state legislation establishing SCEPP was up for Brown's signature. Brown had the SCEPP bill, AB 2202, with him at the time of his visit, September 23. He asked Whitson his views on the bill, and Whitson advised a positive response. Brown signed the SCEPP bill into law then and there.

In October and early November, Whitson spent considerable time meeting and discussing earthquake matters with various state officials and knowledgeable citizens in California. At Whitson's behest, California's earthquake problem was the subject of a special Emergency Council meeting on November 19. The Emergency Council was an interagency advisory group to the governor consisting of the heads of various organizations with emergency responsibilities (e.g., the Office of Emergency Services (OES), National Guard, SSC, California Highway Patrol, etc.). The governor had never attended a meeting of his Emergency Council before. He did attend this one, and stayed for an hour.

Brown asked this question: "Is there an agreement on the Great Earthquake?" No, was the answer. Brown then asked: "Are we satisfied with our existing procedures?" Again, the answer was no. They might be acceptable for a moderate earthquake, but not a catastrophic one. His third question was: "Can you get me a program for fiscal year 1981-82?" The question was meant for all, but particularly for Whitson, whom the governor identified as the man to lead the effort on his behalf. In the view of observers, Brown was responding to Carter's initiative (SCEPP) with one of his own.

Whitson, working as a special assistant to the governor on a consulting basis, had one month to come up with a program, since the governor's budget would be readied at the turn of the year. While Whitson put his own stamp on the program as it evolved, the time constraints meant that he had to rely primarily on proposals from the various agencies for specific programs.

On December 19, a draft program was ready and Whitson wrote the governor accordingly. The Whitson "stamp" was the emphasis on private sector involvement. This would be achieved by establishing a large citizen-based task force. The task force would be composed of approximately 30 separate committees concerned with various aspects of preparing California for a great earthquake. Each committee would also include public sector members, but it was essential, in Whitson's view, to involve the private sector because a catastrophic earthquake would overwhelm the resources of the public sector, at least initially. Hence, the private sector--the citizens of California--had to be brought to a new awareness, both of the threat and what they could do for themselves, through self-help, in the immediate aftermath.

What the various agencies added to the program were a range of needs, such as new equipment to aid in the areas of threat assessment, communications, heavy rescue, fire fighting, and law enforcement. They also asked for new staff for accelerated planning, training, and outreach to the private sector. The total cost of the core program the next fiscal year would be \$4.3 million. The aim was to bring the state up to a higher state of readiness by July 1, 1982. It would constitute the first phase at what would have to be a continuing and probably growing effort as the time of the great quake approached.

In January, a formal report to the governor was revised and polished, with the aim of its release as back-up to a legislative submission. It was sent, in final form, to Governor Brown on February 6, 1981. Virtually at the last possible moment, on February 9, Brown ordered his budget staff to include the proposed \$4.3 million program in his budget exactly as requested by Whitson. The Brown initiative was ready to be made known.

Shooting Down The Governor's Program

While the leader of the southern California project was staffing his enterprise and formulating a plan of action, Whitson was also

active. He was working on behalf of Governor Brown in attempting to get a task force and comprehensive earthquake program established. The ad hoc group (essentially derived from all state agency officials with emergency responsibilities) that Brown had appointed, under Whitson's leadership in November 1980, had produced a set of recommendations. Among these was a Governor's Task Force to mobilize interest in, and readiness for, a catastrophic quake. The governor, via executive order, authorized creation of the task force in February 1981. Support for the task force and other recommendations required passage of legislation with a proposed \$4.3 million budget. In addition to task force support, the money would fund an emergency public information center (\$730,000), tests and training (\$2 million), an emergency management information center (\$1 million), and various other activities. Now the problem for Whitson was to gain support for the \$4.3 million proposal from the legislature.

Governor Brown, who did not have a very close relationship with the legislature at all, officially announced his intent on February 9. This date was quite significant, for it was the tenth anniversary of what was then the last major earthquake to hit California, the San Fernando quake. The governor's announcement was given a dramatic background as emergency officials from various state and local agencies staged a response to a mock earthquake. Orders were given from an underground bunker, four stories beneath Los Angeles City Hall, and helicopters were sent to lift out casualties from devastated areas. The "rehearsal" helped augment media attention for the governor's message.

The governor signed an executive order setting up a Governor's Task Force under the leadership of Whitson. The task force, to be composed of public and private representatives, would work to prepare California for dealing with a quake far, far greater than the San Fernando event. The task force would implement the \$4.3 million earthquake preparedness program that the ad hoc group under Whitson's leadership had formulated.

"The question of a catastrophic earthquake is not 'if,' but 'when,'" the governor told a news conference, February 9. "It is a certainty, and it will kill thousands of people, and we're not ready. People must organize on a block-by-block basis because the government won't be able to help you," Brown said. The task force would consist primarily of private sector people, although it would be headed by a steering committee of state agency officials and some private sector and federal people. The task force would cover everything from communications to mortuaries training. It would prepare a plan for dealing with a catastrophic quake by July 1982. The plan would include volunteers, trained to help prepare their neighbors for the disaster and to organize local efforts after it.¹

The governor's proposal, a complete endorsement of the plan recommended by Whitson, was well received by the media. In January, FEMA had issued its public report, based on the NSC study, An Assessment of the Consequences and Preparations for a Catastrophic California Earthquake. The media was well aware of the problem, as seen by this report. The San Francisco Chronicle editorialized its "support for Governor Brown's modest proposal for a comprehensive earthquake response plan for the state, including eventual construction of earthquake-proof command and coordination centers in northern and southern California." The financial request was "reasonable in view of the magnitude of the task of effective preparation."²

The Los Angeles Times had similar views. It commended Brown for authorizing a task force to see to it that the emergency preparedness recommendations made last fall were actually carried out. It said his words reenforced those of NSC, whose study [issued by FEMA] "contained chilling findings." The country was "essentially unprepared," the Times noted, for what the NSC/FEMA report said would be

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"L.A.'s Dress Rehearsal for Disaster: Preparing for Super-quake," San Francisco Examiner, February 10, 1981, p. D16.

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"Quake Planning," San Francisco Chronicle, February 11, 1981.

impacts that "would surpass those of any natural disaster thus far experienced by the nation"--the worst disaster "since the Civil War." The Times commended Brown for taking "needed steps" in creating the task force and proposing the \$4.3 million program."³

The reception the Brown proposal got in the Legislature was not supportive. His problems began with an assessment of the proposal by the legislature's analytic staff. The analyst from the legislative office who studied the proposal provided a highly critical staff report to the legislature on February 18. In recommending deletion of the \$4.3 million program, the analyst complained that the governor had not provided enough background information to permit a proper analysis of its utility.⁴

Brown responded February 19, calling earthquake preparations "a key priority of mine in the next year and a half."⁵ This item was one of three the analyst felt could be cut from the governor's \$24.6 billion budget. Brown reacted in a press conference saying that most new ideas are attacked on the ground of insufficient backup. "Anything that's new doesn't have quite the same data base as things that have been around for a long time."

"So that is a normal response of the financial analyst. And that's why financial analysts can't provide the vision or the ideas to move an organization forward." He insisted that the necessary detail to back up his request for the money to prepare for a major earthquake, expected before the end of the century, "is there for those who would wish to read it."

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"Be Prepared," Los Angeles Times, February 12, 1981.

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Jeff Raimundo, "Brown Sets Crime, Quake Fight," Sacramento Bee, February 20, 1981.

5

Ibid.

"It will be the greatest disaster ever to take place in the United States," said Brown. "That requires much more preparation than even I have proposed.

"We are going to spend the money, we are going to develop the communications capacity, we are going to have drills."

"In my judgment, this will exceed any preparation that was made during World War II for air raids, because this is not a possibility, this is a probability."⁶

Brown's real problem with the legislature lay not with the analyst's office, but with the legislators themselves. Brown's style was to act--perhaps, more correctly, react--to problems as they arose. The Carter initiative was a problem. He had to react with his own earthquake effort. But in making the program his own, he did not seek to share credit or even communicate with key legislators whose support he had to have in order to get passage. They were informed, not truly consulted as equals. Indeed, there were elected officials in the legislature who claimed, with strong evidence, that they knew more about the earthquake problem than did Brown, and that he was not really serious or informed about their issue.

In April 1981, the \$4.3 million program was considered in the assembly, where Vicencia, principal backer of the SCEPP bill, was the key legislator on earthquake matters. The decision, made April 8, was that the governor get \$2.4 million. This was far less than the governor had wanted, but enough for a substantial beginning. The much more serious problem for the governor lay in the Senate. Senator Alfred Alquist, as chairman of the Senate Finance Committee, would be determinative. Highly critical of Brown in general, Alquist was especially angered by the governor's preemptory action on the earthquake issue--Alquist's issue. If anyone in the legislature had to be wooed to get the \$4.3 million program passed, it

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Ibid.

was Alquist, because he not only had genuine expertise on earthquake policy (he was the "father" of SSC) but he controlled money decisions through the Finance Committee. There is no evidence Brown made a personal attempt to get Alquist's support.

Instead, Brown relied on Whitson, an untried newcomer to the complicated California legislative scene, to carry the ball. Whitson, along with SSC director, Robert Olson, and the senator's aide, Vincent Montane, met with Alquist in April. Whitson made a presentation in an effort to win the Senator's support. After he had made his statement and left, Alquist told Olson he would give nothing to the governor. Olson attempted to argue that preparedness and response needed greater attention. He pointed out that Whitson had already been working energetically to get a number of prominent and able Californians involved in the task force who had previously not been active in the earthquake field. Whatever Alquist might have thought of the governor or his style vis-a-vis the legislature, the fact was that more on earthquakes had to be done. As Olson recalls, Alquist listened and then said: "Ok, maybe I'll give them \$319,000." He then walked out the door. Olson looked at Montane and said: "The decision has been made." Montane nodded his agreement.

The \$319,000 figure was in the overall program to cover administrative costs for the Governor's Task Force. There would thus be no "action" programs of the kind OES, the National Guard, and other emergency related state agencies wanted.

On May 10, apparently aware of the dim prospects for the earthquake program, the Los Angeles Times spoke out in favor of the governor's original total. It declared that the Brown budget marked "the first real financial commitment" by the state "to help it educate the public on measures to take in the event of an earthquake, and improve communications and other coordination of emergency services." It went on:

The governor's proposal may be a victim itself of a turf war. Sen. Alfred E. Alquist (D., San Jose), chairman of the Senate Finance Committee and author of the bill that created the Seismic Safety Commission, doesn't think the Office of Emergency Services [the agency which would receive and then allocate the proposed funds] has been doing its job effectively. More to the point, he views Brown as a latecomer to the earthquake safety issue, and questions his commitment.

Latecomer or not, Brown is the governor, and his support stirs public consciousness on an issue such as earthquakes. One of Alquist's aides predicts that the task force will receive less money rather than more on Thursday, the idea being that it should first prove that it can coordinate the agencies involved. The Senate Committee risks dooming the task force to failure if it makes further cuts. Ultimately, the people of California could pay in lost lives and property for such false economy.⁷

On May 19, a subcommittee of the Senate Finance Committee, essentially controlled by Alquist, met to consider the governor's \$4.3 million request. The director of OES, Alex Cunningham, Whitson, and Major Gen. Frank Schober, Jr., of the state's National Guard, spoke strongly in favor. Olson sat in the audience and said nothing, knowing the result was foreordained. The subcommittee cut all but \$319,000. The subcommittee's action was taken on a 2-1 vote, with the dissenter wanting to eliminate even the \$319,000 for maintenance of the task force.⁸

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"White Power, Dark Thoughts," Los Angeles Times, May 10, 1981, Part IV.

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"Panel Amputates All But \$319,000 from Brown Earthquake Package," Sacramento Daily News, May 5, 1981, Sec. 1, p. 5.

Alquist, who held that \$319,000 would provide the task force the opportunity to do the planning not reflected in the governor's proposal, declared that: "The question is what is acceptable risk and how much are we willing to spend?" In view of what he had been told by the governor's representatives, he said he was not about to spend the \$4.3 million requested. Alquist was obviously not even sanguine about the task force. Apparently referring to the fact Brown had already established a Governor's Task Force via executive order, he accused the Brown administration of "enacting a new program without legislative approval."⁹

On June 9, a conference committee met to settle the difference between the two houses on funding for the governor's earthquake program. The decision was for \$319,000. The task force thus survived, but its capacity to perform was severely curtailed. It was purely a planning effort now. Its operating arms were eliminated. Cunningham and other state agency administrators who would have benefited were frustrated. Whitson was also frustrated, but was determined to keep trying. He was disappointed that he had not had help from the governor on the legislative front, but he remained loyal to Brown, and continued to believe the governor was sincerely interested.

The Governor's Task Force Gets Under Way

In February, March, and April 1981, Whitson had worked assiduously to assemble some 33 task force committees. While there was primarily state government representation on a steering committee, the dominant membership of the other committees was from the private sector. Whitson had talked initially with a few prominent individuals and had gotten their interest. These individuals got others aboard. The effort snowballed until hundreds were willing to be involved.

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Ibid.; "Brown's Quake Plans Crumble," Sacramento Union, May 20, 1981; "Brown's Quake Plan Gets Shaken Up as Panel Cuts Funds," Sacramento Bee, May 20, 1981.

On May 11-12, Whitson held a meeting of those already committed. On the second day, James Davis (state geologist) attended, and said that those 45 years of age or younger would witness the great California earthquake. Whitson conveyed his view that it was the people of California versus the earthquake. This was a great catastrophe; it was inevitable; it was a challenge that a cross-section of California's leadership had to accept.

Then, on May 19, the Alquist committee met and made it clear that there would be \$319,000, rather than \$4.3 million allocated to the task force. It was a blow. Whitson wrote to those who had already indicated an interest in continuing, and most confirmed their intent. The problem now was what would the task force do? Planning only could proceed. Funds would be available from July 1981 to July 1982 to pay task force administrative expenses.

Whitson was in a difficult position. He had been thinking on a very large scale. But now he had few resources. It was not at all clear to him that he even had the attention of Governor Jerry Brown, who seemed preoccupied with other matters now. He was nominally attached to OES, but there was little professional or personal support to be gained from that quarter. What OES did do for him was to make available an intelligent and committed emergency management staff member, Jane Hindmarsh, as his administrative assistant, as well as some other OES personnel, as needed. Whatever the skills of Whitson and Hindmarsh, there was little question that they were stretched thin by the need to coordinate the 33 task force advisory committees Whitson had set up. There was no senior administrator between Whitson and Hindmarsh. This was a gap made all the more apparent by Whitson's preference for conceptualization over day-to-day management.

Whitson's view was that the Governor's Task Force should not be managed from the top down. He had a vision of a society built around a new consciousness. It was this vision that had caused Whitson to support Brown's campaign for the presidency. He believed

he and Brown were on the same wave length. He knew Brown critics referred to the governor as being "far out," or "Governor Moonbeam." But Whitson understood what the governor wanted. The Whitson vision (which he believed Brown shared) was not an anti-government view, but it was a view based around self-help. The Great Earthquake was just the kind of challenge that could give rise to the public's taking command of its own affairs. We Are The Earthquake Generation was a book Whitson had read and taken seriously.¹⁰ It was a book of prophecy, based on the work of psychics. Before working for the Library of Congress, Whitson had been a military officer and Rand strategist. He had then experienced a personal renewal and wanted others to share that. He believed the struggle against the earthquake would help bring that about.

His call for a "consensual vision"¹¹ on the part of Californians in the face of a common threat hit a responsive chord with many thoughtful people in a variety of fields. His major point was undeniably true. In the immediate wake of a catastrophic earthquake, the affected publics would need to help themselves. They could not depend on "the government." To reach the necessary state of preparedness required almost a mass movement. That was what Whitson was after. The Governor's Task Force was a vehicle and the Great Earthquake the catalyst. He had expected originally to start with hundreds and move, within a year, to thousands. But the legislative defeat meant the pace might be slower.

As of May, he had approximately 350 task force members with varying intensities of interest. The organization had him as director, serving under Brown. There were two general committees: steering and statewide planning. These were led primarily by state govern-

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Jeffrey Goodman, We Are the Earthquake Generation (New York: Berkley Books, 1981).

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Emergency Task Force on Earthquake Preparedness, Report to the Governor, Sacramento, CA: State of California, February 1981, p. II-3.

mental officials. They cut across the various state agencies. There was also FEMA and SCEPP representation. In including the director of SCEPP and its Policy Advisory Board's chairman, Whitson served notice he wanted to cooperate, not compete with California's other organization for earthquake innovation. As he saw it, SCEPP was focusing on prediction and preparedness, whereas the task force was working mainly on the first 72 hours of response after an event. Also, SCEPP was oriented toward a single region, whereas the task force was working with all of California. Finally, SCEPP was talking to single institutions (planning partners), whereas the task force was dealing with a range of functional areas (e.g., transportation).

Whitson was chairman of the Steering Committee and Jack Kearns, second in command at OES, headed the Statewide Planning Committee. However, all the rest--what might be called the functional committees--relied primarily on members from the private sector. This was deliberate on Whitson's part. Each member carried a formal assignment from Governor Brown to serve. Most considered it an honor when they were asked to participate. They were grouped into three major categories: (1) direction and control; (2) operations; and (3) resource management. Each category would eventually have a chairman. However, this was intended from the outset to be a rather "flat" or non-hierarchical organization. The functional committees were expected to be quite autonomous. The list of task force committees was as follows:

Director
Steering Committee
Statewide Planning Committee - Local Government Group

Direction and Control Group
Communications
Damage/Engineering Services
Direction and Control Systems
Disaster Intelligence and Assessment
Management Information Systems
Productivity
Public Information, Warning and Education
Recovery Strategy
Threat Analysis and Assumptions
Training Exercises and Tests

Operations Group

Construction, Demolition, and Heavy Equipment
Coroner Services
Fire Services
Law Enforcement and Security
Mass Care
Medical Services
Registration/Inquiry
Route Recovery and Traffic Regulation
Search and Rescue
Toxic Hazard Control
Neighborhood Self-Help

Resources Management Group

Air Transport
Electrical Power Systems
Finance and Monetary Services
Food Distribution Systems
Ground Transport
Legal Advice and Assistance
Marine Transport
Medical Supply Distribution
Petroleum Fuels Distribution
Waste and Water Systems

It is not at all clear that Governor Brown was very aware of whom he had invited to join his task force. The motivation, leadership, and letters of invitation were supplied by Whitson. However, the fact that the letters carried the Governor's imprimature helped Whitson in his recruitment efforts. It also helped Whitson keep his autonomy from OES, through whom he was paid under contract.

Between May and July, Whitson's primary problem was to convince those who had joined the task force that the cutback in funds did not mean there was less to do. It was all the more reason to be self-reliant. On July 1, the Governor's Task Force received its funds, and thus became "official." Its stated objective now was "to foster a high state of readiness for a catastrophic earthquake by 1 July 1982." The strategy for achieving that objective sought the maximum participation of private citizens in a five-step process:

1. Obtaining wide agreement on and understanding of the implications of a "catastrophic earthquake" (Threat Scenario);
2. In the context of that threat, evaluating a key group of current government plans (Plan Evaluation);

3. Recommending improvements in government plans (Annexes);
4. Expanding the network of private sector participation to earmark selected private resources and tactics (Outreach); and
5. Testing new public and private sector plans (Testing) with particular emphasis on an effective Command Center, clearly capable of managing both public and private sector resources.

The various task force committees began meeting. Most worked hard; a few did little; others were in between. Whitson fired one chairman before the summer was out. He had expected a certain bumpiness in getting started. The task force consisted primarily of volunteers. Many were new to earthquake policy. A great deal of consciousness raising and learning were necessary in July and August. The question "why are we here" was asked in a variety of ways many times. Public and private sector people on each committee found they had to find ways by which they could speak the same language. Even when a committee consisted mainly of government representatives (as the steering and planning committees did) there were communication problems. In part, these problems were due to bureaucratic rivalries and long-standing disagreements (as among SSC, OES, and National Guard). Committees met every two weeks, monthly, or less frequently. The task force's performance, initially, was quite uneven.

Various presentations were made to the committees on a range of subjects as part of the consciousness raising, educational phase. Whitson's unorthodox approach was seen in his request that the task force hear from Marsha Adams of Stanford Research Institute. Her view was that earthquakes could be predicted on the basis of scientific statistics and human sensations. Her views may or may not have had scientific validity. James Davis, state geologist and principal scientist on the task force, made it clear that she did not speak for the scientific community. It was one of a number of incidents that caused some members of the task force to look askance at Whitson.

Whitson did not care if he was controversial. He was trying to open the minds of people to a new problem and new ways of thinking. After all, no one attending those meetings had ever witnessed a catastrophic earthquake in California. People who had never thought about earthquakes, much less the kind that came only once every 140 years, were now aware, interested, and writing memos to one another. Whitson was even trying to get Hollywood personalities involved. There was frustration among task force members about the looseness of it all and lack of central direction. Whitson took this all in stride. It was necessary to let the "consensual vision" emerge from below.

For Whitson, who had worked as a Pentagon war planner, the problem was to get public and private people to "think about the unthinkable." As the governor's man on earthquakes, Whitson was the target of numerous reporters and writers and he freely granted interviews as part of his personal crusade to broaden awareness. "The people in California are going to pay the cost of another Viet Nam in terms of lives lost and property damaged," he was quoted as saying in August. "And we're going to face hard choices when it happens. I mean, what do you do when you have to decide which fire to put out and which fire to let burn? What do you do about 50,000 dead bodies? Hell, there aren't enough coroners in the whole state to handle that many at once."¹²

He declared that the legislature's decision to vote down Brown's \$4.3 million request in favor of \$319,000 would not stop the task force. He was going after corporate donations of various kinds. "We'd like to get a company to give us some computer time to war-game these things." In his view, the odds--and balance of terror--were on his side. "It's a classic example of risk analysis," he declared. "If I'm wrong, then the money we didn't spend

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Jonathan Kirsch, "Confessions of a Seismophobe," New West, August 1981, p. 76.

for what I'm calling a worst-case scenario will be forgotten. And--who knows?--I may be wrong. But what if I'm right."¹³

At this point in the evolution of the Governor's Task Force, the most immediate question each committee had to answer was the nature of the threat from its functional perspective. What did a catastrophic earthquake mean for communications, law enforcement, medical services, toxic hazard control, transportation, etc.? James Davis headed the Threat Assessment Committee. Davis and his committee were working with the other groups in developing appropriate assessments. This entailed going over existing damage estimates. There had been such assessments made in the early 1970s for the San Francisco Bay and Los Angeles Metropolitan areas by the National Oceanic and Atmospheric Administration (NOAA). In addition, there was the NSC/FEMA report of 1980. On August 18, Davis asked the task force committees to "summarize the insights which you glean from members of your committee who have experience in earthquake hazard analysis or in the alternative from sources which you have access to such as a corporation--which have developed their own damage assessments for management purposes." Davis pointed out the severe limits of accurate earthquake damage forecasting, but made it clear that his committee, in cooperation with others, would do its best.¹⁴ The work by the Davis committee seemed critical in bringing focus to the task force's deliberations.

Another integrating goal was the need to augment the existing state emergency plan with a special plan for dealing with the great earthquake. Jack Kearns, chairman of the Planning Committee, played an important role in emphasizing this as an integrating goal. One could see, at the outset, some of the "products" the Governor's Task

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Ibid.

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Memo to Steering Committee, Chairmen of the Advisory Committees of the Governor's Earthquake Task Force from James F. Davis, state geologist and chairman of the Threat Assessment Committee, August 18, 1981.

Force might produce. Getting them done--through 33 committees, involving 350 people--was the problem. At the end of the summer, there was much frustration within the task force about the unwieldiness of such a large group. But for Whitson, participation was a value in and of itself--part of the genius of this particular kind of catalytic organization.

Planning For The Task Force's Future

As the various functional committees got under way, Whitson was acutely conscious of the limited lifetime the Governor's Task Force faced. He had to come up with an acceptable program for the legislature or the task force would end July 1, 1982. Yet, he found it difficult to discuss the future with the task force's Steering Committee which had overall policy responsibility. In July and August 1981, Whitson tried to raise the matter with the Steering Committee. He found the National Guard, OES, and California Highway Patrol did not want to discuss it. They saw a new (rival) agency being created. So Whitson decided that this matter was not one that could be resolved by the task force itself, given the vested interests of member state agencies.

He also found that he would get no help from Governor Brown. Brown definitely had other priorities now, including a race for the Senate. The dominant force in the legislature likely to control the decision on the task force's future was Senator Alquist, and he was hardly enthusiastic about Brown's task force surviving.

So, who cared? Whitson cared, so did a few others long in the state earthquake policy field who felt the involvement of the new, private sector people was exceedingly important and energizing. This had to continue. Those who felt that way were SSC's Olson, and legislative staff men Lang and Montane. They regarded the task force as too important to drop. They were also cognizant of budget deadlines, and the fact it would take further legislative action to extend the task force. They were not sanguine about the task force's perfection. It was slow moving, unwieldy, constantly going off on

tangents, and often seemingly disorganized and duplicative. But they saw value.

In mid-November, Olson, Montane, and Lang told Whitson they thought the task force could be saved if placed under SSC. They would go the legislative route with Senator Alquist. He would not be interested if OES were the repository for the task force. Whitson would have preferred keeping it as the Governor's Task Force, in part because he felt it was essential to avoid having the task force lose status and become just another counter in state bureaucratic warfare. His problem was getting Brown to take an interest at this point.

Whitson and the others began working on a proposal that might be acceptable both to the legislature and the governor. This went through numerous drafts and approvals culminating in the Steering Committee of the task force. On December 15, Whitson wrote Brown concerning developments.¹⁵

He pointed out that he was responding in part to requirements Brown had laid down in his Executive Order of February 9, 1981, setting up the task force. In that order, the governor had said that the task force should be seen in the context of "tightened" and more comprehensive management of all hazards confronting California. Whitson proposed a phased realignment of state emergency functions. The task force would be shifted to the SSC on July 1, 1982, with the designation at the same time of a special assistant to the governor who would simultaneously be director of OES. This could be accomplished relatively easily, said Whitson. Subsequently, the many councils and commissions (including SSC) would be consolidated into a new California Emergency Commission. This body would be, in effect, an all-hazards SSC. It would have a small staff. Its membership would come primarily from the private sector. It would anticipate hazards, evaluate preparedness, and recommend needed

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Letter, William Whitson to Governor Jerry Brown, December 15, 1981.

policy changes. The new organization was to be brought into being July 1, 1982. If that were not possible due to legislative requirements, it should be done as a second phase realignment on July 1, 1983. The task force would then be under this new body. Whitson recommended that the governor take some additional steps that would improve the state's capacity and raise public awareness. These included:

- 1) Your pre-designation of four representatives to assume overall command of the state's regional command center after a great earthquake;
- 2) An urgent inventory of existing state government data processing and command centers;
- 3) Your support of the County Earthquake Task Force movement;
- 4) A major press conference on 9 February 1982 to announce Brown Administration achievements and near-term "next steps"; and
- 5) A major publicly-sponsored, privately-funded California-Japan Earthquake Technology Convention in late 1982 to focus on information management, communications and self-help in a great catastrophe.

Whitson said there was "substantial support in the legislature" for these proposals, and indicated his desire to brief the governor on them. Privately, Whitson was of the view that unless Brown submitted a bill, the legislature would make decisions for him.

On January 19, 1982, an enlarged planning group met to consider the task force's situation beyond July 1. A budget had to be put together by April 1. Participants in the planning group included Lang, Montane, Olson, Whitson, Kearns, Hindmarsh, Terry Tucker from the National Guard, Winston Brooks, Jim Smith, and Robert Hill of the California Highway Patrol. It was agreed that Olson would now take the lead in developing the 1982-83 budget. There was consensus that the governor was no longer interested in making a fight for the task force, and the legislature would rescue it only if Sen. Alquist gave it his backing. The price of that backing was his control through SSC.

In February, Olson's assistant, John MacLeod, began working full time on preparing a new budget for the task force. He proposed a budget including \$195,000 for administrative support and \$1.8 million for programs. These programs included a number of the priorities listed in the previous year's request. They also included a new outreach project for the San Francisco Bay area, modelled on SCEPP.

Olson and Whitson, on April 26, asked task force advisory committee chairmen to express to the legislature their support for the proposed effort.¹⁶ In May, however, the Senate Finance Committee again turned down the program side of the request, and approved only \$195,000 to keep the administrative structure alive an additional year. The reason this time had more to do with the state's budget problems than any overt opposition to the task force. It was a year in which new programs of any kind were having a difficult time getting approved. Alquist was not in a position to disapprove, through his committee, new programs his colleagues wanted, while promoting a program he wanted. What this meant was that the task force would go under SSC, but it would continue purely as a planning body--with less money than before. But it would live a while longer.

The Whitson Legacies

Whitson now had just a few months to go before leaving. As the governor's man, he would be replaced as director of the task force on July 1, 1982. He made the most of his remaining time to summarize what the task force had done under his leadership, as well as point out what still needed to be done.

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Letter, Robert Olson and William Whitson to advisory committee chairmen, April 26, 1982.

In June, he wrote of "Task Force Achievements," and "Shortfalls in California's Earthquake Readiness."¹⁷ In writing of achievements, Whitson pointed out that members of the task force contributed an estimated \$3 million in actual time and materials to California. He declared that "In a succession of large and small meetings, they took three giant steps towards 'readiness:' (1) they designed and mapped a single scenario of geological earth shaking and structural damage for both the northern and southern San Andreas faults [referring to the work led by Davis]; (2) they fostered a new strategy for response to that scenario for the whole society [the "self-help" notion]; and (3) they took dramatic steps to translate that strategy into pre-event actions in both the public and private sectors [via functional planning]."

In discussing the "shortfalls," however, Whitson laid out a number of weaknesses most of which stemmed from what he called the "denial problem." He wrote:

Despite the eight-month effort of 400 members of the Governor's Task Force to portray a "catastrophic earthquake" in words and on maps, key government (and corporate) leaders and planners still assume "business as usual" among outsiders and most insiders. This is the problem of pervasive psychological denial of magnitude. Within government, even on the Task Force Planning Committee, despite a FEMA estimate calling this "The Greatest Catastrophe for the United States Since the Civil War," there is a wide polarization between the minority who believe that this "war" will almost totally divert all California political, economic and bureaucratic energies, and the majority, who believe that a few "professional" (mostly bureaucratic) expeditors in a mobile, slap-dash Command Center will "coordinate" or "manage" the needs of two million people in chaos. This problem of imagination reflects the unprecedented character of "war" among minds trained and experienced in "skirmishes."

Whitson's major points about accomplishment may have been overstated, at least in terms of "new strategy" and "dramatic steps to translate that strategy into pre-event actions." The committees

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William Whitson, "Task Force Achievements: 1981-82, An Overview," June 1982.

were still attempting to reach consensus on strategies and actions. But he was certainly correct about the "shortfalls." And there was agreement that the threat scenario produced by Davis was an outstanding achievement for which the task force could take a measure of credit.

What Davis had done, under task force auspices, was to utilize his State Division of Mines and Geology to project a profile of southern California after the great earthquake hit. The report that was prepared was entitled "Earthquake Planning Scenario for a Magnitude 8.3 Earthquake on the San Andreas Fault in Southern California." As "the Whitson phase" of the task force ended, this most significant product was released to the media, in hopes that it might stimulate enough concern to help with some of the problems mentioned in Whitson's "shortfalls" statement.

On June 27, the Los Angeles Times published a front page lead article based on this earthquake scenario. The Times translated the technical prose of the report into words the public could comprehend. The writer, Lee Dye, pointed out that this scenario included data on what would happen over a five county area--Orange, Riverside, San Bernardino, Los Angeles, and Ventura--if a massive quake hit. It noted that the study was designed to help local planners zero in on their most troublesome areas. The major feature of the southern California report was the attempt to map out "intensity zones"-- areas where the intensity of ground shaking could be estimated based on such factors as the distance to the fault, the nature of the ground strata within each zone, the depth of the water table, and so on.

It pointed out that "a lot of factors influence that. A high groundwater table coupled with sandy or granular soil, for example, makes 'ground failure by liquefaction a strong possibility during a great earthquake.'"

It noted that "the report does not identify specific buildings that would be expected to fall--that is viewed as the responsibility of

local planners who, aided by the study, must conduct structural analyses in high-risk zones to further refine the data."

It stated that "maps published with the report show pockets of high damage potential scattered throughout the region. The widespread dispersal of those pockets underscores the likelihood of chaos during the immediate aftermath of the quake. Virtually all jurisdictions will be competing for emergency equipment and personnel, and moving that equipment from one area to another could be extremely difficult."

It explained that "the report issued by Davis identifies which highways would most likely be closed after an 8.3 quake on the southern San Andreas, and it attempts to assess the damage potential for specific airports, railroads, marine transport installations, and communication, water, waste, electrical, natural gas and petroleum facilities."

The article summarized some of the salient findings from the Davis scenario:

Highways - Many would be closed, including nearly every route through the mountains east of the basin--many for two or three days. . .

Communications - Those telephone facilities that survive the impact will be saturated with calls. The reliability of the phone system could vary substantially throughout the region, but wide areas should expect to be without service--particularly in the Riverside-San Bernardino area and the San Fernando Valley.

Electricity - About 25 percent of the electricity generated within the basin could be lost . . . Most of the power imported from outside the basin would be lost, reducing power availability to about 50 percent of the normal level.

Airports - Runways at most major airports would still be intact, but it is less certain that crucial facilities, such as control towers and fueling lines, would still be functioning. . .

Railroads - Rail service into the metropolitan areas from the outside will probably be limited to lines from San

Diego, but extensive damage should be expected near terminals at the Los Angeles-Long Beach harbors, in the Palmdale and Cajon Pass corridors and possibly in the Ventura area. . .

Water Supply and Waste Disposal - "Two of the three major aqueduct systems that cross the San Andreas Fault will be ruptured and supplies will not be restored for a three- to six-month period." Reservoir capacity in the basin also will be reduced, and some distribution systems will be damaged. Some water supplies will be contaminated by damaged sewage systems.

Natural Gas - Pipelines importing natural gas into the area will be breached near Tejon Pass, south of Palmdale and Cajon Pass, shutting the lines down automatically, but underground facilities should be able to provide gas for many parts of the basin.

Petroleum Fuels - Crude oil pipelines coming into the basin will be disrupted near Tejon Pass, and export lines carrying petroleum products may be damaged in the Cajon Pass area, increasing the possibilities of fire.

Marine Facilities - The ports, with the exception of rail and some other support facilities, are expected to sustain minor damage.¹⁸

The Los Angeles Times writer commented that "all this adds up to a catastrophe of unprecedented proportions, although planners concede that not everybody wants to hear that." He noted that the damage would vary. Wide areas would have little damage, while scattered pockets would be devastated. He noted that planners agreed that "extraordinary measures" would have to "be taken well in advance of the quake."

Whitson, interviewed by the Times, was quoted as saying: "If you don't shift to a new concept in operations we're going to be in deep trouble." He said that the "central issue" in earthquake planning was the old question of "Who's in charge here?"

"California is deeply committed to the concept of local government," said Whitson, and this has resulted in the development of

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Lee Dye, "Planning a Must: Is California Prepared for Big Quake," Los Angeles Times, June 27, 1982, p. I-1.

strong local operational forces in areas such as law enforcement, search and rescue, and emergency response. "The problem is, how do you convert all that routine energy to respond to a nonroutine event."

Whitson reported that he was developing a plan, based on task force work to date, that would give extraordinary authority to officials during the first six months after the quake. The point was that the catastrophe would be so great that "someone" would have to "have the authority to allocate resources and coordinate rescue-and-recovery efforts that will overlap competing jurisdictions." Whitson indicated that simply allowing each jurisdiction to line up whatever help it could would "lead to near-chaos."

While not calling for martial law, Whitson made it clear that something close to that would be required. He said it would be important to have "detailed planning developed with the consent and participation of the governed, that would spell out in advance what is expected." You could not rely on "the market" to make decisions in an emergency, he said. What is needed is a "policy decision center," where the decisions would be made determining who would get what. Such a center would need to have "absolute authority over both public and private resource allocations."

The article cited the Whitson view that planning had to be based on the assumption of at least "two million people directly and immediately burdened by the damaging and life-weakening consequences of the event." People within the affected area will have to carry out the rescue work during the first few hours after the quake. The first priority during that time will be to save the lives of the 50,000 or so critically injured people who will be requiring hospitalization. Since the demand for outside help will be "unprecedented," severe conflicts will arise over "how much and what type of help goes to each area." At present, local officials could go directly to outside resources to try to get any help needed. Under the plan proposed by Whitson, these local officials would deal first with a "regional command center." This center would review requests,

ranking them according to importance, and would allocate outside resources during the initial weeks of the quake. Then, the "policy decision center" would allocate all resources of the impacted area during a period of up to six months, thus serving as an "aid in long-term recovery." A "fundamental shift in the lines of authority" would result, making this plan of Whitson's "political dynamite," in the view of the Times writer.

A second article, the following day, continued the general discussion of the Davis report, going into additional detail.¹⁹

All in all, the publication of the major themes of this report, plus Whitson's emphasis on policy implications deriving from it, served as a major milestone for the task force. The report was a product that attracted great media attention. It could not help but make Californians more aware that what was involved was special, not just another earthquake. Local emergency planners not only now knew where the key problems were located; they knew others knew, via the media. Finally, Whitson had an opportunity to say in public what he had been saying to the governor privately. Perhaps this would rekindle Brown's interest in becoming an earthquake entrepreneur.

The Task Force Under SSC

As of July 1, 1982, the task force had a budget of \$195,000 for one year and it was no longer the Governor's Task Force. It was now under SSC. This meant Bob Olson. But Olson at this time announced he was leaving SSC to become a private consultant. It took a while to sort out the various issues of SSC management. Finally, Richard Andrews of SCEPP became director of SSC, officially, as of October 1, 1982. At that point, Olson stepped down as Executive Director. On a half-time civil service appointment, Olson took on leadership of the task force. He would run the task force from an office provided in SSC's headquarters.

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Lee Dye, "Earthquake Scenario Pinpoints Areas of Greatest Devastation," Los Angeles Times, June 28, 1982, p. I-3.

Olson was impressed with the quality of people on the task force and their willingness to continue even under a constrained budget. He understood Whitson's philosophical approach and desire to maximize participation. However, Olson believed the approach and desire had prevented getting things done. He decided to streamline the steering committee and overall committee structure. The 30 plus committees had to be reduced. Also, priorities had to be set, even if that meant imposing Olson's view on the "consensual vision" emerging from below. In Olson's opinion, the major priorities of the task force in its coming year were: the threat scenario; a concept of operations building on the Whitson concept; plan annexes; test and exercise designs; creation of, and support to, county task forces; 1983-84 budget projections; legislative proposals; and private sector involvement.²⁰ He had a staff person assigned to him from SSC, Jean Laurin. In addition, he called on Ezunial Burts to help him and serve as chairman of the task force. Burts was in a critical position to help in that he also was a member of SSC and was Executive Assistant to the Mayor of Los Angeles.

Shortly after taking charge of the task force (now an SSC task force), Olson cut the functional committees to 17 and divided them into three related groups. Group 1 was Preparedness and Response, headed by Dr. Donald Cheu of the Permanente Medical Group, South San Francisco. Group 2 was Management Systems and Recovery Planning, headed by Allen Wilmore of Santa Rosa; and Group 3 was under the leadership of Joseph Kaspar, California Trucking Association, Burlingame. Olson held a joint meeting of the Task Force Steering Committee and committee chairmen on October 15. The steering committee met November 19.

The primary objective identified for the task force to accomplish during FY 1982-83 was the listing of specific areas where the existing response and recovery system would break down as a result

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SSC Minutes, July 28, 1982, p. 9.

of a catastrophic earthquake in a major urban area. The committees were to be guided in this effort by two threat scenarios developed during the first year of the task force; the initial one noted earlier for the southern San Andreas fault area and another one that had been developed later for the northern San Andreas area. In addition, there were 29 other specific and inferred tasks to be pursued. These ranged from developing a statewide victim tag to working on the question Whitson had always said would be the big one: "Who is in charge?"

The "streamlined" committees worked on these issues, as best they could. Meanwhile, Olson and Andrews also gave attention to the money issue. With no federal funding, the task force was totally dependent on state funding. California, however, continued to have budget problems.

On March 10, SSC recommended that the task force be extended for a year, and that the SSC staff make appropriate efforts to get state funding. On March 21, SSC submitted a request to the Department of Finance for \$131,000 to continue the task force. The extension was for one year. Andrews and SSC chairman, Stan Scott, on March 28, wrote the task force chairmen reminding them to write key legislators to get their support for continuing the task force.²¹

SSC included the task force as part of its overall "package" for the following fiscal year. This package included new SCEPP money, and thereby indirectly linked a financial decision on the task force with one on SCEPP for the first time.

As noted in the report on SCEPP, the Coalinga earthquake occurred on May 2, 1983. This apparently helped influence the new governor, George Deukmejian, to consider more positively the SCEPP proposal. But the task force, a Governor Brown creation, did not escape his general effort to hold down costs. He vetoed the \$130,000 request

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Letter, Richard Andrews and Stanley Scott to task force chairmen, March 28, 1983.

for the task force. The explanation provided was that the objectives of the original executive order had been met.

Saving The Task Force

For many, the task force was dead. However, for one observer, the governor's decision to kill the task force was an opportunity. This was the view of William "Bill" Medigovich, Deukmejian's recent (May 1) appointee as head of OES. Medigovich was an enthusiastic and animated emergency management official in his early 40s. He had worked in mid-management positions in OES, but had also managed to get to know the governor and his staff. When Deukmejian took on the reins of California government, he plucked Medigovich from the ranks, and made him OES's new leader. Medigovich immediately began impressing various long-time foes of OES with his candor. The candor pertained to his willingness to state forthrightly the fact that OES had a poor reputation in terms of innovativeness and imagination and much of this was well-deserved. However, he also made it clear that OES had the basic emergency management responsibility in the state, and he aimed to have OES fulfill that responsibility.

SCEPP and the task force were "where the action was" in new ideas in earthquake management. OES had largely been excluded. Medigovich, himself, had served on one of the task force committees prior to being named OES director. He did not want OES to remain on the sidelines of the new thrusts in earthquake policy. He wanted it in the mainstream. He was exceedingly well placed politically to assert his agency's claims. He had what Cunningham, his predecessor, never had--namely, the support of the governor. He also had the support of FEMA Region IX, as led by an ex-OES man, Vickers. As pointed out in the SCEPP case, these circumstances enhanced OES's bargaining power considerably. They mattered in OES-SSC relations, where SCEPP was concerned. And they mattered in the case of the task force. Particularly important where the task force was concerned was the Deukmejian connection, since the task force was strictly a state-supported entity.

Medigovich thus saw the task force as part of territory to be reclaimed on OES's behalf. It was dead. He was in a position to rescue it. He took the initiative and approached Andrews. They agreed to find a small amount of money in their existing budgets to keep the task force alive. Together, in September 1983, they went to the Department of Finance to discuss the need to continue task force activities. They argued that their intent was not to continue the project indefinitely, but to further specific recommendations. Finance agreed, in October, to let them redirect \$8000 from OES and \$2000 from SSC current year funds to support task force work.

This amount was token. But it would make at least some meetings possible. What was important was that it bought time for the task force--time purchased primarily by OES, time during which OES could work on its own and with SSC, to plan future roles for this entity.

The Task Force Looks Ahead

On January 11, 1984, the SSC and OES jointly brought various chairmen of the task force together. Both Medigovich and Andrews spoke. While Andrews spoke highly of the task force and its accomplishments, it was Medigovich for whom the task force seemed to have a special place. He spoke with enthusiasm about its importance to him, as a previous member of its law enforcement committee. He said he had been "thinking about the unthinkable" in terms of a catastrophic earthquake, and that he had stretched his own imagination beyond the norm in emergency preparedness. The task force was a priority for him, said Medigovich. Its major accomplishments, in his view, were hidden. But it had been a stimulus to help get people involved. It had been an energizing force. When you look back, he said, you find that California has gone forward in earthquake preparedness, and one reason was the task force.²²

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Based on notes of the meeting taken by the author.

He went on to say that OES was proposing to spend \$135,000 on the task force the following year. This would provide funds for two full-time staff members and implementation of some of the recommendations in the task force's June 1983 report. The existing funds would provide enough money to get started this year with the transition, through meetings beginning with the present one. The governor's office would support the task force.

Following this, there was a general discussion, led by task force chairman Burts. [Olson, by this time, had phased out and not been replaced. The expectation was that Burts also would go. After all, he worked for the man Deukmejian had defeated for the governorship.] At the end of the meeting, it was clear there was agreement on two areas for task force attention in the future:

- (1) greater private sector involvement; and
- (2) more attention to direction and control elements.

Subsequent meetings would focus on these areas in planning a work program for the next phase of its activity.

Conclusion

The task force started out with very large objectives. Many of these objectives depended on significant funding which did not come. This was due to the inability of the governor and legislature to cooperate around a mutual goal of earthquake preparedness. However, the task force did bring together many diverse private and public interests that had not been involved before. They discussed problems and solutions, and even came to engage in joint exercises. Many private interests used their own funds to keep momentum under way on task force activities, when public monies diminished. Perhaps the most significant innovation of the task force was the raising of consciousness about the great earthquake, and realization that government would be limited in its response capacity. Hence, the "bottom line" in earthquake preparedness is self-help. The non-

governmental sector must take more responsibility for its own fate.
This has been the principal legacy of the task force to date.



PART VII

THE SOUTHERN CALIFORNIA EARTHQUAKE PREPAREDNESS PROJECT (SCEPP)

FOREWORD

On January 30, 1981, Robert Olson, executive director of the California Seismic Safety Commission, wrote to NSF. A major, new intergovernmental program in earthquake preparedness innovation was just getting started. He believed it should be monitored closely, as it evolved, so that a documentation of this effort would serve as a basis for "outside" evaluation of the program. Dr. William Anderson of NSF brought this letter to my attention as I was beginning a new project, approved under NSF funding, on earthquake policy innovation at the state level. My interests and qualifications matched the needs indicated in the letter. This was an occasion to study an important governmental program from its inception, to see what those involved believed before decisions were made, rather than retrospectively. It was an opportunity and challenge I welcomed.

In succeeding months and years, I followed developments in the Southern California Earthquake Preparedness Project (SCEPP), as it came to be known, intensely. Those involved in the SCEPP process were aware that they were part of a "natural experiment" in policy innovation. They did not know whether the program in which they were engaged would or would not have a successful outcome. What they knew was that they were participants in a singularly important effort to stimulate earthquake preparedness. They were cooperative in this research enterprise, at times displaying remarkable courage in terms of candor. We all were aware that programs such as SCEPP do not come along very often. When they do, they should be documented, for they will provide lessons for future policymakers and administrators in this field. I hope that this case history is

worthy of the assistance I received. In no way is NSF responsible for any of the interpretations or judgments presented in this report.

A. ORIGINS

Background: A New National Policy

During 1975, the United States Geological Survey (USGS), became increasingly aware, through accumulating data, that a major "uplift" of the earth in southern California had recently occurred. The land had risen as much as one foot along a large section of California's southern San Andreas. Centered near Palmdale in the Western Mojave Desert, the uplift apparently had begun in the late 1950s or early 1960s near the junction of the San Andreas and Garlock faults. Measurements indicated it had grown east-southeastward and now included perhaps an area as large as 4500 square miles. The significance of the "Palmdale Bulge," as it came to be known, was not understood. However, USGS scientists were greatly concerned because it was located outside that very segment of the San Andreas that had remained locked since southern California's last great earthquake in 1857.

Frank Press of Massachusetts Institute of Technology, president of the American Geophysical Union, and a leading science advisor to government, communicated the concern of specialists in his community in a letter to Vice-President Nelson Rockefeller on January 21, 1976. The vice-president showed this letter to President Gerald Ford. He wrote:

The discovery, which will soon be released publicly, is most disturbing because such uplifts in the past have preceded earthquakes of great destructive power. . . .

The effect on Los Angeles of an earthquake in the region of the uplift would be quite disastrous. A structural engineer at U.C.L.A., Professor Martin Duke, has estimated that as many as 40,000 buildings would suffer collapse or serious damage.

There is no question that the uplift must be taken very seriously even though geophysicists

have, as yet, no clear understanding of its origin or significance. . . .

The region of the uplift should now be subjected to a most intense scrutiny. . . . In Japan, a geophysical anomaly of this magnitude would trigger an intensive study or a public alert.¹

On February 13, USGS made public the discovery of the uplift. Immediately the Palmdale bulge attracted great media interest, especially in California. On March 3, the USGS director, V.E. McKelvey, wrote Governor Edmund G. (Jerry) Brown of California, requesting a meeting to discuss with him the implications of the uplift.² A meeting did take place, on March 17, involving a number of state officials; however, Brown was unable to be present and was represented by the director of OES, Charles Manfred.

Following the meeting on March 30, Manfred sent out a memorandum to local leaders--chairmen, Boards of Supervisors; mayors; directors of city and county emergency organizations--detailing the USGS findings. Manfred pointed out that USGS was not predicting a quake, but that there was a need and "opportunity to undertake a realistic assessment of our earthquake preparedness and response procedures." Manfred said that OES would keep in close touch with USGS and would keep the governor and local officials informed of any changes in the situation.³

On April 15, James Whitcomb, a California Institute of Technology (CalTech) earth scientist, issued a prediction in the form of a "hypothesis test" which projected a moderate (magnitude 5.5 to 6.5) earthquake in the Los Angeles (specifically San Fernando) area

1

Deborah Shapley, "Earthquakes: Los Angeles Prediction Suggests Faults in Federal Policy," Science 192, May 7, 1976, p. 536.

2

Letter, V.E. McKelvey, director USGS, to Governor Edmund G. Brown Jr., March 3, 1976.

3

Memo, Charles Manfred, March 30, 1976.

within approximately one year from then. The prediction, coming in the wake of the Palmdale bulge, was taken seriously enough by California government that OES asked its scientific advisory group, California Earthquake Prediction Evaluation Council (CEPEC), to judge the validity of the Whitcomb forecast.

Meanwhile, others became excited. For example, Doug Clark, a Los Angeles radio evangelist, devoted a special, one-hour program to earthquakes, the "Jupiter effect," and the Book of Revelation, while offering listeners the opportunity to purchase his own book on earthquakes for a financial contribution. Also, Los Angeles politicians were agitated: "after word of the Whitcomb announcement broke, there was talk in the city council of suing Whitcomb, and anyone else who made earthquake predictions, for any resulting drop in real estate values."⁴ At the same time, the possibility that a prediction might have validity was viewed by others as an opportunity. It was becoming increasingly known at this time that a successful earthquake prediction in China, in 1975, may have contributed to saving the lives of perhaps 100,000 people who evacuated the city of Haicheng in time.

Frank Press stated in his presidential address at the April meeting of the American Geophysical Union that the great achievement of the Chinese scientists had been made possible by the backing they had had from their government, a backing not thus far seen in the United States.⁵

In Washington, there was action. President Ford decided that the federal government had to do something about the California situation. No doubt, he was genuinely concerned. There was also speculation that he was also worried that inaction--and an event--

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Shapley, "Earthquakes: Los Angeles Prediction . . .," pp. 535-536.

5

Allen L. Hammond, "Earthquakes: An Evacuation in China, a Warning in California," Science 192, May 1976, p. 538.

might provide ammunition for a presidential competitor, Californian Ronald Reagan. Whatever the case, \$2.1 million in existing federal funds were reprogrammed so that USGS could intensify its seismic monitoring of the Palmdale bulge.⁶ In addition, USGS and NSF began working on a report, at the request of Ford's science advisor, H. Guyford Stever, aimed at suggesting options for augmenting their earthquake-related research programs. This report was completed in September 1976, and called for substantial increases in earthquake research, including research aimed at prediction.

In January 1977, Jimmy Carter became president of the United States. He chose as his science advisor, Press, who now had the opportunity to build on the momentum for earthquake preparedness he inherited. By this time, the Palmdale bulge no longer had the salience it once had. There was some evidence it was subsiding, although its origins and meaning remained important to understand. Also, the Whitcomb prediction had been found wanting by CEPEC, and the appointed time for the predicted quake had come and gone in any event.

However, the momentum remained. Not only was Press in position, but also two strategically placed Democratic legislators were pushing hard for legislation. These were Senator Alan Cranston and Rep. George Brown. Brown represented San Bernardino and neighboring "Inland Empire" areas, sites most scientists believed would be particularly devastated by a great earthquake on the south-central San Andreas.

On October 17, 1977, the National Earthquake Hazards Reduction Act (NEHRA) was passed. For the first time, earthquakes were given a significant national policy priority. This legislation was comprehensive and long term. It established the national objective "to reduce the risks of life and property from future earthquakes in the United States through the establishment and maintenance of an

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Shapley, "Earthquakes: Los Angeles Prediction . . .,"
p. 536.

effective earthquake hazards reduction program."⁷ The Act established objectives to develop earthquake resistant design methods and procedures; predict earthquakes and characterize seismic hazards; develop model codes in cooperation with state and local officials and practicing professionals; and plan and prepare for, respond to, and recover from earthquake occurrences.

These objectives were to be achieved first, through undertaking a major research program, and second, through the formulation and implementation of a plan for federal actions to reduce earthquake impacts.⁸ President Carter assigned the responsibility of preparing an implementation plan to the Office of Science and Technology Policy (OSTP), the executive office agency headed by Press.

OSTP pulled together a task group composed of specialists from inside and outside government. Among those inside, Charles "Chuck" Thiel of NSF was key. A civil engineer, Thiel was in charge of NSF's earthquake research program. He was strongly oriented toward applying knowledge and looked upon the OSTP assignment as an opportunity to move knowledge about prediction and preparedness toward use. So did many of the others involved, such as the chairman of the task group, Karl Steinbrugge of California.

OSTP Task Force members started before the legislation was even passed, and completed a report outlining "Issues for an Implemen-

7

"Earthquake Hazards Reduction Act of 1977," P.L. 95-124, cited in Section A, Office of Science and Technology Policy, Earthquake Hazards Reduction: Issues for an Implementation Plan, (Washington, D.C.: USGPO, 1978), p. 1.

8

Ibid., pp. 1-2.

tation Plan"⁹ within the deadlines set by the legislation--namely, 210 days following enactment.

The principal problem at this point was that OSTP was a presidential staff agency and what was needed to provide both further planning and leadership for a national earthquake hazards reduction program was an operating agency. At the time the Act was passed, disaster related activities were quite fragmented. Moreover, there were the research agencies (NSF and USGS) but there was no organization with a task to orient such research to an actual event, either in terms of preparedness or recovery. Most federal activities in this area were concerned either with civil defense or floods.

Comprehensive earthquake planning was a bureaucratic orphan. The earthquake act needed an administrative home. On June 19, 1978, President Carter announced that he was amalgamating a number of disaster-related efforts into a new FEMA, and that the earthquake program (other than the NSF and USGS efforts) would go to FEMA. By executive order, FEMA was established officially on March 31, 1979, and the earthquake mission transferred from OSTP on July 15, via executive order. In August, Thiel became deputy associate director for mitigation and research. As such, he was but one step removed from the FEMA director, John Macy. Thiel's organizational responsibility was to take those steps prior to a major disaster that could minimize the deaths and property loss once an event occurred. Known as "Mr. Earthquakes" within FEMA, Thiel wasted no time in using his new base to develop a lead project in the earthquake field. Such a project would give meaning and concreteness to the 1977 Act and subsequent program planning documents.

There was no question in his mind that such a project had to be created in California. That was where the greatest threat was

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Office of Science and Technology Policy, Earthquake Hazards Reduction Issues for an Implementation Plan (Washington, D.C.: USGS, 1978).

believed to lay. Also, what state policy development existed for earthquakes was to be found in California. Finally, FEMA was predicated on the notion of assisting state and local government in disaster management. Whatever FEMA did was supposed to be an exercise in cooperative federalism. President Carter had even said that there could be a "reassessment" of the federal role in disaster assistance if the states did not commit their own resources to this area.¹⁰ Federal policy had a dedicated and zealous earthquake entrepreneur in Thiel. His problem was to find the right ally in California, and hope for a political climate favorable to a joint venture. Only then could the rhetoric of national policy be translated into the reality of intergovernmental implementation.

Awareness of Need in California

As the Palmdale bulge and Whitcomb prediction had led to enhanced awareness of the California earthquake problem in Washington, so it had broadened awareness in California. There was the fear that a credible prediction of a great earthquake on the San Andreas might come and Los Angeles might not be prepared for the prediction, let alone the quake itself. The Los Angeles city government had engaged in a significant series of discussions specifically related to earthquake prediction in 1977, and had produced a report, based thereon, in October 1978. This report had recommended that: "The city should prepare an Earthquake Prediction Response Plan and establish the appropriate coordination and organizational functions to enable a prompt and effective response to any prediction of an earthquake within the region."¹¹

10

Charles Thiel, "Earthquake Hazard Reduction: A Shared Responsibility." Address to the Earthquake Engineering Research Institute, San Mateo, California, February 10, 1979.

11

Sheila Hutman and Rachel Gulliver Dunne, Consensus Report of the Task Force on Earthquake Prediction, City of Los Angeles, (Los Angeles, California: City of Los Angeles, October 1978).

Los Angeles Mayor Tom Bradley was quite concerned, as was his principal assistant for emergency matters, Ezunial Burts. Their expectation was that the new federal earthquake program established under NEHRA would provide the city with the necessary funds to move beyond this initial report to a more detailed city earthquake prediction response plan. At the same time, they strongly backed a local ordinance (which ultimately was approved January 7, 1981) that called for upgrading the earthquake resistance capacities of thousands of unreinforced masonry buildings contained within the city. Those buildings, constructed prior to 1934, were regarded as extremely hazardous in the event of a major earthquake.

At the state level, there had also been more attention given to earthquake preparedness and prediction. In 1976, the state OES had begun issuing information to local emergency officials concerning the Palmdale bulge, the Whitcomb prediction, and the likelihood of a major California quake. By 1978, with the Whitcomb prediction disavowed and Palmdale bulge seemingly subsiding, some of the momentum of earlier years was slipping. However, OES continued to send its reports and also conducted earthquake emergency operations exercises among state and local emergency officials. Moreover, OES worked on earthquake prediction response elements to be included within an overall California Emergency Plan.¹²

Nevertheless, there was considerable unhappiness with the status of California preparedness and with OES on the part of the state legislature. Much of this unhappiness was in the person of state Senator Alfred E. Alquist. Alquist, a senior and powerful legislator from the San Jose area, had helped create the SSC in 1974 to provide a continuing concern for earthquake planning in the state. It was his view that OES was institutionally incapable of mitigation and preparedness planning, being essentially geared to responding after the event. He was angered to find Governor Brown's spending

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Memo, Charles Manfred, director, OES, January 31, 1978.

proposals for 1979-80 calling for the termination of SSC in 1979. The threat to SSC made him all the more "anti" OES as the central earthquake agency in California. There were others in the legislature who shared the Alquist view. As concern grew about earthquakes and earthquake prediction, so also questions were raised about California's institutional apparatus for dealing with such situations. In 1979, Assemblyman Frank Vicencia, chairman of the Assembly Subcommittee on Emergency Planning and Disaster Relief conducted an examination of the California government's ability to deal with earthquakes. OES was found to be lacking. It was particularly unprepared to cope with earthquake prediction.

As Thiel met with various California government officials in his effort to elicit enthusiasm for a joint federal-state project, as a way of beginning NEHRA implementation, he found OES in a highly defensive mood, and not particularly receptive. Another office in FEMA had already attempted to give OES funds for preparedness planning and had been rebuffed. Thiel looked elsewhere for an ally in California, and discovered Joe Lang, a principal staff aide to the Vicencia subcommittee. As Thiel and Lang talked, they focused on earthquake prediction as the lynchpin upon which to base a joint federal-state program. This was the one area in which there was consensus that a major gap in earthquake planning existed. Moreover, in 1979 and early 1980, a prediction seemed a distinct possibility, given scientific observations of seismic activity in southern California.

The basic concept that Thiel and Lang evolved was a prototype prediction response program. As a prototype, it was justifiable as a federal venture, since it would develop new techniques that had potential national significance. As a prediction response program in a particular place, it would actually help California, and thus be worthy of state funds.

With this notion in mind, Thiel and Lang began working to gather the necessary political backing at their respective governmental levels. FEMA Director Macy made known FEMA's interest during congressional

testimony, February 26, 1980. He said he hoped to have established in southern California, "A useful and productive alliance with state and local governments in preparing a prototypical earthquake prediction program."¹³ He felt this would help develop the "procedural tools and techniques" that could be "readily applicable in other large metropolitan areas in which earthquake predictions are likely."¹⁴

On March 7, Macy, at Vicencia's request, wrote him a letter elaborating on this testimony. Commenting on recent seismic anomalies, he warned that "it is possible that specific predictions could evolve from them within the next 12 months." While noting that an unpredicted earthquake was possible, the stress in the letter was on prediction. He proposed an alliance among FEMA, the state, and local California governments "in preparing a prototypical earthquake prediction program."¹⁵

On April 22, the Vicencia subcommittee held hearings, "Earthquake Prediction in Southern California." These were intergovernmental hearings, as federal, state, and local officials testified--all in favor of moving forward with earthquake prediction response planning. Issues of who would do what, how, for how much, were avoided. However, local government officials pointed out that if the federal and state government wanted local cooperation, local government would have to be involved from the outset. Vicencia, in fact, commended the representative from the City of Los Angeles "for

13

U.S. Congress, House of Representatives Committee on Science and Technology, Subcommittee on Science, Research, and Technology, February 26, 1980, p. 16.

14

Ibid.

15

Letter, John Macy, FEMA director, to Frank Vicencia, California Assembly, March 7, 1980.

getting into this long before we even got into it."¹⁶ The one view not made known at the hearings was that of Governor Brown, whose signature and support would be necessary if legislation were to pass.

Trigger for Action

On May 18, 1980, Mount St. Helens erupted, the greatest volcanic event the 48 contiguous states of the U.S. had experienced in the 20th century. Shortly thereafter, on May 21, President Carter flew over the area of devastation in the state of Washington. His science adviser, Frank Press, was with him, as was FEMA Director Macy. The president remarked at the extent of the destruction. Press pointed out that this was mild compared with what a great California earthquake would do.¹⁷

Search/Planning

On June 3, Carter officially asked Press to establish an ad hoc committee to examine more intensely the possibility of such a great earthquake, existing preparations for such an event, and possible additional federal actions that might be needed. Carter was sensitive to the fact that numerous national security installations were in California. For this and other reasons, Carter had the ad hoc study placed under the NSC. A number of agencies were asked to participate, including FEMA, Department of Interior, Department of Transportation, Office of Management and Budget, Defense Department, and others. From the outset, the focus was on the event,

16

California Assembly Subcommittee on Emergency Planning and Disaster Relief, Hearings, Earthquake Prediction in Southern California, Transcript.

17

Lee Dye, "Planning a Must: Is California Prepared for Big Quake?" Los Angeles Times, June 27, 1982, p. 1-1.

rather than prediction. And it was not just any event--it was the catastrophic event about which Press had apprised Carter in May.

Meanwhile, in California, planning was getting under way on the assumption that the cooperative program in earthquake prediction response would be established through federal and state legislation, effective early fall 1980. Because of legislative opposition to OES, and Alquist's support of SSC, the director of SSC, Robert Olson, had become de facto leader of the state planning effort.

On June 26-27, the first of what were to be a series of monthly meetings on what was called the "Earthquake Prediction Planning Project" was held in Los Angeles. Those who attended included top ranking representatives of Los Angeles, OES, state Division of Mines and Geology, SSC, the State Legislature, and both the federal and regional offices of FEMA. At this point, discussions were very general. However, it was decided that the geographical area to be included in the project be that which would be subject to the strongest shaking: this area would include parts of a five-county region. It would be centered around Los Angeles City, and include parts of Los Angeles, Orange, Riverside, Ventura, and San Bernardino Counties.¹⁸

In July, Olson and Lang went to Washington and held discussions with Thiel and Macy. "Over a handshake," they formalized the agreement on funding. FEMA would get the project started with \$300,000 out of existing funds. California would provide \$750,000 in the fall. FEMA, in fiscal year 1981, would expend another \$500,000. Thus, total project funding for approximately three years would be \$1,550,000.

Also, in July, Governor Brown asked William Whitson to begin looking at earthquake matters from Brown's perspective. Whitson was a private citizen who was helping Brown with his presidential campaign

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Meeting Summary, Earthquake Prediction Planning Project, June 26-27, 1980, Los Angeles.

against Carter for the Democratic nomination. Recently retired from a major research management position at the Library of Congress, Whitson was himself personally interested in the earthquake issue, and had been pressing the governor to give it greater attention. Sensing Carter preempting him on this issue, Brown gave it priority.

By the end of the month, therefore, the number of participants in California earthquake policy had expanded considerably. Most significantly, the "next great California earthquake" had the attention of top political levels in Washington, D.C., and the state. For Thiel, once a lonely voice in federal circles, there was now plenty of company. However, he remained particularly central to ongoing activities. He participated in the discussions Olson was having in California; and he was a dominant force at the staff level in the NSC work.

That work, to be sure, was proving important. It was causing the geologists both at USGS and California to reach an agreement on the state of the threat. That consensus was essentially confirming the work of CalTech's Kerry Sieh. In the mid-1970s, Sieh had discovered that along the south-central San Andreas fault, some 30 miles from Los Angeles, at least eight major earthquakes had occurred in the past 1200 years, with an average spacing in time of 145 years--plus or minus 30 years. The last great earthquake had occurred in 1857. Geologists working on the ad hoc study calculated, on the basis of Sieh's discovery and other geophysical observations, that "the probability for the recurrence of a similar earthquake is currently as large as 2 to 5 percent per year and greater than 50 percent in the next 30 years." Furthermore, there were other danger areas, such as San Francisco-Oakland, the immediate Los Angeles region, and even San Diego. "The aggregate probability for a catastrophic

earthquake in the whole of California in the next three decades is well in excess of 50 percent."¹⁹

In California, meanwhile, planning continued over the summer under the general direction of Olson. A planning committee (sometimes called the Interim Policy Advisory Board) had been established for the Earthquake Prediction Planning Project, as it was then known, and it met in Los Angeles on August 4.²⁰ The group's major concern at this point was organizational. That is, what was to be the structure of the project? The preference was that it be placed under a nonprofit corporation, to be formed specifically for this purpose. Such an entity would have flexibility in hiring and administration and would be somewhat removed from the jurisdictional squabbles likely if it were placed under an existing government agency. Articles of Incorporation were prepared by the County Council of San Bernardino County and presented at the August 4 meeting.²¹

It was noted, however, that it might take some time--perhaps six months--to get the necessary tax and other legal approvals for the

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Federal Emergency Management Agency, An Assessment of the Consequences and Preparations for a Catastrophic California Earthquake: Findings and Actions Taken (Washington, D.C.: USGPO, 1980), p. 3.

20

Members of this committee included: Charles Thiel, Terry Meade, John Sucich, Joe Dominguez, and Robert Stevens, FEMA; Ezunial Burts, L.A. City and L.A. County Emergency Preparedness Commission; Nancy Mattias, Deputy Director, California Office of Emergency Services; George Mader, William Spangle & Associates; Joe Lang, Assembly G. O. Committee; Rachel Gulliver Dunne, L.A. City Building Safety Board; Robert Rigney, Assistant County Administrative Officer of San Bernardino; Gilbert Smith, City of Carson; Priscilla Grew, director, and James Davis, Department of Conservation; Robert Olson and John MacLeod, Seismic Safety Commission.

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Minutes, Project Planning Committee, August 4, 1980, Los Angeles, California.

proposed organization. FEMA was ready to allocate the start-up \$300,000 now, and, in fact, had to spend this money by the end of its fiscal year, September 30, 1980. Also, FEMA and OES representatives were uncertain as to whether they could legitimately be appointed to a local corporation or authority. A variety of alternative mechanisms were considered, including funnelling the money through a local government agency, university, or existing nonprofit organization, such as the Red Cross or Southern California Association of Governments (SCAG). In the end, it was decided that the quickest way to establish it was under a state agency. OES was considered, but the deputy director of OES, Nancy Mattias, indicated OES would not be hospitable to such an innovative activity. Mattias was known to be at odds with the director of OES, Alex Cunningham. The fact that he had assigned her to the planning committee was viewed by some members of that committee as indicating his own lack of priority for the effort. Mattias, however, had very good relations with the legislature (although her agency did not). She was working with Lang on strategy to ease the passage of the necessary state legislation for a project, while also participating in the summer planning sessions. With OES having very little support within the planning group or with key legislative leaders, the only other place for it to go was SSC. Olson did not particularly want this project, nor did the Commissioners. Indeed, Olson saw problems for SSC, which had only recently won a survival struggle with the governor's office. As a small (\$300,000 per year) policy analytic organization, run by a group of part-time, essentially volunteer commissioners, SSC was not seeking large-scale action projects to manage. But the project had to go somewhere fast because of FEMA's spending deadline, and SSC seemed the logical place, especially in view of Olson's leadership in the summer planning effort.²² San Bernardino and local government representatives liked SSC. SSC was the only state commission that could match the wide area of powers of local government in the field of land use, planning, building and safety standards, and disaster response

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Ibid.

and recovery. It was a staff agency with only advisory powers vis-a-vis legislature and governor. It did not engender the fear that would have been engendered by a strong line organization that its recommendations could be forced at the local level, particularly in connection with land use planning. Olson saw this as a temporary expedient, however. His feeling was that eventually there would have to be a transfer of the project's products to an operating agency, probably OES. The more involved OES could be in the process producing those products, the better would be the ultimate transition in this view.

On August 20, in Sacramento, the planning committee met again and decisions were finalized. It was decided that this committee would be replaced by a permanent policy board once the project officially got under way. This policy board would act as a board of directors for the project. As such, it would select a manager for the project, develop the work program, and oversee administration. The policy board would be responsible to SSC, which would "retain ultimate responsibility for the project."

The group confirmed that the project area would be the broader five-county area, rather than just the Los Angeles area. San Bernardino, led by Rigney in the SCEPP planning, was most influential in establishing boundaries. It was careful to make sure the boundaries were not coterminous with some existing entity, such as SCAG or a regional unit of OES. None of the participating local governments wished to have their autonomy weakened. However, it was noted that there were "varying goals expressed by several factions involved in the creation of the project." One of the problems had to do with scope of the project, particularly the balance between prediction response and general disaster preparedness. There was some question as to how much should be expected of a small project.²³ At this point, however, there was no time to quibble about goals.

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Minutes, Earthquake Prediction Planning Project, August 20, 1980, Sacramento, California.

The state legislation was moving forward and the only question in California was: What would the governor do?

Adoption

On September 3, Brown's staff, including Whitson, and various state officials, received a briefing on the findings of the NSC study. The basic conclusion was that a great earthquake was increasingly probable, would cause extraordinary damage, and no government-- federal, state, or local--was prepared. The various levels of government would have to work together, since none had the resources or authorities alone.²⁴

On September 18, 1980, Press sent Carter a memo officially detailing the findings of the report and setting forth specific recommendations. The principal finding, said Press, was:

The Nation is essentially unprepared for the catastrophic earthquake in California which must be expected with a probability greater than 50 percent in the next three decades. Although current response plans and preparedness are generally adequate for moderate earthquakes, federal, state, and local officials agree that preparations are woefully inadequate to cope with the damage, casualties, and disruptions in communications and the governmental and civil infrastructure which will follow a major earthquake.²⁵

There were a number of recommendations, beginning with the need for Carter to "personally communicate with Governor Brown by letter to express your strong personal intent to work with the State of

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Briefing for Governor Edmund G. Brown, Jr., on the Findings of National Security Council Ad Hoc Committee on Assessment of Consequence and Preparation for a Major California Earthquake.

25

Memo to the president from Frank Press, "Assessment of Consequences and Preparations for a Major California Earthquake," September 18, 1980.

California and local governments in increasing the cooperative effort to prepare for a catastrophic earthquake." This was because "effective leadership at all political levels is the single most important factor needed to improve the nation's preparedness for a catastrophic earthquake in California." Also, included in the recommendations was a call for greater administrative leadership from FEMA, a particular goal Thiel wanted to have stated. The recommendations called for FEMA to establish "a small dedicated staff in California to concentrate on earthquake preparedness. . . ." The recommendation also called for FEMA to "work with state officials to develop improved mechanisms for the transmission of earthquake predictions and related information." The final recommendation was for FEMA to "reassess priorities and allocate resources to increase the staffing, funding and management attention focused on earthquake hazards mitigation and preparations for a catastrophic earthquake in California." Carter read the memo and wrote at the top right hand corner: "All recommendations seem to be OK. Proceed."²⁶

On September 19, Carter wrote Brown, thanking him for the assistance he and other state officials had provided the NSC study. While acknowledging that primary responsibility for preparedness rested with the state of California, its local governments and its people, Carter emphasized that "the magnitude of human suffering and loss of life that might occur and the importance of California to the rest of the nation require increased federal attention to this important issue." He went on to indicate his directive that "the federal government increase its work with you to supplement your efforts."²⁷

Brown obviously did not like being told by Carter that California was unprepared. On September 26, he wrote Carter that he had

26

Ibid.

27

Letter, President Carter to Governor Brown, September 19, 1980, cited in FEMA, An Assessment of the Consequences and Preparation for a Catastrophic California Earthquake, op cit., p. 39.

earlier (July 4) "raised the issue of seismic hazards" with Carter upon an occasion of their meeting. He pointed out that his various agencies had been doing much work in earthquake preparedness and, particularly, earthquake prediction. He welcomed Carter's interest and "personal reinforcement of our state and local efforts." As an indication of his own "personal interest in the subject," Brown said, he had "signed into law Frank Vicencia's AB 2202, a jointly funded state-federal project to design a comprehensive earthquake prediction-response plan."²⁸

The California legislation that Governor Brown signed in September 1980 adopted an earthquake prediction response program. It authorized the SSC to:

initiate, with the assistance and participation of other state, federal, and local government agencies, a comprehensive program to prepare the state for responding to a major earthquake prediction.

The program should be implemented in order to result in specific tools or products to be used by governments in responding to an earthquake prediction, such as educational materials for citizens. This program may be implemented on a prototypical basis in one area of the state affected by earthquake predictions, provided that it is useful for application in other areas of the state upon its completion.

Passage was expeditious in the legislature. The Assembly vote was 71-3; the Senate vote, 28-5. Similarly, relevant amendments to the Earthquake Hazards Reduction Act at the federal level sailed through. The legislation required FEMA to "develop a preparedness plan for response to earthquake predictions" In doing so, FEMA was "to include a prototype plan for one major metropolitan area which can be adapted to other high-risk metropolitan areas."

28

Letter, Governor Brown to President Carter, September 26, 1980, cited in FEMA, An Assessment of the Consequences and Preparations, op cit., pp. 41-42.

The legislation--state and federal--provided the necessary political sanction. It was sharply focused on prediction, in line with the original intent of Thiel and Lang. However, during the course of the summer, the NSC exercise had begun having an affect on the planning process in California, broadening the scope of the proposed project to reflect the new federal concern for the catastrophic event.

There was no single, major decision to enlarge the scope of the program. The project was still called the "Earthquake Prediction Planning Project." However, a shift in goals was gradually taking place. There was no great opposition to this change from Olson, Thiel, or Lang. The feeling was that measures taken to prepare for prediction would be equally relevant for an unpredicted event. Nevertheless, to the extent the project was viewed as a research and development/demonstration project, the broadening goals had the effect of blurring and enlarging the boundaries of what the new project was to do. This fact mattered a great deal to OES, already feeling threatened by the course of events. However, no additional resources were being provided for whatever extra work might be entailed, a fact that meant there would be limits as to how far the project could go beyond prediction response planning.

The broader mission that was adopted, informally, showed up more in the cooperative agreement between FEMA and SSC. This was worked out in September to permit FEMA to provide \$300,000 to California before the fiscal year ran out. With Olson out of the country at the time it was written, and with Terry Meade, a leading FEMA Region IX official, active in the writing, the heart of the agreement came down to a series of "project tasks." The very first task used the broader language: "Initiation by the Seismic Safety Commission of an earthquake preparedness work program for Southern California." There were 12 tasks in all, and these attempted to incorporate a variety of the interests and ideas that had evolved over the course of the summer. Prediction was indeed emphasized, and there was included, for purposes of knowledge transfer, a trip to Japan where prediction response planning was well ahead of the U.S. But a

reading of the tasks conveys the sense of a scope of work larger than that indicated by the formal legislation.²⁹ This was a consequence of the NSC exercise, and desire by FEMA (particularly the region) to prepare for the event itself, and not just the prediction of an event. Indeed, there was a feeling that the scientists' caution might mean there would be no prediction.

Also, there was another change. The federal legislation suggested an initial emphasis on Los Angeles. The shift to a "southern California" focus had also been subtle, evolutionary, and consensual. Scientists involved in the planning exercise suggested a five-county area as most vulnerable, not just the Los Angeles metropolitan area. With broadening, however, came new problems, for it was easier to conceive of an intergovernmental project involving three parties (federal, state, local/Los Angeles) than one where the local element consisted of a host of governments stretched over five counties from the Pacific to the mountains. Clearly, the realities of a catastrophic earthquake on the south-central San Andreas (the most likely event) required that the local partner in the project be a region; and one not necessarily with a history of intra-regional cooperation.

Again, if resources had increased along with scope and geography, perhaps the situation might not have been so potentially troublesome. But resource commitments had not so evolved. Oddly, no one talked about this matter too much at the outset. Perhaps this was because there was elation that a project of this kind had become a reality. There had never been anything like it before. The mood was to get the money for adoption, and worry about implementation later. After all, additional resources might yet come, assuming implementation went well.

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FEMA Assistance/Award/Amendment, Cooperative Agreement with California Seismic Safety Commission (SSC), September 26, 1980.

B. GETTING ORGANIZED

The Policy Advisory Board (PAB)

Even before the legislation was passed and a cooperative agreement between FEMA and SSC signed, Olson, and various others who had been on the planning committee, were assembling what was called the "Earthquake Safety Policy Advisory Board." Their aim was to represent on the Board various governmental, business and scientific interests in southern California concerned with the project.

The first meeting of the PAB was held September 18, 1980, still more than a week before the project was formally adopted by the State of California. Those members attending were: Larry Ammon, California Building Officials; Ezunial Burts, executive assistant to the mayor, Los Angeles; Ted Christensen, Structural Engineering Association; Alex Cunningham, director, OES;³⁰ James Davis, state geologist and chairman, CEPEC; Homer Givin, executive, IBM Corporation; James Haigwood, Red Cross; Cal McElwain, supervisor, San Bernardino County; Karen McNally, seismologist, CalTech; Evar Peterson, councilman, City of Westminster; Robert Wallace, geologist, USGS, Menlo Park; and Joan Wertz, representative of superintendent of schools, Los Angeles County. Burts acted as chairman, pending the decision on a permanent leader.

As the effort to assemble a policy board had begun early, so also was that to find a project director. Again, Olson had taken the lead, working with the interim committee constituted from the planning committee that had met over the summer. The job had been advertised in August and 30 applications had already been received and the screening process begun. It was decided that a committee made up of southern California members would select the top six candidates. It was clear that PAB's principal assignment at this

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Cunningham replaced Mattias once the PAB was established. Mattias eventually left OES.

time was to find the best person to manage the project, day-to-day. PAB would meet monthly.

When the PAB met again, on October 14, the southern California project was official. Governor Brown and President Carter had both given it their blessing, each claiming credit for the new initiative in California. Six new positions were authorized by Macy for earthquake planning in the FEMA regional office. Terry Meade, who had been active in the summer planning on behalf of FEMA Region IX, was placed on PAB.

Thiel and Lang--the "Founding Fathers"--attended and gave the members their perspective on the project. Thiel said that the project should be a federated effort with the state and federal governments in catalytic and support roles to local efforts. The product should be a program of response to a predicted or unpredicted catastrophic earthquake event. Lang emphasized the partnership approach to running the project and said that PAB should be the decision maker when it came to directing the program and its expenditures.

"Federated" effort and "partnershp" were indeed the words echoed by everyone involved at this point. However, there was already a bit of unrest among at least one of the partners. Robert Stevens, director of the FEMA Region IX office, in communicating with Macy, noted "some delays" in getting earthquake preparedness moving in view of PAB's "newness" and need for "thorough indoctrination" with respect to the "overall program." He also complained of delays due to PAB's "conservative approach" in evaluating some of the tasks to be performed, such as the trip to Japan.³¹

On November 7, PAB met again. There were additional new members present: Robert Gibson, a representative of southern California financial, insurance, and banking interests; Walter Johnson,

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Memo, Robert Stevens to John Macy, November 3, 1980.

Southern California Emergency Services Association; Robert Cheney, Seismic Safety Commissioner, and Eugene Zeller, superintendent of Building and Safety, City of Long Beach. Robert Olson was himself attending as a PAB member.

At this meeting, the PAB elected a permanent chairman, Homer Givin of IBM. An industrial scientist and executive, Givin had also long been a leading advocate within IBM for seismic planning. The fact that he was from industry and would aid the project in making public-private linkages, weighed in favor of Givin in the minds of many. Also, Givin, unlike Burts and others who might have been considered, was close to retirement, and was being permitted time by his company to devote to public service activity of this kind.

The selection of a chairman was the "good news" to come out of this meeting. The "bad news" was that the policy board's screening committee had not succeeded in agreeing on any candidate to be the project's director. Thus far, it found no one really qualified for such a unique position. The search would have to continue, with the hope of turning up better candidates. Meanwhile, it was announced that the first staff member of the project, hired as a special consultant under the state personnel rules, would be Rachel Gulliver Dunne. A geologist by training, Dunne had also been active in local government affairs. She had been the chairperson of the Task Force on Earthquake Prediction that had produced a "Consensus Report" for Mayor Bradley in 1978. She had also been a participant in the planning that had taken place over the summer. Well-trained technically, and well-connected governmentally in Los Angeles, Dunne regarded this project as a great opportunity professionally. Whether she would wind up the director remained to be seen. She was relatively young and the policy board very much wanted someone with "extensive management experience."³² Nevertheless, her joining the project was regarded uniformly as important and desirable.

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Minutes, Earthquake Safety Policy Advisory Board, Regular Meeting, November 7, 1980.

It was November, and the southern California project had a permanent chairperson for its PAB and its first professional staff member. The absence of a director remained a serious problem.

One of the reasons PAB was having so much trouble finding a director was that there was disagreement about what characteristics the director of the southern California project should have. Should he be an individual from the emergency planning community? Should he have local and/or state administrative experience? Would it be better if he were a private sector man? What about a woman? Dunne was regarded as a possibility, but not a strong one.

After coming up with nothing from the earlier search, PAB readvertised December 1. Meanwhile, in a state of extreme frustration, Givin decided to contact friends in industry to see if someone might be hired "on loan." An outstanding individual who was interested did surface. He was the vice-president of a southern California-based international company. He had a graduate degree in engineering from the University of California at Berkeley and was regarded as a very capable executive. Everyone on the search committee, as well as Olson of SSC, liked him.

However, when they tried to make him an offer, they found themselves stymied by California state personnel rules. He had other options and wanted a quick offer. The state personnel office was unable to respond, and he moved in another direction. Everyone was extremely disappointed.

The second advertisement had not yet turned up anyone remotely qualified, in Olson's view. As executive director of SSC, Olson was responsible to federal FEMA and was being pressed forcefully by an increasingly impatient Chuck Thiel in Washington. He had attempted to resume normal duties at SSC, following adoption of the project. He wanted PAB to take the lead in getting the project started. He did not wish to dictate policy to PAB and had fully anticipated PAB would find the appropriate director.

It had not worked out that way, and Olson was now almost desperate. He complained to his brother, a professor at the University of Redlands. The brother, Richard Olson, recommended, as a possible candidate, Carl Ledbetter, who had been his choice for the position of vice-president, academic affairs at the University of Redlands. Olson had been on a search committee that had recommended in favor of this person, but the committee's advice had not been followed by the president. Ledbetter was thus available. The academic Olson thought the individual was exceptional.

On December 24, Robert Olson called Ledbetter. Then executive assistant to the president at Sonoma State, Ledbetter was a 32-year-old educator and mathematician. In 1979, when he was appointed dean of academic planning at Sonoma State University, he was the youngest top-level executive in the 19-campus California State University system.

Ledbetter was mildly interested. On January 1, 1981, he had dinner with Haigwood of the PAB search committee, Givin and Olson. They were all extremely impressed with Ledbetter's good mind and self-assured manner. As one of those who interviewed him recalls, he was "charming, brilliant, witty." The next morning, they called him and gave him an offer. There were further negotiations, conversations, and approvals. Informally, Ledbetter started working part-time in mid-January, via an arrangement with the university. On February 5, he signed his contract with the state and became director of the southern California project.

Olson later recalled that he "bought a hiring process" when he selected Ledbetter. He was familiar with the extremely rigorous selection procedure through which Ledbetter had gone with Redlands. It seemed to him that such a process was as rigorous as any the state might have used.

Planning a Project Strategy

On January 12, 1981, Givin prepared a work plan for the effort. With a new director shortly to come on board, Givin felt it was time to develop, at least in broad terms, an operationalization of the main ideas implicit in the southern California project. PAB had been talking about what the entity might do. SSC Director Olson had made it clear that he preferred to have policy ideas come from the board and the project staff rather than to dictate policy from above. So Givin sat down and sketched out a sequence of steps the new director might consider in managing the day-to-day activities of the project.

As the overarching objective of the project, Givin wrote: "Develop and implement a transferrable, prototype, preparedness plan for a predicted or unpredicted catastrophic earthquake in southern California. Under "strategy," he listed the following approach:

1. Define generalized models/specifications/scenarios for plan components. . . .
2. Review and determine the status of existing earthquake plans of jurisdictional entities.
3. Find and establish partnership relations with appropriate entities in both private and public sectors.
4. With cooperative working partners, develop prototype component plans . . . for representative entities. . . .
5. Integrate independent partner plans into a SCP [Southern California Project] plan across all partners and jurisdictional levels.
6. Test, implement, improve, and maintain the comprehensive SCP plan.
7. Extend this process to other southern California entities through transfer of ideas, information, and prototypes or parts thereof, via education, participation, assistance and other appropriate persuasion.
8. Provide liaison to federal/state to facilitate extension of project to other metropolitan areas by transfer of planning process, ideas, information, and prototype parts as appropriate.

9. Terminate project.
 - Review Project
 - Evaluate results
 - Make recommendations to SSC/FEMA
 - Follow up as necessary.³³

This procedure was then given more specificity by his setting forth strategy and objectives for the first year--1981. He also discussed possible products, roles and responsibilities, and even the dependencies and risks faced by the project. Risks, for example, included "inadequate resources," "inadequate partners," "lack of cooperation by rest of southern California community," and "inadequate plan maintenance."

This document was provided to Ledbetter as he took command of the project. It was up to him to use it, ignore it, or build upon it.

On January 28, Ledbetter attended his first PAB meeting. There he heard himself formally endorsed by the board as the project director. He also witnessed board approval of Rachel Gulliver Dunne as acting deputy director. Ledbetter had a few items for which he sought board approval. Among those was the designation of an official name for the project. Up to this point, it was called either Southern California Project or Southern California Earthquake Prediction Preparedness Project (SCEPPP). The state leaned in favor of the prediction emphasis, while the federal government wanted a broader approach. Ledbetter and the board decided to go in the broader direction. They dropped prediction from the name, a change with much more than symbolic significance.³⁴

From the beginning, prediction had been the lead responsibility of the project. Even those long in the earthquake preparedness field had realized a weakness existed in the planning process where

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Draft, Southern California Earthquake Safety Advisory Board, Seismic Safety Project, January 12, 1981.

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Minutes, Earthquake Safety Policy Advisory Board, January 28, 1981, San Bernardino.

prediction and prediction response were concerned. But, as noted, after Mount St. Helens, Carter had brought preparedness for the catastrophic event to the fore as a priority, and FEMA had thus made it a priority for the southern California project. SSC and various others participating in the summer planning process had similarly moved in that direction. The Givin draft program plan had linked the two in the statement of the project's goal--developing and implementing a "preparedness plan for a predicted or unpredicted catastrophic earthquake." By taking "prediction" out of the southern California project's name, therefore, Ledbetter was taking the final step in moving from a specific prediction emphasis to a much wider-ranging preparedness mission. He was also giving himself more room to maneuver, since prediction could be considered only a part of preparedness. Preparedness was a broader term that could include much that existing agencies were already doing. Hence, the name itself had strategic significance, and Alex Cunningham, director of OES, regarded the name change as a threat to his agency's interests. There was a spirited discussion, and when it was over, on a vote of 9-yes; 3-no, "Southern California Earthquake Preparedness Project (SCEPP)" was made the official name of the project.³⁵

On February 9, a press release went out announcing the creation of SCEPP, with Ledbetter as director. The announcement was timed to coincide with the anniversary of the San Fernando quake. Ledbetter saw his role as having three facets: administration, program development, and public advocacy. Ledbetter deliberately, consciously, and--with full awareness of the potential danger to

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Ibid. Cunningham decided not long afterward that he would not attend PAB meetings. He had an alternate represent OES interests. The original notion (as espoused, at least, by Olson) of integrating OES into SCEPP policy making "at the front end" so that it would more easily transfer SCEPP products into its operational activities thus was blunted. From this point on, Cunningham saw SCEPP more as a rival than a potential helper. The two organizations largely went their separate ways.

himself--opted for the third emphasis. He did so strongly and visibly.

He began immediately. He spoke at the February 9 press conference at which SCEPP was announced, and at which Governor Brown also appeared. Ledbetter, articulate and confident, with his Ph.D. in mathematics giving him the aura of science, did well vis-a-vis Brown. Moreover, Ledbetter enjoyed being in the spotlight. His own natural skills and temperament combined well with his view of what needed to be done. What needed to be done, he felt, was to wake up the political and bureaucratic establishment of California to the reality of the catastrophic earthquake.

Thus, the February 9 exposure was followed by other public opportunities to get his message across. Shortly thereafter, on February 13, Ledbetter shared the platform with Congressman George Brown and Supervisor Cal McElwain at a conference in Colton, California. [Colton is a small town in San Bernardino County.] Ledbetter pointed out that there was a greater than 50 percent certainty that an earthquake would occur in southern California in the lifetime of people now living there. This could kill as many as 20,000, leave thousands with varying kinds of injuries, and turn large areas into shambles.³⁶

A catastrophic quake, Ledbetter said, would do damage 1000 times greater than the San Fernando quake of 1971, which took 65 lives and cost \$530 million. The greatest disaster from the quake would take place in San Bernardino, but neighboring areas, such as Redlands and Yucaipa, would not be far behind. Quoting the NSC/FEMA report, Ledbetter said this would be the "most devastating disaster to strike United States territory since the Civil War" and there would have to be cooperation between private industry, the public sector, neighborhood and all types of voluntary organizations. "Government," he declared, "cannot provide all the assistance that will be needed.

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Ted Randolph, "Disastrous Earthquake Predicted in Area," Redlands Daily Facts, February 13, 1981.

We must prepare on a house-by-house, neighborhood-by-neighborhood, workplace-by-workplace basis" for the quake that could exceed 8.3 magnitude on the Richter scale. Asked whether the predicted earthquake would be as devastating to an area as a nuclear attack, Ledbetter answered in the affirmative.³⁷ Ledbetter gave an effective and somewhat frightening presentation. He meant it to be both, and he would give it often to a variety of groups in the months to come.

Ledbetter preferred the outside role, but he had to give some attention to inside matters. These included program development and routine administration. He had also to worry about a competent staff. He began with Dunne as his deputy. This did not work out at all, and she soon found herself relegated to a lesser role. In her place, in fact, if not in name, was Richard Andrews. He was among the first professionals Ledbetter hired. On leave from the chairmanship of the History Department, University of Redlands, Andrews was a former professor of Ledbetter's, when Ledbetter was an undergraduate at Redlands. Andrews had been on the search committee that had recommended Ledbetter for a top administrative post at Redlands. Although 10 years Ledbetter's senior, Andrews got along well with Ledbetter. Moreover, they lived near one another, and every day drove the two and one-half hours it took to go from San Bernardino to the SCEPP office in Van Nuys, and back again in the evening. Ledbetter delegated much of the day-to-day administration of the project to Andrews, including recruitment of additional staff.

Particularly critical in program development at the outset was Dennis Mileti, a sociologist on leave from Colorado State University. Mileti was deeply interested in the subject of earthquake prediction. He was principal author of a book, Earthquake

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Ibid.

Prediction Response and Options for Public Policy,³⁸ that was scheduled for publication later that year. Miletì had taken a year's assignment with the SSC, in part to help translate some of his theory into practice. Olson, in turn, made Miletì available, half-time, to SCEPP.

Ledbetter, Andrews, Miletì, and, to a lesser extent, Dunne, were drawn into initial program planning sessions. Ledbetter had the draft plan provided him by Givin. Ledbetter liked the planning partnership notion, and decided to develop it further. The "partnership" implied a relationship of equals, but SCEPP had a task to transfer new knowledge about prediction and preparedness for a great earthquake to a host of users. What would be transferred? How could this knowledge be aggregated and "packaged"? On February 19 and 20, the four individuals discussed this problem.

Out of their conversations came a framework for relating various concepts in disaster planning. Many of these came directly from Miletì's academic work. Miletì wrote down various concepts and connected them visually, on the blackboard, before Ledbetter and the others. Ledbetter remarked that they reminded him of a tableau (i.e., a vivid and graphic description). For mathematician Ledbetter and sociologist Miletì, the tableau was the key to the question of knowledge transfer from SCEPP to its planning partners. It was, moreover, an innovation in disaster planning "technology." There was a sense of creative excitement at SCEPP. With Miletì taking the lead, Ledbetter, Andrews, and Dunne continued to discuss the tableau as a way to synthesize, in one place, a planning methodology that would be theoretically sound and operationally useful.

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Dennis S. Miletì, Earthquake Prediction Response and Options for Public Policy (Boulder, CO: University of Colorado, 1981).

On February 25, at the monthly meeting of the PAB, Ledbetter discussed his preliminary work plan. As reported in the minutes of the meeting, Ledbetter told the group:

The principal instrument for the planning efforts will be the Mitigation-Preparedness Tableau (MPT) developed by the project staff, which will be used to generate complete, flexible, adaptable, and coordinated plans with action flow-charts, policy indications and selection mechanisms, prediction configuration considerations, and adjustment procedures for the multitude of hazard reduction and preparedness activities conducted by the various entities involved in the planning effort.³⁹

The PAB was somewhat taken aback by the tableau. Members asked for more information and Ledbetter said staff members were working on amplifying various sections. In March, this was done, with particular emphasis on prediction. Mileti was especially interested in this latter aspect. Ledbetter, initially, had not given prediction much thought, preferring the more inclusive term, preparedness. But he came to see prediction as critical to SCEPP and to the tableau. Prediction would be a method of altering the level of preparedness. It would provide a forcing function. Different actions would follow from different types of prediction: long term, intermediate, and short term.

From a purely conceptual point of view, the tableau was exciting and important. Ledbetter and his staff developed visual aides to help convey the ingredients in the tableau and how they came together. On March 4, Ledbetter testified before the U.S. House of Representatives Subcommittee on Science, Research, and Technology, where he spoke enthusiastically of the MPT as "the central planning instrument for SCEPP and its planning partners." As he declared:

Any entity targeted for earthquake planning can be subjected to a series of questions that, if

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Minutes, SCEPP Policy Advisory Board, February 25, 1981.

answered, would profile what should be addressed in planning. These questions include: (1) What can be used to mitigate and prepare? (2) How much toward these goals has been accomplished? (3) What else needs to be done? (4) What resources are available, and which tactics are best used to do more? (5) How can continuity and durability of plans be maintained? (6) What policies should be adopted to select planning modules already constructed? The project has sought to standardize how these questions and answers to them will be used. This standardization, through the development of Mitigation-Preparedness Tableau (MPT), will induce planning compatibility and comprehensiveness across all planning units; it will also facilitate educating project participants to the full range of planning activities that could and should be undertaken for effective earthquake hazard mitigation and preparedness.⁴⁰

Thus, early on, SCEPP had what might be called a plan of action for technology transfer. One feature was the partnership concept-- stressing equality between SCEPP and various jurisdictions. The other was the tableau, the planning technology SCEPP would try to get its partners to accept as the one best way to go in preparing for the next great California earthquake.

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Carl S. Ledbetter, Testimony, before House of Representatives, Subcommittee on Science, Research, and Technology of the Science and Technology Committee, March 4, 1981.

C. A TIME OF CRISIS

Success and Failure at Partnership

While further refining the tableau, staffing SCEPP, and bringing a new visibility to the earthquake issue via numerous speaking engagements, Carl Ledbetter also took the first steps towards engaging planning partners. From the time he came aboard, it was taken for granted that SCEPP had to work first and foremost with Los Angeles. It was not just important because it had an earthquake hazard and was the largest city of southern California. It was important also because FEMA said it was critical. The contract between FEMA and California seemed to make partnership with Los Angeles the top priority for SCEPP by calling for SCEPP to deliver to FEMA, by September 30, 1981, "a Los Angeles Metropolitan Area [earthquake prediction] Response Plan."⁴¹

Ledbetter, however, decided that San Bernardino County should have at least equal priority. This was in large part because Robert Rigney, chief administrative officer of the county and a senior member of SSC, who had been involved in the planning of SCEPP from the beginning, pressed for San Bernardino's equal priority. Also, it was because San Bernardino was much closer to the San Andreas. The actual threat of devastation from a catastrophic quake was greatest there. It was also because Ledbetter lived in San Bernardino County, knew the area, felt he could make immediate progress, and that a show of quick success was critical for SCEPP's reputation. Finally, he believed Los Angeles would be a difficult arena in which to work, due to its sheer size and complexity. In staff discussions, other potential planning partners, aside from Los Angeles and San Bernardino, were mentioned, but these two jurisdictions were the focal points of early efforts by SCEPP to develop linkages with local southern California entities.

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FEMA/SSC, Cooperative Agreement, September 26, 1980.

Ledbetter was correct in his view concerning San Bernardino and Los Angeles, although in the latter case, painfully so. San Bernardino was indeed ready, willing, and anxious to work with SCEPP. George Brown, the congressman who had sponsored the Earthquake Hazards Reduction Act of 1977, represented this area. The vice-chairman of PAB was Cal McElwain, a member of San Bernardino's Board of Supervisors. The county's chief administrator, Robert Rigney, was a long-term member of the SSC and had been active in the summer planning effort for SCEPP. They were all aware of the fact that they had a severe earthquake problem, and that while they had engaged in some preparedness actions, there was much more to do in view of the threat. There was irritation with Ledbetter's public speaking, the way he gained attention by alarming the local public, and his lack of acknowledgement of the past contributions made by local officialdom. But they all knew that SCEPP represented an opportunity to help get action in San Bernardino in needed ways.

With such strong political backing from the outset, emergency management officials in San Bernardino had to listen to what Ledbetter, Andrews, and other SCEPP staff had to say in the initial meetings that took place in March 1981. They may not have been comfortable with the tableau, but the view was that San Bernardino would be a planning partner for SCEPP. It was merely a question of working out the details.

By late March, a draft planning partnership Memorandum of Understanding (MOU) was prepared by SCEPP and San Bernardino. This memo, while vague, was sufficient as a basis for getting started. It called upon SCEPP to provide certain services. These services would include:

1. Development of an earthquake prediction/warning system and policies.
2. Assessment of earthquake vulnerability arising from geological and seismic conditions, hazardous structures and lifelines.

3. Workshops and in-service training sessions for Planning Partners.
4. Educational and public information efforts to promote public understanding of the earthquake threat and the meaning of predictions.
5. Development of mitigation-preparedness plans for specific sites within the county.
6. Integration of preparedness plans into a county-wide plan.
7. Preparation of reports and plans necessary to the planning process.

For its part, the County of San Bernardino would provide:

in-kind services, including meeting space for Task Force sessions, representatives from relevant and appropriate agencies to serve as Task Force members, relevant data and information such as existing earthquake preparedness and disaster response plans, assessments of local building inventories and other information useful in developing earthquake hazards reduction planning, and such additional assistance as requested by the Project Director, the Policy Advisory Board, the County of San Bernardino Board of Supervisors or the Coordinating Task Force, consistent with available resources.

The County of San Bernardino agrees to work with SCEPP staff, private industry, cities within the County, school districts, volunteer organizations, and neighborhood groups in promoting earthquake hazard reduction and preparedness as important matters of public policy, and to encourage jurisdictions within the County to support Planning Partner efforts.

The MOU read that it was anticipated that comprehensive, integrated earthquake hazard reduction plans would be completed under this work-sharing agreement approximately 18-24 months following the inauguration of the planning partner effort.⁴²

On March 25, the proposed MOU was approved by SCEPP's PAB. With Rigney and McElwain's strong endorsement, San Bernardino's Board of

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SCEPP/San Bernardino, Memorandum of Understanding, April 6, 1981.

Supervisors gave its approval to the memo on April 6. One planning partnership was thus adopted, with a minimum of trouble.

The situation in Los Angeles was quite another matter. To begin with, San Bernardino's political leadership recognized a need and saw SCEPP as an opportunity. SCEPP and the county could write on a relatively clean slate. There was a new individual in charge of the emergency function of county government and he was not about to buck the political leadership. Early meetings between SCEPP and county political and administrative officials were not necessarily without tensions, but the prevailing attitude was positive.

In Los Angeles, the situation was quite different. Los Angeles, it will be recalled, had produced its Consensus Report of the Task Force on Earthquake Prediction in October 1978. It had not moved far in following-up on this report, however. This was not due to a falling off of interest on the part of Mayor Bradley or Burts. Burts was, in fact, a participant in the summer 1980 planning sessions that had led to the organization of SCEPP, and he was a member of the PAB. However, some of the momentum had slipped when the mayor's office put the project on hold. Although much of the work had been completed, an anticipated \$75,000 in additional resources to work on the project did not materialize. Further, two of the "working level" principals behind the Los Angeles prediction effort had changed assignments. Dunne, who had spearheaded the task report, had gone to SCEPP. Commander Jesse Brewer of the Los Angeles Police Department, who had headed an interagency committee assigned to develop a prediction response plan based on the consensus report, had moved to another assignment and been replaced by Commander George Morrison. Morrison was already heavily engaged in other matters (such as heading the Los Angeles "SWAT" team).

Moreover, Los Angeles had many other priorities and problems, including lost revenues due to Proposition 13. It had supported the passage of the Earthquake Hazards Reduction Act in the expectation that that act would yield dollars for Los Angeles to complete what it had started in earthquake prediction and make other improvements

in preparedness. That expectation had not been borne out. Instead, there was SCEPP. From the standpoint of some Los Angeles officials, it was up to SCEPP to prove it could do the city some good.

It was in March, when SCEPP was negotiating successfully with San Bernardino, that Ledbetter sought to initiate a dialogue with Los Angeles. Burts, at Ledbetter's request, set up a meeting for March 12, late on a Friday afternoon. Burts invited, on short notice, three individuals whose support he deemed essential to establishing an actual partnership. These were: Shirley Mattingly, the principal budget official responsible for agencies concerned with emergencies (such as police, fire, public works, etc.); Commander Morrison, who had both Brewer's planning responsibility and a potential response role should any quake occur; and Edna Bruce, a key city council staff person.

It is not clear that the Los Angeles people had any conception of what the meeting was intended to accomplish. Perhaps it was that SCEPP would share its financial resources with Los Angeles. Perhaps it was that SCEPP would help the city complete the prediction planning effort it had already started with the consensus report. The person who was a point of continuity between that effort and SCEPP--Dunne--was at this meeting, but did not play a large role. The point is that whatever the Los Angeles officials might have wanted to hear, they did not hear it. There was apparently no attempt prior to the meeting by either side to get a sensitivity to the other. Each went in "cold." As a result, what took place was a presentation by Ledbetter of the tableau, a presentation that alienated the three local officials Burts had asked to attend, and greatly disappointed Burts. As the Los Angeles side saw it, their city had been in the business of earthquake preparedness some time. The impression conveyed by Ledbetter was that of a brash amateur lecturing senior administrative people that his way was the best way. They saw a young man with a theoretical and complex approach. They heard about prediction and preparedness, but did not see where what they heard helped them. They listened and had one basic question: What's in it for Los Angeles? Ledbetter had made it

clear that he anticipated an entirely new set of earthquake preparedness plans. What made this expectation especially distasteful was that the Los Angeles people did not hear evidence to suggest that SCEPP had read the existing plans. Further, like so many others, Los Angeles was apprehensive about the whole notion of prediction which Ledbetter so ardently stressed.

After the meeting was over, and Ledbetter had left, those who attended asked Burts, in effect: "Do we really have to do this?" Burts himself had been turned off by the way the meeting had gone. He was a SCEPP supporter, but did not like the tableau. Initially, he had thought there was something wrong with himself, in not understanding the particular planning tool Ledbetter was pushing. Now, he decided it was the tool that was at fault. He decided there would have to be a great deal of repair work to make up for what he regarded as a "disastrous" meeting. He decided not to try to ram SCEPP down the throats of the Los Angeles officials. In his view, the memo would be meaningless without their support. His interest (and the mayor's) was in institutionalizing whatever came out of the SCEPP process with Los Angeles. He knew from experience that unless the career administrators were sold on an innovation, it might be adopted by politicians but would never be fully used by the bureaucracy.

He indicated to the officials that the mayor and he were committed to trying to work with SCEPP, and efforts to reach an accommodation would continue. Burts also conveyed to SCEPP and PAB his reading of the negative reaction. Burts found himself in the odd position of having a foot in both camps--being a member of PAB as well as a Los Angeles policymaker. He recognized a large problem ahead in playing a broker role. As of March 1981, that role would be a difficult one, but he made it clear both to SCEPP and Los Angeles that he would try to keep them in contact, but it would be largely up to them to see if a partnership would be possible.

Within SCEPP, however, there was disagreement as to whether the problem lay with SCEPP or Los Angeles. Ledbetter was aware the

meeting had gone poorly, but he also believed that the tableau was "right," and that Los Angeles needed to be brought around to this view. If Los Angeles wanted to resist working with SCEPP, Ledbetter told his SCEPP associates, then SCEPP could live without Los Angeles. There were many, many other jurisdictions in southern California. San Bernardino was in hand. Givin, chairman of PAB, though disappointed, was supportive of Ledbetter, and tended to feel the problem was with the city. Members of Ledbetter's staff went along, but disagreed with their leader about the importance of Los Angeles to the project. The dominant mood within SCEPP and PAB was that SCEPP had suffered a serious setback, but, as long as Burts was there, an eventual solution would be found. It was obvious to all, however, that establishing a planning partnership with Los Angeles would take far more time to consummate than originally expected.

The Firing of Carl Ledbetter

If SCEPP was running into problems with Los Angeles, it was also having difficulties with California state government. The relationship from the outset had been somewhat rocky. For the most part, this was due to SCEPP's annoyance with the fact that SSC had apparently done little to prepare the way for SCEPP with the state personnel board and financial office. Givin was under the strong impression that Olson had said SSC would do so. But he felt it had not. Since Ledbetter himself had other priorities, there was a great deal of paperwork the state demanded and SCEPP was either unable or unwilling to supply. The early SCEPP recruits--academic or academically-oriented--had no experience in dealing with state government. Givin and Ledbetter found it necessary to resort to desk-pounding and raised voices with state personnel and financial officials to get any progress at all.

In March, Ledbetter hired Rusty Gagnon, an individual who had worked previously with state government, and was reasonably familiar with the ways of bureaucracy. Gagnon moved quickly to do what had not yet been done to satisfy Sacramento. Because SCEPP had not gone through all the necessary procedures to get established as a state

organization, state personnel and financial offices had not permitted payment of bills, including rent and salaries. The situation was extreme. Dunne, for example, had not been paid since coming to work in November 1980. SCEPP had been served with an eviction notice from its offices. Gagnon worked late hours to get the necessary paperwork done. This included coming up with a management and personnel organization plan, replete with position classifications, duties, and budgets.

SCEPP became more irritated with what it perceived to be the lack of help from SSC, primarily Olson, its director. And Olson, for his part, saw SCEPP, primarily Ledbetter, as simply being stubborn about making peace with the "system" that was state government. Olson believed he was helping, and so was Joe Lang. They pressed the bureaucracy. But they found that SCEPP had offended the personnel and financial operatives, and this made their job of helping the fledgling organization get "legitimated" all the greater.

SCEPP and "the state", therefore, were off to a shaky start on issues that had nothing to do with the substance of earthquake preparedness. And while SSC was not the problem (this being the state personnel and financial offices) SSC was implicated as part of the problem by SCEPP, as SCEPP was seen as part of the problem by SSC. The atmosphere was inevitably soured, and both sides saw incompetence in the other.

Fortunately--or unfortunately--the PAB served as a buffer between SCEPP and SSC. Olson and Ledbetter did not speak that much or with the total frankness that might have been desirable, in retrospect. Ledbetter saw PAB, and particularly Givin, in his immediate chain of command. Olson did not discourage this view. He was quite busy on a variety of other SSC activities. He wanted SCEPP and PAB to set the pace and direction of the project, within the overall parameters set by the FEMA/SSC agreement. His administrative style was relatively relaxed and informal. As long as there were no problems and the job was getting done, he saw his and the Commission's role as one that was more collegial than hierarchical. He encouraged a

sense of autonomy in PAB and SCEPP. But by April, Olson decided that he could not stay aloof from the happenings--and non-happenings--in southern California.

He was aware of the Los Angeles matter, as well as FEMA's growing unhappiness with the slow pace. SSC was responsible to FEMA for SCEPP's performance. SSC was also responsible to the state legislature which funded the project. Olson and various members of the SSC were growing a bit worried about their apparent lack of control over what SCEPP was doing. There were signals coming back to Olson from important local officials who did not like Ledbetter's style of scaring people into a state of awareness. These officials had to live with the earthquake problem and felt that they were doing their best, and that Ledbetter's talks were not always constructive. Nor did they get adequate recognition for what they had done from this "newcomer." There were rumors that Ledbetter might be using the earthquake platform to further his own political ambitions.

Olson, who anticipated problems with the legislature and FEMA unless SCEPP moved more quickly and successfully, listened to the negative signals. He decided that they were getting sufficiently strong that he should seek to tighten SSC's reign on SCEPP.

On April 9, Ledbetter appeared before the SSC to brief the commissioners on SCEPP's activities. Ledbetter's presentation was focused on the tableau. Bruce Bolt, director of the Seismological Laboratory at the University of California at Berkeley, found the presentation filled with jargon and unnecessarily pretentious. Other SSC members did also, but Bolt made his views known, saying something uncomplimentary about "soft scientists." Ledbetter was offended, and quickly pointed out that he, a mathematician, was a "hard scientist" himself. This exchange did not endear Ledbetter to Bolt or other commissioners. Nor did it help his case with Olson, who was worried that Ledbetter lacked a certain political sensitivity in dealing with men who had standing in the earthquake field.

Meanwhile, federal FEMA, in the person of Chuck Thiel, decided it would have to assert itself. It worried that it would not get its first "deliverable" from the California contract, namely, the prototype earthquake prediction response plan for the Los Angeles metropolitan area. In early May, Thiel came out to California. There was a meeting among Givin, Ledbetter, Andrews, and Thiel, May 12, at the home of Terry Meade, the principal FEMA regional official concerned, in Sacramento. Givin and Ledbetter were warned by Thiel that if they did not get on with the Los Angeles partnership and produce the prototype prediction response plan by September, FEMA would withdraw its money. Givin stood up, and said to Ledbetter: "Come on Carl, it looks as though the project has come to an end." Thiel backed off, said he was just kidding, and the discussion resumed.

SSC, however, had also been informed of FEMA's concern. On May 14, it appointed a committee to review the progress of SCEPP and the process of communication between the project and SSC. Commissioners Burts,⁴³ Cheney, Scott, and Olson were appointed to the committee. At the same time, Olson decided to resign as an alternate for Commissioner Cheney and act in an "ex officio" capacity on the SCEPP board. He wanted to concentrate on his role of executive director supervising the project--and perhaps put some distance between himself and SCEPP.

On May 28, the SSC review committee met with SCEPP to assess the status of the project, and discuss means to maintain better communications in the future. Olson, by this time, was persuaded that Ledbetter was the basic problem, and that something had to be done quickly to get the project back on track, before it was too late.

On June 8, Olson visited SCEPP and interviewed the various staff members. Two days later, a meeting of the executive committee of SSC took place. Present were Olson, George Mader the SSC chairman,

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Eze Burts was a member of SSC as well as PAB.

and Stan Scott. On June 11, Givin and Ledbetter attended an SSC meeting and reported on SCEPP objectives, expected products, approach, management responsibilities, and related topics. After the meeting, an executive session of SSC was held. Olson presented a picture of a project that was quite different from that presented earlier in the day. The view Olson provided was of a project in disarray, lacking clear goals and firm leadership, one in which there was internal bickering and frustration. He recommended that Ledbetter be terminated. The SSC executive committee agreed.

On June 12, Olson called Ledbetter and said he wanted to come down to the SCEPP offices, and speak with him. "Are you coming down to fire me?" asked Ledbetter. Olson replied, "Yes." This event occurred on a Friday. Over the weekend, the telephone lines between Sacramento and southern California, and between Washington and both parts of California, were quite active. The decision had been made and "delivered" prior to informing either FEMA or the SCEPP PAB. Thiel and Meade were angry about the process. Givin was furious about both the process and the substance of the decision. Ironically, some of the SCEPP staff--including Ledbetter and Andrews--were at a previously scheduled party over the weekend. The party had the atmosphere of a wake--a wake for SCEPP.

Aftermath

On Monday, June 15, 1981, Olson went to SCEPP and spoke with the staff. He placed Richard Andrews in charge on an acting basis. Ledbetter had asked Andrews to stay. As a professor on leave, in June, Andrews had no way of going back on the university payroll, and was not at all sure he wanted to in any event. He was now caught up in the excitement of SCEPP and its goals. But there was no surety about his future beyond the summer. He did not know what Olson really thought about him. Neither did Olson at this point. Olson had considered terminating Andrews and Gagnon along with Ledbetter. He had talked with Terry Meade of FEMA Region IX who advised otherwise. It was Olson's decision and he decided not to, lest the whole project collapse. Olson spoke with various members

of the staff, all of whom indicated a desire to stay. He made it clear that the state and federal governments continued to support SCEPP and wanted it to succeed. But everyone knew SCEPP was literally on trial in the summer, 1981.⁴⁴

There was also a continuing acrimony. Ledbetter was attributing the firing to his outside advocacy and the fact that he made certain "political and financial interests" angry. "I was fired for making the issue too prominent," he later wrote. "We were making sure the threat was well known, well understood--and the threat made them very nervous. What I'm saying is that they don't want it talked about out loud." George Mader, chairman of SSC, responded to this published charge with the defense that Ledbetter was incorrect. He declared: "The objective of the project is to make the earthquake threat prominent and to assist southern California in developing ways to reduce the potential impact of a major earthquake. Ledbetter left the project for reasons relating only to project management and administration."⁴⁵

It was, to put it mildly, a difficult time for everyone concerned, and there were many bruised egos. In the midst of turmoil, a critical meeting of federal, state, and SCEPP people took place on June 23, at SCEPP's offices. Thiel, Meade, Olson, Givin, Andrews and various SCEPP staff were present. They agreed to put their immediate differences aside in the face of the very real threat that SCEPP would fall apart unless they cooperated to make it work. At this meeting, it was agreed among the parties that:

The general goal of SCEPP is to change the preparedness and mitigation status of institutions in southern California by working with planning partners in a cooperative effort. This

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There was some sentiment within SSC for removing Givin, but this was kept in check.

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Ledbetter's comment is in Jonathan Kirsch, "Confessions of a Seismophobe," New West, August 1981, pp. 75-77; Mader's appears as a letter to editor, New West, October 1981, p. 12.

is a developmental undertaking in that the changes will be continuous and ongoing. The value of the project will be based on what it leaves for future use.⁴⁶

A number of understandings were reached with respect to San Bernardino, the one partnership that seemed to be promising (but which had not gone very far beyond the MOU). An agreement was stated in writing that "We hope to develop a county plan which would outline procedures for response to predictions, to an earthquake itself, and for recovery from an event." In addition, "a separate program component which is not necessarily tied to the county plan is a regional education program which would be concerned with the schools with special focus on bilingual education. The third element is a planned improvement cycle, or incremental improvement plan which would establish mechanisms for refinement and improvement of the plan prepared."

It went on to indicate the expectation that:

there will be wide county representation in planning groups. By this, we mean that all groups within the county and all political and economic forces will be represented and will participate in the planning process.

For SCEPP's part, there was a need "to provide San Bernardino with one SCEPP staff director for the technical work of the project." It was stated that Paul Flores, who had recently joined SCEPP, would fill that role.

It was agreed that "the project director is the political focal point of the project and will attempt to work with local political entities so that the partnership will be efficient and effective. Any policy or political questions should be directed to the SCEPP director.

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Minutes, June 23, 1981.

It was agreed that SCEPP would have "to issue a regular flow of products."

SCEPP would "not change regional boundaries" but would "work toward a consistent response plan within those established." The group was aware of "the need for a regional management strategy for an earthquake prediction and response system."⁴⁷

A number of other matters were discussed, including the need for a model large city plan based on work with Los Angeles. But the emphasis was on finding points of agreement, and pinning down what SCEPP should do where it had a willing partner, San Bernardino. That the meeting was substantive, constructive and forward looking was important; so was the fact that key intergovernmental participants in the SCEPP policy process were present.

On June 24, the first meeting of the PAB took place following the firing. There was a regular meeting and a closed, executive meeting. The regular meeting focused on the present and future work of SCEPP. It featured a briefing by San Bernardino's Howard Littlefield. Littlefield, director of the General Services Administration, was a senior civil servant who had a strong reputation for "getting things done." His appointment to lead the county's side of the partnership effort was a sign that Rigney, the county executive, was determined that there be some accomplishments down the line. Rigney had personally and privately lectured Andrews that SCEPP, thus far, had not done San Bernardino much good. Littlefield's briefing described the ongoing emergency planning in San Bernardino and the county's expectations as to what help SCEPP could provide. The briefing set an "upbeat" note.

So also did a report from Paul Somerville, of the consulting firm Woodward-Clyde. Somerville had been in Japan and indicated arrangements for a SCEPP Study Team to go to that country to study how a

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Ibid.

"model" earthquake prediction/preparedness system worked were coming along. This trip was an item in the original contract, one FEMA (Thiel) regarded as important to transferring state-of-the-art preparedness technology from Japan to the United States. The Somerville presentation also was a positive moment.

Later, the executive session took place, and the firing of Carl Ledbetter was discussed. Givin's anger remained, and he directed that anger at Olson, who attempted to state his position before the board. Olson was conciliatory and indicated he was sorry about the way the matter was handled--namely, not informing the board prior to the event. He reported that Ledbetter had gotten the decision out of him over the phone, and that had not been the intent. However, Olson defended the decision as correct, and necessary for the survival of the project. Henry Reining, a PAB member and former dean of the University of Southern California School of Public Administration, was not satisfied with Olson's explanation. Nor was Givin. Feelings were strong, and Givin did not hesitate to tell Olson, forcefully, what he thought of the manner in which he had acted. In the heated discussion that followed, it became clear that opinion within PAB was divided. Burts and Cheney, for example, supported the decision, if not necessarily Olson's handling of the decision. A motion to censure SSC was raised. One who was particularly influential in defeating that motion was the state geologist, James Davis.

Davis, well respected and regarded as one with no particular axe to grind on the Ledbetter matter, said he too was appalled by the way the termination was handled. However, the problem of the great earthquake remained, and it needed to be addressed. He felt the various participants should work toward better communication in the future, and get on with the job of preparing California for what was coming. Davis' remarks had a calming effect. The censure resolution was not passed.

Two motions were made and carried by the PAB. These were:

1. That a letter of appreciation and commendation be sent immediately to Dr. Carl Ledbetter, former director of SCEPP, on behalf of the PAB to recognize his leadership and contribution as director; and that the unanimity of the vote shall be reflected therein. Dean Reining agreed to assist the chairman in drafting this letter.

2. That the PAB request a joint meeting of the executive committees of the PAB and the SSC, expanded as appropriate, to develop immediately protocol, policy and procedures outlining the mission of the PAB and its relation to the SSC.⁴⁸

The meeting was over, but scars remained.

SCEPP Survives

The firing of Carl Ledbetter was a wrenching experience for all concerned and could have destroyed SCEPP. In June 1981, there was no guarantee that SCEPP would survive the summer. On the other hand, the firing brought to the surface basic issues whose resolution was essential to survival. Basic relationships among the parties to SCEPP were discussed frankly, including issues of scope and control. The California Seismic Safety Commission was indeed in charge, as the dismissal, made without advice and consent of either PAB or FEMA, made abundantly clear. However, SCEPP could only succeed if SSC, FEMA, and PAB united in a cohesive manner around the project and gave the project director full support. Meetings took place in June, July, and August that resulted in a rewriting of the FEMA-SSC cooperative agreement, and a variety of formal and informal understandings related to roles and decision making. FEMA dropped the September 1981 deadline for a prediction plan for the Los Angeles area. Everyone looked for ways to help. There was little choice: either the parties worked together, or they would fail together. Time was running out.

The acting director, Richard Andrews, was the beneficiary of the new spirit of intergovernmental cooperation. Andrews realized that he

had to give considerable time to fence-mending. His personality was such that he was well equipped for that diplomatic task. He made the very most of the new political environment in which SCEPP found itself. Andrews had been, to all intents and purposes, the deputy director under Ledbetter. He fully understood the project and its problems. While articulate and able to maintain a heavy schedule of talks on the earthquake threat, Andrews was much more patient with inside management tasks as well as the need to build internal cohesion as organizational strength for program success. He regarded the opportunity to lead SCEPP as an important one and quickly consolidated his position. Thiel told him: "You've got the horse; now ride it." In riding the horse, he had an advantage Ledbetter did not have: more staff to help him. A number of new positions, secured from the state under Ledbetter, were filled in the summer of 1981.

Most of the staff were hired on an ad hoc basis, in the sense that individuals brought in individuals they knew. "Good people" were hired, rather than specialists for particular positions.

Perhaps the most important addition was Paul Flores. In his early 30's, Flores was already established as a professional disaster planner. He had worked with local government and understood the local government perspective. In addition, he involved himself deeply in the San Bernardino partnership so as to implement quickly the June 23 agreement. As new people came aboard in the summer, Andrews reorganized his staff. He elevated Flores to deputy status, and reduced Gagnon's role. He reached agreement with Dunne that it was better for all concerned if she left. SSC, PAB, and FEMA were supportive as Andrews made these decisions. The fact that he made decisions was regarded as evidence that he was "strong." For his part, Andrews was making personnel moves he felt had to be made to get SCEPP off to a fresh start. He felt such decisions could be made because the organizational crisis provided him a flexibility that might not have been present otherwise.

Andrews gave attention to matters SSC and FEMA (as well as he) deemed important. He kept the planning partner concept, but eliminated the tableau as a conceptual device used externally for molding that partnership. It was retained as a mechanism for staff development and training. But outside SCEPP, much simpler guidelines would be "suggested" to partners. Partnerships would evolve on a more individualistic and decentralized basis. There would be less overt central SCEPP guidance. Finally, he narrowed the scope of SCEPP. He did not go back to the original notion of SCEPP, focusing almost exclusively on prediction. He kept the goal of preparedness for an unpredictable, catastrophic earthquake. However, he did reemphasize the more limited goal of prototype prediction planning. This brought SCEPP more into the orbit of research, development, and demonstration of what was new, rather than making it appear an all-purpose disaster preparedness organization.

What was being done was extremely subtle, and a matter of emphasis and appearance. But appearance was important. Ledbetter had set out to become "Mr. Earthquakes" in California. He had made himself an issue. Andrews consciously stepped back from such a role. He talked about the threat, but not about it so "out loud," to use Ledbetter's terminology. He adapted his style to what the system would accept, and, in so doing, sought to change the system. Also, what was being attempted was to bring SCEPP's mission into line with what could actually be accomplished with its existing resources in the short time still available. Preparedness was indeed the overarching mission, but SCEPP's role in preparedness was limited, or at least it was being made at this point to seem more limited than had been the case. In short, during the summer 1981, Andrews repackaged SCEPP. The product may not have been that different from what it was under Ledbetter. But the impression was that a more restrained and modest organization was in being. It was stronger for being more restrained. More restrained, it was less threatening, and also more credible.

Developing a final work plan for the project (instead of further refinements in the tableau) became a major objective of the summer. It also served as a forcing function on SCEPP, SSC, and FEMA to reach consensus on priorities and roles. All the talk now had to be written into what constituted a basic agreement on what SCEPP would do and what the nature of the accountabilities were. It was not just a plan about "what." It also dealt with "who." There were many involved in working on the plan, especially Andrews and Flores from SCEPP, and Olson from SSC. On August 20, 1981, the work plan was released, discussing goals, objectives, approaches, products, and roles.⁴⁹

SCEPP's basic goal was "to stimulate preparedness for predicted or unpredicted catastrophic earthquakes in the most heavily populated portions of a five-county region in southern California." Its objectives were to develop both a prototypical planning process and plans with selected public and private users for responding to a predicted or unpredicted catastrophic earthquake. These would include transferable educational and informational materials. In addition, it was SCEPP's objective to "develop a model comprehensive regional management system for response to predicted or unpredicted catastrophic earthquakes." Its approach emphasized locally-based partnerships, with the initial plans involving a county, a large city government, a smaller city, the private sector, and selected social groups or units.⁵⁰

The work plan spelled out in specific detail roles of SSC and PAB. The SSC was to be the "executive agency" in terms of carrying out the cooperative agreement with FEMA. However, PAB was to "oversee" the project on SSC's behalf. This included policy development, and recommendation of those policies to the SSC. To assure communication, the SCEPP project director was to meet and consult with the

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SCEPP, Work Program, August 20, 1981.

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Ibid.

PAB chairman and SSC director on a regular basis. Furthermore, the PAB chairman would sit as ex officio member of SSC, and the director of SSC would serve in the same capacity vis-a-vis PAB.⁵¹

The elevation of the PAB chairman to SSC was especially significant. It provided an institutional device for better communication. Also, from SCEPP's perspective, it provided a symbol of the importance of SCEPP. SCEPP was not just another activity. It was special. Its PAB chairman had a status that was indicated by his SSC position. Ironically, the perspective of Rigney, who suggested the move, was quite different. He wished to reduce the importance of SCEPP to that of any other committee of SSC. All other committees had a member of the commission as a chairman for better communication. This would put SCEPP in the same relationship to SSC as any other committee, except Givin did not have voting rights. He could, however, attend all commission meetings, and he did in fact regard this as a symbol of SCEPP's status, rather than something else.

Perhaps because of the various ambiguities, the arrangements and the work plan stood as both a symbol that all was well in California and a treaty among the principals within the state. If the project director was careful, and could keep both PAB and SSC informed and satisfied, he would do well. If not, he could find himself suffering the same fate as Ledbetter. FEMA was not party to this treaty since it was a matter internal to California.

However, FEMA was indeed party to another treaty--the cooperative agreement with California. It had been a close observer and participant in the summer discussions, since California parties had to get the cooperative agreement amended on the basis of what they believed could now realistically be delivered. The work plan and cooperative agreement had to jell. Thus, in September 1981, the cooperative agreement was amended. The new agreement promised the

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Ibid.

products listed in the work plan. The prediction plan for the Los Angeles area was retained as a requirement, but the September 1981 deadline was dropped. The original contract had said little about institutional roles within California. In line with the new work program, the revised cooperative agreement had considerably expanded language. Also expanded, in conformance with the work program, was the statement concerning what SCEPP would do in the Los Angeles metropolitan area. The original agreement spoke only of a response plan involving prediction. What SCEPP intended to do, now, was more comprehensive. Most importantly, this meant a reaffirmation that Los Angeles would be a partner with SCEPP, in spite of the difficult beginnings. It also meant that SCEPP and FEMA regarded Los Angeles as a partner with which SCEPP should work intensively and deeply. It should be a model for "other high risk metropolitan regions." The key provision was as follows:

Develop a comprehensive prototype earthquake preparedness response plan for responding to an unpredicted or predicted event within the Los Angeles metropolitan area. This plan is to include: (1) a model planning process for: (a) developing a prediction/warning system; (b) responding to earthquake predictions; (c) responding to unpredicted earthquakes; (d) guiding short-term recovery; and (e) guiding long-term recovery; (2) specific prototype plans for: (a) one county jurisdiction; (b) one large city government jurisdiction; (c) one small to mid-size city jurisdiction; (d) selected entities of the private sector; private sector entities, including plans for a high rise structure, a bank, an apartment complex, a large corporation, a transportation network, an airport complex, and four small businesses; and (e) selected social groups or entities, including non-English speaking populations, elderly, schools, handicapped, mobile home residents, and tourists; (3) a model regional management system for further planning, coordinating, and response for both predicted and unpredicted catastrophic earthquakes.

The prototype earthquake preparedness response plans developed are to be integrated into a regional management system and designed so as to be transferable to other high-risk metropolitan regions.⁵²

Thus, a summer of crisis ended in a stronger SCEPP, both from an internal and external perspective. In September, Andrews--a history professor turned earthquake entrepreneur--was fully endorsed as permanent project director by the PAB. SSC happily concurred. FEMA did the same, informally. There was absolutely no reason to have expected that Andrews would have succeeded as well as he did. But he had--in the words of one participant-observer--"risen to the occasion." To make it absolutely clear that he was determined to succeed, Andrews resigned his tenured position at the University of Redlands.

It was now one year after SCEPP was born. It had a hard working and reasonably set staff on board, one whose morale had been up and down, and was now up again. It had a "final" work plan, a revised FEMA contract, a director no one could afford to have fail, and a new appreciation of intergovernmental power relationships and the importance of avoiding another conflict. SCEPP had passed its initial survival test.

D. IMPLEMENTING A PROGRAM

In the fall, Dennis Mileti returned to Colorado State University, and Rusty Gagnon also departed. The latter move was forced by Andrews, who was continuing to remake SCEPP in his own model. From an internal standpoint, SCEPP was more cohesive and close-knit than it had ever been. Esprit was high. The staff was now essentially complete and stabilized, with approximately nine full-time professionals. The staff was relatively young (late 20's or 30's), interdisciplinary, bright, and exceptionally motivated. Many were not married, and, hence, were in a position to make SCEPP more than a full-time job. Sixty-hour weeks were common (as they had been from the outset). Whatever their original background, SCEPP staff played roles as generalist-planners. They were all schooled in the new SCEPP approach to users: "We are resources; we work for you." They were, more than ever before, a team. Internally, SCEPP was ready to implement.

All was not perfect externally, however. The problem was not the state, this time, but FEMA. The "federal father" of SCEPP was Thiel, and he resigned from FEMA in October 1981 for a major corporate assignment. The Thiel departure did leave a vacuum, and it was not clear who would or could fill it.

This uncertainty was not allowed to dampen SCEPP spirits. It had its funds, and a renewed sense of mission. It at last was ready to start implementing its program in earnest. One front involved prediction response; the other, the planning partnerships.

Japan and Earthquake Prediction

With respect to prediction response, SCEPP was mandated to send a research team to Japan to study what the Japanese were doing and to transfer to the United States/southern California relevant institutional models. There was some concern within PAB that this not be viewed as a "boondoggle" in California, but there was no philoso-

phical disagreement with the notion of learning and transfer. SCEPP was at the frontier of thinking within the United States with respect to prediction response, but not at the frontier of world thinking. To get there, it had to go to Japan.

In October 1981, SCEPP sent an eight-member team to Japan for two weeks. This included Burts, Andrews, Davis, Cheney, Joan Arias (education program supervisor of SCEPP, who had joined SCEPP in June 1981; like Andrews, she was an ex-university professor. Her field was languages), John Sucich (FEMA Region IX), Sommerville (consultant seismologist), and Gordon Berger (consultant-interpreter from the University of Southern California). Burts served as head of the delegation. Givin went also. His way was paid by IBM, so he combined the SCEPP work with some work he was doing for that corporation. The choice of Burts was important. It was one way Andrews had to show the importance of Los Angeles to SCEPP. It was also a way to help silence critics of the trip as a boondoggle. Burts was a busy and important man, who did not have the reputation of getting involved in boondoggles. This helped diminish the concern in PAB.

What the delegation found was remarkable. Japan had passed legislation in 1978, the Large-Scale Earthquake Countermeasures Act (LECA).⁵³ This legislation assumed earthquakes in Japan could and would be predicted. It authorized special policies and arrangements to be taken to use the lead time for maximum advantage. An earthquake assessment committee was set up to advise the Japan Meteorological Agency (JMA) when an earthquake was coming. JMA would then notify the prime minister, who would issue the official warning. Once that warning was made, a special command center or headquarters would be established at the national, prefectural, and local levels to direct actions to be taken, including evacuation.

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SCEPP, Japanese Earthquake Prediction/Preparedness Program, October 1982.

In 1979, the Tokai district (an area south of Tokyo in central Japan, bordering the Pacific) was designated as the first area where a quake would be predicted under LECA. Massive deployment of seismic instrumentation took place to detect the short-term precursors. In 1980, special funding legislation was passed to subsidize preparations in Tokai for the expected great earthquake. Tokai was under a long-term prediction (approximately 10 years from 1976). What the scientific community and government were aiming for was prediction based on short-term precursors. At stake were many thousands of lives--11,000 just in Shizuoka, the Tokai prefecture most at risk. In Shizuoka, walls were being constructed to protect the low-lying cities against tsunamis. Japan had a special earthquake assessment committee that met regularly and could be called into special session. The media had agreed on a 30-minute moratorium on announcing an assessment committee's emergency meeting. This would give the government time to mobilize for the expected public reaction. The informal understanding between government and assessment committee was that the latter could afford to issue a few false alarms, and the economic costs would be borne by those affected. The point was not to miss the "big one." Under those conditions, there was optimism among Japan's leading seismologists, who served on the assessment committee, that they could predict this particular earthquake.

Japan thus had made many decisions and set up a system for prediction and response. The resource commitment of the national, prefectural, and local governments involved was well over \$2 billion (\$1.7 billion over five years from the national government). There was even a counterpart to SCEPP--the Earthquake Countermeasures Division of Shizuoka prefecture. The difference was that this organization was a regular agency of government (rather than a temporary project organization) and had more financial and legal authority. Moreover, it had the strong backing of the Shizuoka governor, a type of backing SCEPP did not have from Governor Brown.

Indeed, Brown ignored SCEPP.⁵⁴ Most importantly, the Japanese counterpart to SCEPP had a federal policy environment that established national guidelines and funds specifically for prediction response and preparedness measures. Japan had thus established a national policy for earthquake prediction/preparedness, as had the U.S. (through NEHRA and SCEPP). However, the Japanese policy was well beyond what was occurring in the United States. Earthquake prediction and preparedness were taken seriously in Japan and had a much higher national priority.

Japan was indeed a model. Was it one transferable to America and California? SCEPP thought so. The team returned exhilarated. The Japan trip reenforced the notion that prediction could be a forcing function for earthquake disaster preparedness in general. In effect, southern California, like Tokai, was already under a long-term prediction--a better than 50-50 probability of a great quake within 30 years. The urgency was not as immediate as perceived in Japan, but it was there. SCEPP had to be a catalytic organization for adapting various elements of the Japanese system to the U.S./California setting, to the degree that was appropriate. It would have to do this from the bottom up, however, since there was no national policy on the order of LECA, or prospect of one in the near future.

In December 1981, SCEPP started the process of transfer with an earthquake prediction workshop at Asilomar. Attending were 43 federal, state, and local officials, as well as scientists and media representatives. There, four key issues relating to the management of earthquake prediction response were discussed:

1. the structure and organization of the prediction-warning/communications system;

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He had his own earthquake preparedness entity, the Governor's Task Force, discussed in a separate study.

2. the prediction-warning terminology;
3. the nature of public prediction warning and announcement; and
4. prediction education and information.⁵⁵

SCEPP, under Ledbetter, had had a task force working on the first two issues. Their ideas could now be exposed to a larger audience. The last two issues were components on which little work had been done up to this point, and which the trip to Japan showed were central to responding to an earthquake prediction.

The structure of the workshop was such as to bring together in one place, for the first time, most of the elements of a coalition necessary to apply earthquake prediction in southern California. It is noteworthy that the Los Angeles Times refused representation, apparently on the grounds that it did not wish to be coopted into a governmental enterprise. One of the successes of the workshop was that scientists began talking about local government problems, and local government officials focused on some of the scientists' problems in making predictions in which they had far less than total confidence.

Aside from bringing a new awareness, based on lessons from Japan, of "what could be" in California, the workshop served to enhance considerably the image of SCEPP. As Andrews later recalled: "It showed that we could do something." More precisely, it showed that there was indeed a technology transfer role to be performed--between Japan and the U.S., and within southern California--and that SCEPP was an appropriate organization to fill that role. Some entity had to pull various other parties together to make transfer happen--an organization devoting full time to this one task. This was needed, legitimate, and, just maybe, SCEPP could do it.

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Southern California Earthquake Preparedness Project,
Earthquake Prediction Warning/Communications Workshop,
December 1-4, 1981: Task Group Assignments and Readings.

That role was needed for earthquake prediction, and it was needed in planning for the unpredicted catastrophic quake. SCEPP had tried to play that role already, in connection with its planning partners. But it had not done well. In contrast, Asilomar had been carried off well. SCEPP had to improve its record with the planning partners, in a context that went beyond prediction to preparedness in general.

Preparedness and Planning Partners

San Bernardino continued to be the principal success story. There had been some difficult moments in the early days, but the political backing for the partnership in San Bernardino had not waned. Once Littlefield was given the assignment to fulfill the partnership (in April), he decided this would be done, in spite of SCEPP, if necessary. By fall, it was clear that SCEPP and San Bernardino would be able to work closely together to mutual benefit. The principal reason was that SCEPP was not pushing a particular planning approach (tableau), but was trying to fit its ideas into the framework San Bernardino found comfortable. For example, with prediction, the original SCEPP view was quite complicated, with planning geared to several time frames and probabilities of a quake's occurrence. What San Bernardino wanted were a minimal number of time frames, and SCEPP now went along with this position. What made sense to the county were time frames of, say 1-3 months, and a short-term time frame, 1-7 days. It wanted policy planning geared to these, in part because it had goals, from the outset, that were broader than prediction. It was interested in using the opportunity presented by SCEPP, the great earthquake and prediction, to develop ideas and programs related to integrated hazards planning. San Bernardino had many hazards, natural and technological, and wished to be able to respond to all in some systematic manner. The San Bernardino connection contributed to his initial hiring. With Flores, SCEPP now seemed bent on what it regarded as a simple programmatic solution to both prediction and integrated hazards management rather than a complicated academic approach.

At the same time, the county wanted help on immediate response--the first 72 hours, and short-term recovery--the first month after the event. SCEPP was anxious to please, and Flores led the SCEPP effort with San Bernardino. Flores was known to San Bernardino. He had worked as a consultant project director on the Binational Symposium on Human Settlement Along the San Andreas Fault, to which Rigney was co-chairman with his Mexican counterpart.

Littlefield, meanwhile, put together a task force for planning on the county's part. He worked first to get the cooperation of the mayor of San Bernardino, which was forthcoming. The objective was to make the task force one that represented interests of both the county and city.

Eventually, 13 committees were formed dealing with various functions. SCEPP's role was to work with Littlefield and the functional committees, assisting wherever possible. The committee began meeting every month. After some false starts, in terms of having genuinely interested people on the committees, the task force could be said, by the end of 1981, to be moving forward--with SCEPP regarded as a useful partner.

A second planning partnership to which SCEPP gave attention during this period was that concerning Security Pacific Bank. SCEPP was obligated under its FEMA agreement to work out a partnership arrangement with the private sector, as well as public sector jurisdictions. More than willing to work with SCEPP was Security Pacific. Its headquarters was in a skyscraper building in downtown Los Angeles. This company had two people at the middle management level deeply interested in earthquake preparedness: Barry Himel, vice-president for Emergency Planning, and Debbie Jacob, vice-president for Executive Protection.

Jacob became aware of SCEPP during the summer 1981 while attending a conference at which Andrews spoke. She talked with Himel and they agreed that SCEPP might be able to help them. They invited Andrews to come over in July to discuss mutual interests. Attending the

meeting was Jacob's immediate supervisor. The San Bernardino agreement was discussed as a possible model. From the standpoint of Himel and Jacob, SCEPP could buttress their credibility in getting change within the bank. They took the notion of a catastrophic earthquake seriously and wanted to get the support of the bank's top management for greater preparedness activity. This was followed by another meeting, over lunch, among Himel, Jacob, Andrews, and a key executive vice-president, Irv Margol. The conversations went well, and Himel and Jacob awaited a proposal from Andrews to launch a planning partnership with Security Pacific. From the standpoint of Himel and Jacob, Andrews was moving too slowly.

In October, Andrews and the SCEPP research team were in Japan. By chance, Jacob was also there, attending a Security Pacific international corporate meeting. She and Andrews had dinner together, and she pressed Andrews to strike while Security Pacific was ready. Andrews, however, in Japan, had occasion to meet a top executive of the bank, who made it clear Security Pacific's interest stopped short of earthquake prediction. A credible prediction could be a horrendous economic problem for a bank, Andrews was told. The particular individual told him he would rather be surprised than forewarned.⁵⁶

Back in California, discussions now commenced in earnest. There was top management support for Jacob, Himel, and SCEPP to begin developing a planning partnership. But the message that came down to them was: "Back-burner the subject of prediction. We have enough problems. Prediction is down the line." Andrews assigned one of his newer staff members, Gilbert Najera, to work on the Security Pacific relationship. This Najera did, in the remaining months of 1981, with prediction continuing to be an issue on which there was disagreement. Still, SCEPP was positive in that a dialogue with a

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Richard Andrews, "Earthquake Prediction and Preparedness in Southern California: Science and Public Policy," paper presented to the Annual Meeting of the Seismological Society of America, April 20, 1982.

large private corporation was underway. The fact was that this organization--or at least strategically located individuals within the organization--seemed to want SCEPP.

Then, there was Los Angeles. In Los Angeles, SCEPP had a strong ally, close to the mayor, in Burts. Andrews had made Burts head of SCEPP's delegation to Japan, and Burts' interest in the subject of prediction/preparedness remained quite strong. But Burts continued to take the position that he would not force SCEPP down the city's throat. SCEPP had to woo the people it had alienated. He would help, but it would take time.

When Andrews succeeded Ledbetter in June, he initiated overtures. Andrews felt quite differently from Ledbetter about Los Angeles. In his view, SCEPP needed Los Angeles more than Los Angeles needed SCEPP. A southern California project without Los Angeles would be hollow indeed. The key people whose minds had to be changed were Morrison and Mattingly. They represented, respectively, the key line and staff organizations involved in emergency management for the city. Burts was a political man, and he was in SCEPP's corner, a member of PAB, but he was also of the city. There were limits to the role he could or would play on SCEPP's behalf.

However, he was convinced Los Angeles was in a position to play a lead role in southern California's prediction/preparedness activities. It could be a model to the state and nation. SCEPP, he asserted, could help. Toward that end, he arranged a meeting among Andrews and some of the principals who had attended the earlier meeting with Ledbetter. The meeting took place shortly after Andrews succeeded Ledbetter. Mattingly and Bruce were there, along with George Knop, representing Morrison. Andrews tried to show he was out to assist Los Angeles to do what it wanted to do, rather than vice versa. The meeting eased some of the earlier tensions, but the city administrative people were still skeptical. They saw little to be gained by the city. What they saw instead was more work to help a group which would eventually go away once its federal contract expired. Complicating SCEPP's position was that another

group, possessing a federal grant from NSF, was in a position to actually pay for some city staff time on its project. If one federal project could provide assistance, why could not SCEPP? Without some SCEPP commitment of resources, Los Angeles was not prepared to move more quickly towards augmented preparedness goals--it was simply beyond what their priorities would permit. Andrews came away from the meeting aware that it would take some bargaining to reach an accommodation. The city people were aware that they were in a strong position from which to bargain. Also, they still felt SCEPP did not yet have its act together.

On November 4, Flores sent Mattingly a rough draft of a possible MOU between Los Angeles and SCEPP. Three weeks later, on November 25, Flores, Andrews, Bruce, Burts, Mattingly, and Morrison met to discuss the draft MOU. Commander Morrison raised concerns about the MOU's lack of specificity. Mattingly also pointed out some problems from a standpoint of city policy. The meeting ended with the understanding that Mattingly would put the city's point of view in writing so that this might be incorporated in a second draft by SCEPP.

The Asilomar earthquake prediction meeting in early December was notable for the absence of Mattingly and Morrison; an absence that Morrison attributed to SCEPP's failure to formally invite these two key city administrators. Burts attended, as did Mattingly's assistant, Erica Freeman. Freeman herself regarded SCEPP as a time-consuming nuisance, and Asilomar did not change her mind.

The year ended with SCEPP having a problem with its most important potential planning partner. The problem was the lack of enthusiasm for SCEPP at the administrative level of the city. There was hope, however, because of Burts. The Mayor's Office was behind SCEPP, and therefore the administrators had to keep talking with this organization, or at least go through the motions of doing so. Andrews himself was determined to keep trying, and gave reconciliation with Los Angeles the highest priority. He could see progress, but it was slow. Mattingly was the principal point of interaction between

SCEPP and the administrators. There was no hurry, on Mattingly's part, to move the planning partnership forward. The planning partnership may have been a top priority for SCEPP, but it was not for her, and it was up to SCEPP to show her why she should change her mind.

E. PROGRESS AND PROBLEMS

Administration and FEMA Changes

Thiel's leaving in October 1981, and the shift of administrations in January 1982, meant uncertainty for SCEPP in terms of FEMA. One element of continuity was Terry Meade, at the regional level. A middle aged, retired military man, Meade was a source of both support and exasperation to SCEPP. The exasperation came from his pressure on SSC and SCEPP to deliver "products." At the same time, he was one of the few professional emergency managers who was able to give the next great California earthquake his continued strong attention amidst the series of day-to-day crises with which he continually had to deal. In charge of natural hazards for FEMA Region IX, he had played a large role in the original cooperative agreement with California. Before Thiel left FEMA, he had told Meade that he would now have to carry the ball because there was no one at FEMA headquarters who had both the authority and interest to maintain a FEMA presence in keeping SCEPP on target with national goals.

Thiel was correct, and with the change of administrations, the situation at FEMA grew even more unclear. There were a series of reorganizations that had the effect, ultimately, of reducing the status, if not the funding, of earthquakes. Meade took it upon himself to protect SCEPP in the transition.

At Meade's urging, Andrews, Olson, and he went to Washington from March 1-5 to brief new FEMA leaders on the nature and course of SCEPP. The key officials were Lee Thomas and Richard Sanderson. Neither was a "Mr. Earthquake" in the manner of Thiel. Both had many hazards within their purview. They had to be as concerned about hurricanes and toxic spills in the east as earthquakes in the west. Also, the NSC/FEMA report on a catastrophic California earthquake, published by FEMA in November 1980, was a Carter document. The new administration had little interest in any relic

from the Carter past. This was true even though the President, Ronald Reagan, was from California, as was his appointee as FEMA director, Louis D. Giuffrida. It would take some time for the earthquake matter to regain presidential priority. Nevertheless, the briefing seemed to pay dividends in recapturing for SCEPP a high visibility and importance to FEMA. SCEPP appeared to be going well, and it was important to FEMA that it be able to show successes to Congress. FEMA was the lead agency for implementing the Earthquake Hazards Reduction Act of 1977, as Congress was reminding it.

A week later, on March 11, Cal McElwain, member of SCEPP's PAB and supervisor of San Bernardino, testified before the Joint Hearing of the House Subcommittee on Science, Research, and Technology (headed by George Brown of California), and the Senate Subcommittee on Science, Technology, and Space. Lee Thomas also testified on behalf of FEMA. In general, Congress was pleased with SCEPP, but was not otherwise pleased with FEMA's handling of the Earthquake Hazards Reduction Act. It felt it saw very little leadership being displayed.

All this worked to SCEPP's advantage in Washington. Meanwhile, Meade was educating the new political appointee of FEMA Region IX, Robert Vickers, as to the merits of SCEPP. Vickers understood SCEPP's symbolic as well as substantive importance. It was an "action" project. It was evidence to Congress that FEMA was doing something. His only concern, as he noted to Meade, was that SCEPP seemed misplaced. As an individual who had at one point in his career been a director of OES, he was uncomfortable with SCEPP's location under SSC. Also, the general way FEMA dealt with California (and other states) was through a sole agency, OES. Meade sought to explain the situation, but Vickers remained uncomfortable.

Thus, SCEPP was not hurt by the political shift of officials, in Washington and Region IX. This was because of continuities such as Congressman Brown and Meade. But it was clear that circumstances had changed. Thiel's absence meant there was no "Mr. Earthquakes" in Washington--i.e., a zealot interested in earthquake problems

above all else. There were, instead, generalist administrators interested in earthquakes as part of an overall hazards mitigation mission. This meant more leeway at the regional level to assert leadership. Vickers gave indications of wanting to play a leadership role.⁵⁷ However, his "OES orientation" was viewed with considerable concern by SCEPP, PAB, and SSC.

It was an uncertain time, given the political and administrative transition, but SCEPP was nevertheless coming out in reasonably good shape. In fact, SCEPP was being given the word that FEMA would supplement its budget by \$250,000 that year and even extend its lifetime beyond the scheduled termination date of June 30, 1983.⁵⁸ Nothing was certain, but FEMA was telling SCEPP to keep working on implementation. Perhaps FEMA needed SCEPP, as much as SCEPP needed FEMA.

Continuing With The Planning Partners

The planning partnership that was taking most of SCEPP's time was San Bernardino; the one giving it the most trouble was Los Angeles. Security Pacific lay somewhere in-between.

San Bernardino - Various SCEPP staff were working with the functional committees San Bernardino had formed (transportation, water/sewer, etc.). This entailed developing plans for the different committees in four parts:

1. The first was response to a "long-term predicted earthquake," that is, one which was predicted to occur one to two years in the future. This would include long-term planning actions such as changing building codes, identifying hazardous facilities, developing response plans and the like.

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The previous regional director was a civil servant. Vickers was a political appointee.

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The extra \$250,000 was primarily for educational outreach materials.

2. The second part was a response plan to a "short-term prediction" where the earthquake was predicted to occur in one to seven days. In this instance, plans would call for those kinds of actions which would disrupt the normal way of life and could involve such things as closing facilities or businesses, regulating traffic, protecting critical utilities and facilities, and the like.
3. The third part was the "immediate response plan" of actions to be taken immediately following the disaster and through the first 72 hours where individuals would be essentially on their own, helping one another.
4. The fourth part, "short-term recovery," was a continuation of the immediate response activities and would include restoring supply of food, water, shelter, communications, power and transportation, and similar actions to be taken during the first month after the disaster.⁵⁹

SCEPP performed background research as well as actual policy development. SCEPP worked with county personnel on education-curriculum development and public information programs and materials. In addition, SCEPP was active on neighborhood self-help planning with the county. Flores, Arias, and two newer staff members, Mark Zierden and Cheryl Tateishi, were quite active in San Bernardino. Others participated as needed. This effort was taking approximately one-half of SCEPP's overall staff time, but it was regarded as critical that the San Bernardino "pilot" be done well. While not all functional committees were equally busy, and private sector participation was a continuing problem, there was progress. SCEPP was able to combine a number of items required in its agreement with FEMA. It was also able to bring to bear on the San Bernardino planning process, work being done for the Governor's Task Force by State Geologist Davis.⁶⁰ It arranged for him to make a presentation on March 12, 1982, regarding the threat scenario maps and estimates he was developing for the San Bernardino area. This helped San Bernardino committees better adapt their response plans to the reality of the threat.

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San Bernardino County, Emergency Plan, December 1982.

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The Governor's Task Force is discussed in a separate case.

Over the next several months and into the summer, drafts of plans were prepared by various committees and circulated for adequacy and compatibility. Attention was given to the Neighborhood Watch effort (created for crime-fighting), already in place as a way to enhance public awareness. By the end of the summer 1983, Littlefield was persuaded that the planning effort was going well and would be completed on schedule.

Los Angeles - The Los Angeles partnership continued to be a problem. Progress was made, but--from the SCEPP perspective--with painful slowness. On January 6, Mattingly wrote Flores regarding what would be necessary to have an acceptable MOU between SCEPP and Los Angeles. Mattingly stated that any meaningful agreement between the project and the city had to be based on:

1. Identification of specific goals, objectives, and outcomes/work products (benefits) to be achieved; and
2. Identification of the city resources and work effort needed for the project, and the source of these funds.

She went on to say that "our primary concern must be what can we really do to mitigate the loss of life and property when a major earthquake hits. . . . In the absence of a bonafide earthquake prediction capability, our current emphasis should be on mitigation of damage from an actual occurrence." She asked SCEPP to review what the city had done, what it most needed to do, and how it might afford what it needed to do, as in the communications area. "The project needs to identify and deal with realistic, potentially solvable problems. . . . Emphasis on prediction planning within the city organization, in the private sector, and in community groups does not appear realistic in terms of the 'state of the art.'" She

also indicated that it would help if SCEPP would finance city staff for any assistance it might provide SCEPP.⁶¹

On February 4, Burts, Andrews, and Flores convened at SCEPP headquarters to discuss alternatives that might serve as a basis for a MOU between SCEPP and the city. On the basis of this meeting, on February 16, SCEPP sent Burts a draft of a memorandum involving options stressing: 1) comprehensive earthquake preparedness planning (i.e., earthquake prediction response; earthquake disaster response; and long-term recovery); and (2) small business earthquake preparedness; and/or community-based earthquake preparedness. What Los Angeles still wanted to see was a greater commitment by SCEPP to address the legal issues with respect to evacuation.

Subsequent to this meeting, there were further conversations between city staff and SCEPP. Various drafts of a SCEPP-city MOU were prepared. On March 23, Mattingly wrote Burts and Morrison her view that there was progress taking place. However, she remained concerned that a great deal of city staff time would be involved and "we have not fully identified the city resources and work effort needed for the project and the source of these funds." She felt that a variety of city agencies would be engaged, such as the planning department on long term reconstruction, and the small business assistance office as possibly working with SCEPP on small business earthquake preparedness development. In fact, she noted, virtually every city department could be involved in one way or another. A great deal of coordination would be entailed. She thought it only fair "that SCEPP should fund a city position for this purpose."⁶²

There were still further conversations and drafts. It was made clear that SCEPP had no money (or would not use its money) to fund

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Letter, Shirley Mattingly to Paul Flores, January 6, 1983.

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Memo, Shirley Mattingly to Ezunial Burts and George Morrison, March 23, 1982.

staff time. The city, which was having severe economic problems and actually reducing its staff, would have to add SCEPP to its existing burdens. Burts regarded SCEPP as worth the investment of time. Mattingly and Morrison were skeptical. They did not believe it was inevitable that there would be a successful resolution of the differences. Nor did SCEPP. Burts was a broker, but allowed the principals to make the decision. Relations were subtle. Flores, in particular, worked hard to make sure SCEPP bent over backwards to be responsive. SCEPP redrafted memos more and more in terms that fit what it thought the city wanted, and was saying it would do almost all the actual work involved. But Los Angeles did not feel that SCEPP was being professional; transcripts ignored some major issues discussed at meetings and deadlines were not met. Eventually, several drafts later, a memo was written that seemed satisfactory to the city. On April 28, Mattingly attended a PAB meeting and indicated that the city was ready to go along with the MDU that was presently on PAB's agenda for consideration. PAB approved this memo, in principle. The ball now went back to the city.

On May 4-5, Andrews attended an Earthquake Planning Conference for Business and Industry held at the Century Plaza Hotel in Los Angeles. This conference was organized by Tony Prud'homme, an executive with ARCO in charge of emergency planning. This was one of a number of ad hoc earthquake activities taking place every once in a while in Los Angeles. SCEPP chose to participate in this particular activity. It turned out that Commander Morrison was also a participant. Andrews and he had occasion to get together in a hospitality suite at the Century Plaza to discuss mutual interests (and differences). The atmosphere was informal--there were about 25 others present. The SCEPP-sponsored suite was a pleasant forum for conversation. For the first time, Andrews felt relations between Morrison and himself seemed to warm.

Informal relations were helping smooth the way on the formal side. Thus, at the same time, a Los Angeles City Councilman, Hal Bernson, was promoting the holding in Los Angeles of an international conference on earthquakes. The mayor and his agencies were cooper-

ating. This meant city staff time would be devoted to planning for such an event. SCEPP volunteered to help. There were those connected with the SCEPP project who warned that getting involved in an activity of this kind carried risks, in the event the conference was unsuccessful. With Flores pushing hard for an affirmative response, SCEPP concluded there were potential benefits also. How could it purport to "lead" in earthquake preparedness policy if it were not a participant in an event of this kind? Such free assistance was appreciated by the city. Slowly, outside the formal MOU interaction, SCEPP's image improved.

On July 27, 1982, Mattingly said yes to a draft MOU with SCEPP. This memo emphasized city-SCEPP efforts to:

1. Complete the city's draft earthquake prediction response plan;
2. Coordinate with the [NSF-sponsored] Pre-Earthquake Planning for Post-Earthquake Recovery (PEPPER) project; [This was the project in Los Angeles that paid staff for their time in assisting the project.];
3. Research and propose action on federal disaster assistance, legal authority and liability of the City in its earthquake prediction response including evacuation, and options for adequate earthquake insurance coverage;
4. Stimulate private small business and industry planning for an earthquake;
5. Develop emergency preparedness and response information for the handicapped.⁶³

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Memo, Shirley Mattingly, July 27, 1982.

She recommended that the memo be approved by the mayor and city council. Burts was elated and said that the city staff had developed sufficient confidence in SCEPP so that "we can buy into this effort."⁶⁴ For Andrews, it was a relief. He had expressed the view that the point beyond which it would be difficult to do anything with the city in the period left to the project was fast approaching. After going through the City Council's referral and hearing procedure, on September 28, 1982, the City Council approved the agreement and it was signed on September 29 by Mayor Tom Bradley.⁶⁵

Security Pacific - The Security Pacific arrangement was less complicated for SCEPP, although not without its own problems. For SCEPP, Security Pacific was important for two reasons. One was the fact that it represented a chance to work with the financial community through perhaps its single most important southern California bank. The other was the fact that it was an opportunity to develop a planning partnership for a high rise building in the middle of downtown Los Angeles. This would mean SCEPP could fulfill more than one goal of its cooperative agreement with FEMA. It had the support of Himel and Jacob. They were like Burts--inside-entrepreneurs. But they needed an outside entrepreneur to get action from others in their organization. For them, the others were at the top of the organization. Burts was already at the top of his organization. What he needed was for the middle-level bureaucrats to go along. For that to happen, SCEPP had to win their confidence as, at last, it seemed to have done.

A major step was taken in Security Pacific on February 10, 1982, at a luncheon meeting. Andrews, Himel, and Jacob attended, along with an executive vice-president, Irv Margol. A general consensus was reached as to what would go into a MOU. Three meetings ensued

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Communication to the author.

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SCEPP/Los Angeles, Memorandum of Understanding, September 29, 1982.

involving Najera, Himel, and Jacob. By March, they had a work plan developed for a MOU. On March 18, John H. Harriman, senior vice-president, wrote Andrews confirming the bank's willingness to work with SCEPP. He referred to a planning arrangement instead of "planning partnership," since the latter had a specific meaning in the banking community. In a work plan, there were two areas that were given emphasis:

1. development of plans and strategies for preparing for a catastrophic earthquake including mitigation and employee education programs, procedures and policies for responding to a short-term earthquake prediction and the occurrence of a catastrophic earthquake, and development of specific recovery strategies and guidelines; and
2. model plans for minimizing structural and non-structural damage in Security Pacific high-rise corporate headquarters and guidelines for employee safety in the aftermath of a damaging earthquake.⁶⁶

SCEPP managed to get prediction mentioned in a statement: "The main impetus of this planning arrangement is to adequately prepare SPB [Security Pacific Bank] to respond to a predicted or unpredicted catastrophic earthquake event." However, prediction remained a source of disagreement between SCEPP and the bank. There was willingness to agree to disagree on this matter, and move forward anyway. If SCEPP wanted to think about prediction, that was fine, but the bank had no intention (at least publicly) of getting into that thicket.

A formal MOU was finalized in late March. Harriman and Himel signed on behalf of the bank on March 25. On April 21, Andrews signed on behalf of SCEPP, and, with PAB's concurrence, Givin affixed his signature April 28. The memo reflected the two emphases already noted. However, there was no mention in the MOU of earthquake prediction. "The objective of this work-sharing arrangement," said the memo, "is cooperative planning in the formulation of various emergency procedures and plans in preparation for a major earth-

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SCEPP/Security Pacific, Work Plan for Planning Partnership:
Security Pacific Bank, March 1982.

quake."⁶⁷

Himel was assigned by SPB to work on the SCEPP planning partner effort full time. In ensuing months, a needs assessment got under way, along with a review of the bank's existing preparedness procedures. An employee education/information program was investigated. Finally, in summer 1983, SCEPP and SPB were exploring the possibility of enlisting the help of a consulting firm to assess SPB's non-structural loss probabilities.

With the approval of the new arrangement, Himel, Jacob, and Najera started broadening the coalition of support within the corporation. In April, they explained what they were doing to a contingency planning committee. This consisted of individuals from various sections of the bank, and was headed by another executive vice-president.

New Initiatives

Starting a New Partnership - By the summer, SCEPP had enough confidence in what was happening with San Bernardino, Los Angeles, and SPB, that it felt it could try to expand its local efforts. SCEPP began conversations with Ventura County, a "natural" in terms of seismic threat. The conversations did not go well, due to apparent indifference on the part of local elected officials.

SCEPP discussed this problem with Evar Peterson,⁶⁸ member of the SCEPP PAB and mayor of Westminster, in Orange County. SCEPP wondered if Westminster could serve as a prototype small city even though Orange County was not as vulnerable to a great earthquake as

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SCEPP/Security Pacific, Memorandum of Understanding,
April 28, 1982.

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Peterson had, in the 1950s, been a regional director under a FEMA predecessor agency. Also, in the 1960s, he had been an emergency services director with the city of Long Beach, California.

was Ventura. Peterson readily agreed, and, on August 25, PAB authorized SCEPP to work out a partnership with Westminster. On September 21, a MOU was signed with Westminster.

The scope of work between SCEPP and Westminster included the following five areas:

1. Assess the threat to the city from an 8.3 magnitude earthquake on the San Andreas fault and other potentially damaging earthquakes.
2. Assist city staff in preparing a draft, four-phase earthquake and earthquake prediction response plan.
3. Assist city staff in reviewing and expanding upon those preparedness and mitigation programs showing the greatest promise in meeting the city's needs.
4. Explore the various earthquake preparedness approaches available to the city in plan maintenance, program follow-on and involvement of citizens and neighboring jurisdictions. This would include involvement of the County of Orange, Orange County Transit District and other special districts not under city jurisdiction.
5. Make available to the city all information from parallel research done by SCEPP for other planning partners for inclusion in the city's efforts.⁶⁹

SCEPP and the Scientists - While focusing on the local planning partnerships, SCEPP was also seeking to strike a new working relationship with a quasi-partner, namely, the scientific community. As a result of the Japan trip and Asilomar, Andrews was aware, as never before, of the critical role prediction could play in SCEPP's work. It was a trigger that brought attention to broader preparedness goals. It was important in its own right. It was SCEPP's special signature in the earthquake policy field. He did not believe Ledbetter had given it enough emphasis. Yet he also saw how much trouble it was going to be to advance the cause of prediction preparedness when, on the one hand, many potential users (such as Security Pacific) did not want to hear about it; and, on the other

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Memorandum of Understanding, City of Westminster and SCEPP, September 21, 1982.

hand, the potential predictors (the scientists) were seemingly less optimistic now than in previous years that they could predict. Moreover, SCEPP's specific mission concerned prediction response planning. But there could not be an adequate response unless there was a prediction and warning system to which to connect response. Japan and Asilomar showed that applying earthquake prediction to southern California would entail some major policy and institutional changes, including change at the national level.

Andrews decided that SCEPP had an obligation to push some of the recommendations of Asilomar as best he could. One front was terminology. A SCEPP committee of scientists--Davis, Robert Wallace, USGS; and Karen McNally now of University of California, Santa Cruz--had provided a set of definitions for long-term, intermediate, and short-term prediction. This terminology was endorsed by Asilomar. SCEPP wanted the scientific community, through the California Earthquake Prediction Evaluation Committee (CEPEC) and National Earthquake Prediction Evaluation Committee (NEPEC), the two official prediction assessment committees advising government, to also endorse this terminology.

In a related issue, he wanted them to endorse the finding of the ad hoc NSC study published by FEMA in 1980, namely, that there was a better than 50 percent chance of a great (8.3 magnitude) earthquake on the southern San Andreas within 30 years, based on a 2-5 percent annual probability. This was, in the Davis, Wallace, McNally terminology, a long-term prediction. He wanted it certified as such.

A major problem for Andrews was that Clarence Allen, a senior seismologist at CalTech, and NEPEC chairman, did not agree with the 2-5 percent figure. He thought the probability was less likely. If Allen was right, then much of the urgency that underlay SCEPP would be removed.

On February 9, 1982, Andrews wrote Allen in his official NEPEC capacity.⁷⁰ He started out by defining SCEPP as "a cooperative state/federal effort to develop a prototype plan of how metropolitan Los Angeles should respond to a validated earthquake prediction." He pointed out that one of SCEPP's tasks was "to develop recommendations for a prediction/warning communications system." He noted the Asilomar conference and its recommendations. He said that it had recommended that certain terminology "be adopted for standard use by appropriate public agencies." He indicated that he was asking USGS to adopt this terminology, and requested that NEPEC, "in accordance with the proposed terminology," evaluate the "long-term" forecast that appeared in the NSC/FEMA report. He noted he was making a similar request to CEPEC. "It was the feeling of local emergency officials and private industry representatives, that a review by the evaluation councils would help clarify the scientific view regarding the likelihood of a catastrophic earthquake in southern California and, in the event of a validation of the conclusions of the FEMA/NSC report, would greatly stimulate preparedness activities throughout the region." Time passed, and Andrews received no response.

On March 17, Andrews wrote Allen again, reminding him of his earlier letter, and requesting a response. Allen called and, then, on April 18, wrote Andrews. He said he was slow getting back to him because he needed the opinions of others on NEPEC. He was setting up a NEPEC meeting in June, and would place the matters Andrews noted on the agenda. He stated: "I do not feel that the FEMA-NSC statement of a 2-5 percent annual probability of a major earthquake in southern California warrants a full 'evaluation' by the Council, but I hope that a defense of this prognostication can be given to the Council and that we will have a chance to discuss it and perhaps offer personal opinions. . . . I do not consider this [the FEMA-NSC

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Letter, Richard Andrews to Clarence Allen, February 9, 1982.

probabilistic statement] a true prediction in the meaning of the word intended by the Council."71

In July, NEPEC met. The 2-5 percent prediction or probabilistic statement was discussed. USGS members on NEPEC, who had in large part been responsible for the 2-5 percent statement, held to their view that they were right on this, but NEPEC did not go beyond general discussion. The decision on terminology was that USGS should decide, not NEPEC.

Andrews was frustrated with what he regarded as non-helpfulness on Allen's part. Allen was less than enthusiastic about SCEPP and its effort to push NEPEC to take positions he regarded as unwarranted.

Andrews was disappointed with CEPEC also. CEPEC was headed by Davis, a member of PAB. However, Davis was one among a number of scientist-members. The decision here was that an endorsement on terminology was a national decision--not a California decision, and CEPEC should not judge a federal report. In other words, CEPEC regarded NEPEC as the right place to go. Andrews had gone, and come back empty handed.

Andrews now pushed USGS to consider the terminology. USGS also was slow to respond. John Filson, the director of the USGS earthquake program, had been at Asilomar and was generally sympathetic with what SCEPP was trying to do. But he had many other problems with which to cope, and a national constituency of scientific researchers who thought too much money was already being spent in California. Also, his overall program budget had been cut considerably by the Reagan administration.

The big issue for USGS was not terminology. The issue was "readiness" for deployment of an operational (i.e., Tokai-like) system on the south-central San Andreas fault. This would cost a

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Letter, Clarence Allen to Richard Andrews, April 18, 1982.

great deal of money. In Japan, the priority of earthquakes was such that money was spent in significant amounts on both R&D and an operational prediction system. In the U.S., with a much smaller pie to divide, it was another matter. There was little sentiment within USGS to take diminishing resources from research and apply them on a crash basis to set up a range of devices to detect precursors that might not ever come. Andrews understood these sentiments, and was sympathetic to them. In a speech before the American Seismological Society on April 20, 1982, Andrews argued that both kinds of systems were needed.⁷² But USGS was wary of the operational route, and so were all the scientists doing research, under USGS, in California and elsewhere.

On April 6-8, Filson held a workshop at Asilomar to review the USGS Earthquake Hazards Reduction Program. Various views on the program were discussed by the USGS officials and researchers who were present. Andrews was at this meeting and had the opportunity to state his perspective. On May 14, Filson circulated minutes of the workshop and a draft five-year plan. With respect to earthquake prediction, USGS was intending to move cautiously forward. The following strategy was stated:

Develop earthquake prediction methods to provide a rational basis for estimates of increased earthquake potential. Evaluate in probabilistic terms the relevance of various geophysical, geochemical, and hydrological data to increased earthquake potential.⁷³

The plan also called for the first step toward an operational earthquake prediction network. The strategy was:

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Richard Andrews, "Earthquake Prediction and Preparedness in Southern California: Science and Public Policy," presented at the 1982 Annual Meeting of the Seismological Society of America, April 20, 1982.

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John R. Filson, Memorandum to participants of the workshop to review the USGS Earthquake Hazards Reduction Program, May 14, 1982.

Specification and design of an operational earthquake prediction network.

Site evaluation and selection.

Development of data management principles and techniques.

Installation and operation of an earthquake prediction monitoring system.

The plan stated that progress required USGS to "concentrate our major observational efforts in a few regions with dimensions measured in tens of kilometers. The strategy of concentration of observational effort is followed in Japan and the Soviet Union."

How much impact the SCEPP Asilomar meeting had on this strategy and how much it reinforced what Filson already wanted to do is impossible to say. But he obviously was moving in tandem with SCEPP, at least in terms of intent. The major problem was that USGS had only \$15.4 million for earthquake prediction at this time, and that was hopelessly inadequate. Also, as noted, there was resistance among scientists inside and outside USGS to concentrating resources in California more than they already were. Finally, the operational system was regarded as a possible threat by most of the researchers, including those in USGS. USGS might march forward, but it would do so very, very slowly, and with difficulty every step of the way.

Like NEPEC and CEPEC, USGS was, therefore, a source of frustration for SCEPP. What Andrews--who made this aspect of SCEPP's work a personal enterprise--was finding was that scientists might be harder to bring aboard a coalition for preparedness innovation in California than any other single group. This was underlined as the draft report on the Japan trip was written and circulated for comment in the spring and summer of 1982. The seismologist on SSC, Bolt, was not as optimistic as Andrews, and others who had gone to Japan, about the transferability of the Tokai experience to America. In many ways, he shared Allen's skepticism concerning the viability of a strong push for earthquake prediction based on the Japanese model. He was certainly in favor of prediction, but he did not want a report coming out under SSC auspices suggesting more was possible

than he believed was scientifically valid. The fault system of California (as well as paucity of historical data) made it more difficult to predict a Californian than Tokai earthquake. He therefore stressed caution, whereas SCEPP felt advocacy was essential to get earthquake prediction R&D and operations moving in this country. Otherwise, SCEPP would be helping city, county, and private partners plan for a prediction that would never come.

Andrews wanted the report to call for a focusing of research efforts more precisely on the southern San Andreas. He wanted to develop real-time operational monitoring systems. He wanted changes in the structure and function of the California and National Earthquake Prediction Evaluation Councils--all with an aim to shift from a reactive to proactive prediction mode in the manner of the Japanese. Bolt opposed such changes. His view was that the technology of prediction was not present and hence there was no compelling reason to alter the existing system. That is, the research effort should not be concentrated on a particular fault, money should not be poured into an operational system, and CEPEC and NEPEC were doing a good job, relative to the present need. He favored continuity, whereas Andrews wanted change.

Others were drawn into this discussion, in one way or another, including Burts (who favored the Andrews position), Richard Jahns, a geology professor (who agreed with Bolt), Scott (who leaned somewhat toward Bolt), and Olson, who played a negotiating role. After months of going around on this issue with SSC, SCEPP published the Japan report in October 1982. The tone of the report was indeed modified from the original SCEPP intent. It carried the general message SCEPP wanted. However, it was pointed out prior to listing the recommendations that there was "substantial uncertainty within the earth science community about the likelihood, in the foreseeable future, of identifying short-term indicators of a possible impending earthquake," and, hence, there were those who believed it "premature to undertake extensive preparedness plans based on the assumption that a short-term warning will be used." It declared:

The [SCEPP] research team members recognize that the recommendations for the development of an operational prediction system and the establishment of a small panel of scientists to monitor data from the instrumental network are long-range objectives. Also, not all reviewers believe extensive changes are needed in the structure and operation of the existing California and National Earthquake Prediction Evaluation Council.⁷⁴

Thus, the force of the recommendations was softened, although they were in fact still made. Also, the original intent had been to focus the call for an operational prediction system on southern California. In recognition of the fact that SSC had an all-California constituency, this southern California emphasis gave way to a call for "prediction of a catastrophic California earthquake."⁷⁵

Thus, the scientific side of SCEPP's work was proving most "unmanageable." SCEPP's mission was prediction/preparedness. It was finding its leverage in getting change on prediction policy was slight indeed. It was nibbling at an elephantine issue. But it was nibbling.

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SCEPP, Japanese Earthquake Prediction/Preparedness Program, October 1982, p. 2.

75

Ibid., p. 3.

F. A SHIFT IN LEADERSHIP

During early summer 1982, Olson made it known that he wished to step down as director of SSC. Andrews indicated that he wanted the Olson job. One of the reasons he wanted it was his concern for the project. SCEPP was still vulnerable. It needed support from SSC. Who could provide better support from SSC than he? SSC performed a modest search, but Andrews had the inside-track for various reasons, the most important being his knowledge of SSC's most important activity--SCEPP. Also, he had won widespread admiration for bringing SCEPP back from the brink following the Ledbetter firing. The only negative point made about him was whether he had sufficiently groomed his heir apparent, Flores, for the job. Andrews said he had, but there were those on SSC and PAB who had doubts. There was some feeling that having any turnover in directorship of SCEPP at this point was bad. One of the unwritten agreements attendant to Andrews' selection was that he would continue to play a strong role vis-a-vis SCEPP.

Exactly what that role would be remained to be seen, however. It was up to Andrews and Flores to define their division of labor. But they knew one another well, and were sufficiently complementary in style that they were not overt threats to one another. Hence, Flores did not have as much autonomy vis-a-vis Andrews as he would have liked, and he was sensitive to that fact. Andrews took pains to explain that when he took over from Ledbetter, he too was monitored closely by Olson. Gradually, relations were sorted out. Flores had particular leeway when he was implementing planning partnerships. The area Andrews charted out for himself was external policy relations (e.g., between SCEPP and FEMA or OES). And there was much to do. The work nurtured under Andrews had to be completed. This meant making sure actual prototype "products" came out of the novel processes that had been set in motion. Flores set his sights on that task, and hoped that Andrews, on the policy front, would help him by getting SCEPP more time to complete what had been started. Flores needed time, because SCEPP was approximately one

year behind schedule owing to the difficulty in finding a first director, and then terminating that director.

Now SCEPP had a third director, but the organization was reasonably mature. In addition, it had a \$250,000 supplemental from FEMA that came at the end of the fiscal year in September, for educational materials. Also, the message was passed to SCEPP in October 1982 that it was the intent of FEMA Region IX to "finance the SCEPP project through September 1983 and to support the institutionalization of the SCEPP concept and capabilities through FY 1984."⁷⁶ This meant that the federal government would keep SCEPP alive beyond June 30, 1983. It meant it would also work to "institutionalize" some of SCEPP's ideas and capabilities. Exactly what this latter point meant, and how SCEPP would fit in, were not clear.

The situation became even less clear on November 12, when Vickers testified to the Joint Committee on Fire, Police, Emergency and Disaster Services of the California legislature. He discussed giving federal funds to the OES to initiate an earthquake preparedness effort for San Francisco. He stated that one agency should be given the responsibility to coordinate all state emergency activities. These remarks sent a shudder through SSC and SCEPP. They indicated that the federal government might be favoring OES in any future plans to work with California and build on the SCEPP experience.⁷⁷

What made the remarks from federal FEMA's Region IX director all the more upsetting was the fact that they were coming at a time when state government support was of concern. This fact arose from the surprising defeat of Mayor Bradley in the November 1982 race for governor of California. Jerry Brown had run for the Senate

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Letter, Paul Flores to PAB, January 18, 1983.

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Robert L. Vickers, Testimony, The Joint Committee on Fire, Police, Emergency, and Disaster Services, California Legislature, November 12, 1982.

(unsuccessfully) and Bradley had vied with George Deukmejian to be his successor. Bradley's election would have virtually guaranteed strong support to SSC and earthquake preparedness, via Burts. But with Bradley being defeated, an unknown quantity--Deukmejian--was coming into the lives of California's earstwhile earthquake entrepreneurs.

A final note of concern, not so immediate in the sense of Vickers and Deukmejian, was the loss of Senator Harrison Schmidt from the Senate. Schmidt was a potential ally of SCEPP in getting USGS to play a greater role in predicting the great California quake. An astronaut with a Ph.D. in geology, he forcefully pushed USGS to think more optimistically and boldly about prediction. He had wanted USGS to begin planning for an operational system aimed at predicting. Largely at his behest, USGS was going to do so. The only really good news from the election for earthquake supporters was that George Brown had won. Overall, however, there was the perception of a net loss in earthquake support.

G. FLORES TAKES OVER AND IMPLEMENTATION PROCEEDS

In October 1982, while Andrews was getting settled in his new job in Sacramento, Flores was adjusting to the leadership role of SCEPP. He made few internal organizational changes. SCEPP was now a stable organization. Najera became de facto second in command. Flores saw his job as that to finish what SCEPP had started, particularly in terms of the four planning partners. Gradually, he put his own stamp on the organization, changing the emphasis ever so slightly from Andrews' prediction/preparedness orientation to one favoring comprehensive planning. What this meant was more attention before the event to response and recovery. He also wanted to bring about more uniformity among the planning partner plans. To get away from Ledbetter's "push" strategy, Andrews had leaned far toward a "pull" approach (i.e., partner driven). Ultimately, thought Flores, there had to be a regional response to a regional event. There thus had to be more emphasis by SCEPP on coherence among the planning partner actions.

He thus tilted back to the Ledbetter approach, but not as far, and without the tableau. As when Andrews replaced Ledbetter and narrowed SCEPP's role, so, with a broadening of role by Flores, there was no "big decision." It was a day-to-day change in behavior, one reflecting not only what Flores brought to the job (a planning background) but also the circumstances of the time. Prediction was "down," and the event itself was "up" where the users were concerned. Flores had been spending most of his time, as number two man, with the users (i.e., partners). He saw the "trees." As number one man, he continued to work with the partners, seeking to comprehend the forest. But this would take more time than he had left.

Flores inherited four planning partnerships in different stages of implementation.

San Bernardino

San Bernardino was farthest along. Indeed, it was fair to say that in fall 1982, San Bernardino was the dominant party in the partnership with SCEPP. Littlefield had put together a task force of key county departmental representatives and community leaders, including representatives of the City of San Bernardino, San Bernardino Associated Governments (SANBAG), and Norton Air Force Base. The task force had met monthly to give overall direction to the project. Included on the task force were SCEPP staff and the chairpersons of the 13 planning subcommittees.

Thirteen subcommittees had been formed to develop plans for their respective functional areas. These were: county departments; medical; law enforcement; schools; volunteer organizations; utilities; fire, rescue, and hazardous materials; cities; transportation; building hazard mitigation; information and media; Neighborhood Watch; and local businesses. Each subcommittee was chaired by a task force member to provide continuity of effort and coordination. The subcommittee approach gave a comprehensive overview of earthquake preparedness for all sectors of the county, including public, private and business-commercial. The various subcommittees addressed similar contingencies: (1) long-term prediction (1-3 years); (2) short-term prediction (1-7 days); (3) immediate response (first 72 hours); and (4) short-term recovery. They dealt with people, structures, critical resources, communication systems, utility systems, and hazardous facilities. They met monthly, separately and jointly, as necessary.

During the fall, whatever functional plans that were not complete were finished and cross-checked for compatibility. Various test exercises were also carried out, including a state OES southern California earthquake exercise. In December, the final report was prepared as the planning partners' contribution to SCEPP.

An earthquake contingency plan would now be integrated into the county overall emergency plan. The report that San Bernardino

produced in December 1982 looked very much like an emergency services manual. But it was a "product"--something both San Bernardino and SCEPP could point to in showing accomplishment. The Board of Supervisors formally accepted two thick volumes of plans for county response on December 20, both to an actual earthquake and to an earthquake prediction--in anticipation of the day that valid predictions could be made.

The Board of Supervisors, in accepting the plan, directed the staff to take continued steps in 1983. Those steps included publication of the emergency plan, ongoing education and training for earthquake response in coordination with cities and industries, work shops to spread word of the plan and continued long-range planning for earthquakes.⁷⁸

SCEPP, meanwhile, now had a set of products, out of San Bernardino. These had to be evaluated and perhaps changed to be made transferable. The San Bernardino final report was a 600 page document. SCEPP began working to change it into an 85 page report intended primarily for a chief administrative officer of a county, rather than for various line agencies concerned more with detail.

A "peer review" committee was set up in February and March by Flores to provide guidance in this adaptation as well as look at other products coming out of San Bernardino. The committee consisted of representatives from state OES, Los Angeles County, the SCEPP PAB, the Red Cross, San Bernardino County, a consultant (Terry Haney), and Flores. It began meeting monthly. Since San Bernardino was the first partner, it would be used as a test case in developing a strategy for transfer.

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Don Green, "County Takes Lead in Southland Earthquake Preparedness Plan," Ontario, California Daily Report, December 21, 1982.

Westminster

One of the first places lessons learned from San Bernardino were used was Westminster. The MOU with Westminster was concluded with Givin, Andrews, and the mayor on September 21, 1982. In October, under Flores, work ensued to implement the agreement. On November 18, there was the kick-off meeting of the Westminster partnership. An Earthquake Preparedness Coordinating Committee was set up from among the various city departments with interests in the field. This committee, in turn, organized seven functional subcommittees (e.g., hazard mitigation, school safety, business community preparedness, etc.). Planning and preparation would be organized in terms of the same framework used in San Bernardino (long-term prediction, short-term prediction, immediate emergency response, and short-term recovery).

The Westminster partnership was proving to be in some sense an adaptation of what had been adopted in San Bernardino. A number of functional subcommittees were appointed and they met monthly. Each subcommittee chairman served on an overall coordinating committee. A check list of tasks to be accomplished was prepared and each subcommittee addressed each item. Once completed, these were translated by SCEPP into a functional plan. Short- and long-term predictions were dealt with.

Cheryl Tateishi ran the Westminster program on SCEPP's behalf. Various other SCEPP staff were assigned to the subcommittees as necessary. SCEPP played a greater leadership role in Westminster than in San Bernardino, a circumstance attributable to the fact that Westminster was a small city with limited resources to apply to this effort. However, in Westminster, SCEPP did have a committed partner.

Although there were some delays, by April 1983, the Westminster project was 75 percent complete. By June, all six subcommittees had completed their four-phased earthquake prediction, response, and

recovery plans and had submitted them to the coordinating committee for review.⁷⁹

Security Pacific

Flores also saw to continued progress with Security Pacific along the lines previously worked out. The key decision involving Security Pacific occurred in November 1982. Here, as in San Bernardino, SCEPP was able to help a partner which was taking the lead in moving action forward. Jacob and Himel knew that they could get nowhere in Security Pacific without top management support expressed in a visible, tangible way. This meant adoption of an earthquake policy by Security Pacific.

The existing policy--a set of corporate by-laws--dealt with nuclear disasters. Since bank executives generally felt there was little anyone could do in a nuclear disaster anyway, there was a sense of unreality about existing "policy." What was needed, in the view of Jacob and Himel, was a new policy concerning earthquakes that would legitimate resources for: (1) employee education; (2) communications; (3) transportation; (4) vital records preservation; (5) other required equipment; and (6) miscellaneous matters such as an alternative headquarters.

Key was the commitment of the two individuals immediately superior to Himel and Jacob. Having a lawyer assigned to help them draft revisions was an essential element of the help they received. Ultimately, they went to speak with George Moody, the president. Moody was on the National Board of Directors of the Red Cross, so he was sensitive to the issues involved. On the other hand, a bank is a business, and the two earthquake entrepreneurs were fully realistic about the fact they were asking the bank to make a commitment of resources for an activity that would not generate income, that would in fact cost money.

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Memo, Cheryl Tateishi to PAB, June 13, 1983.

In November 1982, when they spoke with Moody, he asked how much would it cost? Jacob responded: "six figures." Moody decided that the investment was worthwhile. Shortly thereafter, he made a presentation to the bank's Board of Directors regarding the need for greater earthquake preparedness and thus a change in bank policy supporting necessary activity. The board concurred that the earthquake problem was one that had to be addressed, and that the by-laws should be changed to define emergency in such a way as to include preparedness for a major earthquake.

Now Himel and Jacob had to prepare a program and think about costs in detail. There was the existing committee, including representatives of various bank departments and they contributed ideas. However, the motivation had to continue to come from Himel and Jacob, as they were aided and abetted by SCEPP.

The SCEPP agreement called for "guidelines"--a set of plans for action by a high rise bank that could serve as a prototype for similar entities. In the process of doing the guidelines, Himel and Jacob learned a great deal themselves. They also decided not to go after a "program" and budget for the program all at once. They decided it was better to go at preparedness in stages, incrementally, and hope that "the big one" would not come while they were gradually moving ahead. Funds were bootlegged from various accounts since there was, in the first half of 1983, no "earthquake preparedness" budget as such.

Some of the areas in which SCEPP and Security Pacific were working in early 1983 were: training, storage of vital records, planning for management successions, off-site locations, and various kinds of contingency plans. There was also a study involving non-structural damage within the bank. On April 19, SCEPP completed a report on "Reducing the Risks of Nonstructural Earthquake Damage: A Practical Guide" that was, in large part, a result of its work with Security Pacific.

The Coalinga earthquake of May 2, served to spur preparedness concern in Security Pacific as well as in most other planning partners. For Security Pacific, it emphasized the need to think about contingency planning for the bank as a whole, in terms of data processing needs. That is, it was not enough to plan just for Security Pacific headquarters. Planning had to involve the Security Pacific "system" with its multiple branches. A branch bank in Coalinga had been demolished, causing no real problem for the bank as a whole. But if Security Pacific headquarters in downtown Los Angeles were incapacitated, the entire system could be in deep trouble.

In June 1983, a major decision was made by Security Pacific. This was a reorganization that created a Corporate Security Department. Debbie Jacob became the senior vice-president in charge, with Himel working within her department. Security included a great deal--but it certainly included earthquakes if Jacob and Himel were involved. Jacob reported directly to chief executive officer Moody. For the first time, earthquake contingency planning was able to have a budget of its own. The reorganization and the bank's new fiscal year occurred at the same time. However, in terms of "big money" preparedness items, such as bolting down all desks and tables, and making other major nonstructural changes, the decision was to go slowly.

Los Angeles

Flores' biggest headache was the same one that had bothered Andrews: Los Angeles. As Flores took over in October 1982, activity got also under way on the Los Angeles MOU. A recent addition to the SCEPP staff, Paula Schulz, was the principal whose task it was to make this most critical partnership a reality. Schulz came to SCEPP via the Association of Bay Area Governments (ABAG), a council of local governments that had given great attention to seismic matters in the San Francisco region.

On November 9, Flores and Schulz met with the coordinating committee established by Los Angeles to provide overall guidance for the planning partnership. The committee was comprised of representatives from the following: police, fire, public works, building and safety, general services, office of city attorney, planning, city administrative office, chief legislative analyst's office, and mayor's office. Among those present were the individuals who had played lead roles in representing city interests (Morrison and Mattingly). Burts was not present, an absence that was not accidental. He wanted to withdraw and let others take the lead on behalf of the city.

This was a general "kick-off" meeting. It was also late in the game for accomplishing anything if the June 30, 1983, termination date for SCEPP remained fixed. SCEPP asked that the city establish five subcommittees and coordinate research that was a follow-up to the consensus report. Most of the discussion concerned the prediction response planning subcommittee. Morrison suggested that all the principals on the coordinating committee be involved and that the subcommittee be chaired by a representative of the chief legislative analyst's office or the mayor's office. Mattingly also voiced the opinion that the main job of the coordinating committee would focus on prediction response.⁸⁰ Later, after the meeting, Burts spoke to both SCEPP and city staff, and concluded that there was progress taking place.

SCEPP went about its business, with a minimum of contact with Los Angeles officials. SCEPP regarded its role as that of pursuing answers to specific concerns laid out in the memo. This included answering questions of local government's liability in connection with a prediction or event itself. Another question concerned whether there would be federal assistance for disaster preparedness prior to the event, but after prediction.

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Minutes, City of Los Angeles Planning Partnership Coordinating Committee Meeting, November 9, 1982.

The Los Angeles administrative people generally went their way, and SCEPP went theirs. Communication broke down. This was in part because SCEPP felt Los Angeles did not wish to be bothered. What contacts there were that were reasonably close were informal rather than within the partnership. For example, SCEPP helped staff the International Earthquake Conference that took place February 7-11, 1982. As noted, this had been generated by City Councilman Hal Bernson, but involved Morrison, Mattingly, and others. Like Andrews, Flores found he could relate well to Morrison in these less formal kinds of circumstances.

For his part, Morrison found Flores a reasonable individual who was someone with whom he could work. Morrison was a thoughtful, but quite practical police executive. Perhaps even more than Mattingly, he had been disenchanted by his initial encounter with SCEPP. He had begun to change his mind with Andrews. He found Flores, with his local government experience, a practical planner with whom he could deal.

On March 22, SCEPP gave the city a packet explaining what it was doing. It quickly became clear that there were some problems. In April, Morrison visited Flores to express the city's dissatisfaction with the level of interaction it enjoyed with SCEPP. He indicated that the Emergency Operations Board--an interagency committee that was the highest ranking policy body in Los Angeles in the emergency management field--was going to consider, at its next meeting, whether to request the mayor to charge SCEPP for non-compliance on the MOU with the city. The issue was basically that SCEPP needed structured meetings to communicate with the line managers as well as the political people.

A few days later, on April 18, the Emergency Operations Board meeting took place. Prior to this meeting, Flores, Burts and Mattingly met and came up with measures to assure better interactions. SCEPP came into the meeting with a list of "corrective measures" it would take to improve communications. The board liked what Flores had to say. Burts was unable to come to the April 18

meeting so Mattingly stated his position for him. The position was that he had confidence SCEPP would meet its obligations by the June 30 deadline. Also, he felt this was not the time to interrupt the partnership and evaluate it. Morrison, representing the board's chairman, Daryl Gates, had actually instigated the "compliance" issue. It was seen by SCEPP as a signal of his growing interest in the output of the partnership process. He wanted to make sure SCEPP would keep him and others informed of what it was doing. He did not want a report coming out by SCEPP in June that was not addressing the city's problems, as he saw them. He was particularly concerned with the quality of some of the work he was seeing. "Communication" was thus a means by which the city and he could better assure the useful content of what might be a significant product.

A result of the April meeting was that the Los Angeles coordination committee and various subcommittees began meeting regularly. Joint progress--in the minds of both SCEPP and the city--was now under way. With more communication came more discussions of substance, and even spirited disagreement on certain points. For example, in prediction, SCEPP wanted a two stage prediction process, as was used in San Bernardino: long and short term. (This approach was a transfer from what Japan was doing.) For Los Angeles, two stages were not enough. It wanted an intermediate phase. The reason was that it regarded long term as the present phase southern California was in, and involved the kind of activity with which Los Angeles was now engaged with SCEPP. Intermediate meant an acceleration of this kind of activity, with a greater sense of urgency. Short term meant evacuation. This was the Los Angeles view. It was the view that prevailed, in large part because Burts, as chairman of the prediction subcommittee, sided with the city.

Another disagreement entailed the city's interest in a functional (department by department) approach, and SCEPP's orientation toward an integrated (across the departments) approach. The former approach began with the agency, and the latter with the problem, (e.g., prediction). In this case, the city acquiesced to SCEPP. And, so it went--with give and take on both sides. Along the way,

Morrison suffered an illness and was incapacitated for a time. However, his police department associate, George Knop, was already deeply involved in the exercise, and was able to carry on for him. Even during this time, Morrison maintained telephone contact with Flores.

On June 22, SCEPP presented draft products to the Los Angeles coordinating committee. By June 30, most of what was intended to be done under the MOU was done. A number of studies were completed: a three-phase city prediction response plan; a report documenting SCEPP's coordination with the NSF-funded Pre-Earthquake Planning for Post Earthquake Recovery (PEPPER) project; a report on research dealing with federal disaster assistance, earthquake insurance, and legal liability; recommendations related to small business preparedness; and earthquake preparedness information for the handicapped. What was not finished was the large city prototype plan, but SCEPP made it clear this was coming.

The basic reaction of Los Angeles users to the reports was favorable. There were some disappointments with the work on prediction and liabilities relating thereto. There was a feeling that the small business material was lacking; however, Los Angeles granted that the problems on this front might have had more to do with communications from the city side than weaknesses of SCEPP.

Considering the negative beginning (and awkward middle period) of the relationship, Los Angeles and SCEPP had come a long way. Both sides devoted a great deal of time to the effort near the end. At the outset, the impression SCEPP had given the Los Angeles people was that they should work for it. By the conclusion, SCEPP not only was saying it was working for Los Angeles, but Los Angeles felt it was gaining something from the relationship. On the whole, the materials were deemed useful, and there was surprise and pleasure that SCEPP had accomplished as much as it did, on schedule.

H. COALINGA AND THE SCEPP EXTENSION

While Flores was immersed in completing the partnerships against a short deadline, Andrews was engaged in trying to get SCEPP more time. At the beginning of 1983, with a new governor taking office on January 3, and the state in danger of running a substantial deficit, the future for SCEPP remained perilous. Governor Deukmejian's first move was to cut spending by two percent and to freeze hiring, promotion, transfers, and out-of-state travel.

On January 13, at the SSC monthly meeting, Vickers and Meade reaffirmed that FEMA still wanted to keep SCEPP going--probably for one more year. This would include start-up of a northern California version of SCEPP--the first intrastate transfer of the SCEPP experience. Unfortunately, under FEMA procedures, there would have to be a formal request for proposals and submission of a "bid" by SCEPP to carry out the tasks set by FEMA for the extra year. This was pro forma and a nuisance, but these were the rules; rules apparently not present or applicable when the original SCEPP project was set up. This FEMA process, along with the possibility of no California money, added to the anxiety the SCEPP staff was feeling. Money was running out and prudence suggested some thought to future employment. But FEMA felt it had to go through procedures, and it would begin by developing a statement of work.

It was quite clear that what FEMA wanted was transfer of the SCEPP approach: within the southern California region, outside to northern California, and beyond to other high risk areas of the country. FEMA was under pressure from Congress to show it was fulfilling congressional intent to increase earthquake preparedness throughout the U.S. It was also clear that SCEPP was of the view that transferability efforts outside the region might be premature. It had barely scratched the surface of what had to be done in southern California. This came out at the PAB meeting January 26,

which was attended by Laurie Friedman, a FEMA Region IX representative.⁸¹

Chairman Givin said that the SCEPP effort had to be viewed in stages. The first experimental process was now in the completion phase. This was to develop the prototype plans. The second experiment was to transfer the prototypes to others in the southern California region. The task of transfer to other high risk regions, a third step, was not within the realm of SCEPP responsibility, in Givin's view. He felt that, at this juncture, there was a misconception on FEMA's part that SCEPP had solved the problems and was ready to distribute the solutions.

Flores emphasized that SCEPP had a lot more to do in southern California in terms of regional planning. SCEPP had been working with individual jurisdictions, but there was a need to think about regional linkages since earthquake mitigation planning was a regional problem. It was noted that there appeared to be a "missing link" between state and local planning, as well as a lack of consolidation among the plans of local entities. SCEPP still had to fill the regional planning gap.

The fact that there were differences in perspective with FEMA was important. Also important was the increasing concern SCEPP had that it would not get state "balancing" money. Without the state money, SCEPP might be subject to federal whims. Andrews commented on the state's fiscal situation at the January 26 PAB meeting, pointing out that the prospect of additional state funding was looking highly unlikely.⁸²

On March 10, SSC submitted a legislative package to the governor in which \$300,000 was included for a one year SCEPP extension. The

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Minutes, SCEPP, January 26, 1983.

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Ibid.

chairman of SSC asked PAB members to do what they could to get state level backing for this bill.

On April 11, the Senate Finance Committee met. The hearing on the SSC request went well, as Senator Alquist remained a staunch ally in every respect, including SCEPP. However, it was clear that the administration, at least as represented by the Department of Finance, was opposed to SCEPP. The Assembly counterpart committee would meet shortly thereafter, and could be expected to go along with Alquist rather than the administration position. It seemed that the Republican governor and Democratic legislature were going to have problems agreeing on SCEPP.

SCEPP and FEMA, meanwhile, were also having problems agreeing. One problem was the sheer slowness of the FEMA contracting process. Given staff worries about jobs, this was significant. Substance was also a problem. In the first draft of a work statement that FEMA sent SCEPP, prediction response was dropped altogether in favor of event response. It also did not say anything about SCEPP's interest in working with the private sector and on long-term mitigation. It also said that, at the end of the project, it would be the SCEPP goal to assist OES to become capable of taking over for SCEPP.

In March and April, SCEPP and SSC found themselves at odds with FEMA on these and other matters. Andrews did much of the negotiating, since the agreement was with SSC. However, he fully reflected SCEPP views. The shift on earthquake prediction response and generally narrow perspective revealed the degree to which FEMA was quite a different entity from the FEMA of Chuck Thiel--for whom prediction response and comprehensiveness of approach were essential. Under the new administration, FEMA began to emphasize civil defense as a mission. This ran into opposition. As a consequence, FEMA came up, in 1982, with a program called Integrated Emergency Management System (IEMS). This was a program emphasizing a multi-hazard approach to disaster planning and response. Within IEMS, civil defense might be more palatable to a previously reluctant set of

users. In 1983, FEMA began pushing IEMS harder, and wished to do so, within the states, through the organization that had the civil defense mission. In California, this was OES. Moreover, IEMS required linking all the various emergencies. Earthquakes was seen by FEMA as an essential part of the integrated emergency management system of "its" agency, OES.

The OES-orientation of FEMA was particularly galling to SCEPP. Andrews took the position that FEMA had no business telling a state how to proceed in assigning a particular task. He reminded FEMA, informally, that SSC had been given the job of managing the SCEPP earthquake program because the state legislature did not want it to go to OES.

FEMA relented. By late April, it appeared that SCEPP would get at least \$450,000 from FEMA. The big question now was: what would California do? The governor had made it clear to the legislature that he would exercise his veto power on all nonessential expenditures to keep the budget balanced without raising taxes. Would SCEPP be deemed essential--or simply "nice to have"?

Then, on May 2, came the Coalinga earthquake. Although no deaths took place, 45 people were hospitalized--3 seriously injured. Of a total of 2700 homes in the city: 2000 were partially damaged, 200 destroyed, and 240 severely damaged; 212 businesses were destroyed.⁸³

The media covered the earthquake extensively. It received national as well as state and local attention. Within California, a number of newspapers, including the Los Angeles Times, drew lessons. Said the Times: "Coalinga was yet another alarm bell reminding Californians that their lives are not risk-free. The prudent will act on

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SCEPP, The Coalinga Earthquake: Initial Steps Toward Recovery, May 25, 1983, p. 1.

that warning."⁸⁴ Invariably, the media pointed out the fact that state attention to earthquake preparedness was lacking. "It would seem that preventing death on a mass scale would be a fundamental concern of government," wrote Dan Walters, chief of The Sacramento Union's Capitol Bureau. "But it is difficult to get the politicians who operate government to look beyond the concerns of the moment and devote resources to a problem that may not occur for years or decades. The temptation is to let something as long-term as earthquake preparedness slide, especially when money is tight."⁸⁵

Andrews used the Coalinga event in every way possible to underline to the media the major lesson: "We are not prepared." In interviews and in a special guest column for the Los Angeles Times, Andrews emphasized this point, along with the need for public support to encourage elected officials to allocate additional resources, even at a time of severe financial constraints on government.⁸⁶

Coalinga became a rallying cry for all California representatives in Congress, in the face of a 10 percent funding cutback in the Reagan administration's prospective federal earthquake hazards program. Much of this was put back into the budget.

However, the main battleground was in California. State Senator Alquist voiced his support for all the proposed SSC expenditures, including SCEPP. He pushed for additional funds focused on

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"For Californians, an Alarm Bell," Los Angeles Times, May 4, 1983, Part II, p. 4.

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Dan Walters, "Earthquake Readiness is Shaky," The Sacramento Union, no date.

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Karen Klinger, "Quake's Lesson: We're Not Prepared," San Jose Mercury News, May 8, 1983; Richard Andrews, "Coalinga: The Lessons are Clear," Los Angeles Times, May 10, 1983, Part II, p. 5.

Coalinga. The problem was that Coalinga, important as it was, was a very small and relatively isolated town. No one died from this earthquake. It was a disaster for Coalinga, but not for California. It was not a certainty that the governor would relent.

Finally, on July 22, the governor's decision on SCEPP was made known. It was "yes." The governor approved the state budget. In doing so, he signed off on the appropriation of \$300,000 in state funds to supplement federal funding for the SCEPP extension. Thus, as of July 1983, SCEPP knew it would survive reasonably well for another year with a combination of federal and state money. Significantly, he said "no" on \$130,000 for another SSC earthquake preparedness effort sponsored by SSC--a statewide task force. [The task force is discussed in a separate case.]

The new cooperative agreement between FEMA and SSC would begin July 1, 1983, and provide \$450,000. Major tasks agreed upon included: (1) transfer of SCEPP concepts and products to other high risk regions out of the southern California region; (2) production of a large city prototype plan based on SCEPP work with the city of Los Angeles; (3) establishment of a function for earthquake education and information; (4) follow-up to current SCEPP data base pilot project; and (5) development of a prediction-warning system, taking more forward steps in refining a warning system for the state of California and ensuring such a system is compatible with ongoing planning processes for prediction response.

Thus, SSC would have \$750,000 in new money for SCEPP and the start-up phase of a northern California effort. For SCEPP, there was a feeling of relief. All the SCEPP employees had by this time received termination notices. They knew they would now survive, but the lack of security may have helped cost SCEPP the services of one of its key people--Joan Arias. She resigned, effective June 30, 1983, to join one-time SCEPP director, Carl Ledbetter, now at IBM.

I. SURVIVAL AND TRANSITION

The assumption on the part of SCEPP, PAB, and SSC as of fall 1983, was that all planning and activity had to be geared to finishing what had been started by mid-summer 1984, and products transferred to the appropriate entity to carry on the preparedness effort. To that end, Homer Givin chaired an Ad Hoc Committee on Transferability Strategy of PAB. The Givin committee began meeting in late October.⁸⁷

Within a few weeks, the Givin committee decided that SCEPP should focus its remaining months of work on transfer of its products and processes to other counties in its designated region. There was some thought given to transfer to cities, but SCEPP really did not have the resources or time, in the committee's view, to go that route. Another option was to go to a Council of Governments, a regional entity, but this "cog" was regarded as too weak to accomplish the kind of change SCEPP intended.

The strategy was to begin with a series of conferences in various counties to get the sanction from county board of supervisors. First would be Orange County, in February 1984. Then would come others, such as Los Angeles County, which held an annual conference of emergency management officials. The conference this year would be arranged so as to be devoted to SCEPP. The San Bernardino "model" would be the one that would be transferred in most cases.

While this planning was taking place, FEMA was having second thoughts about the likely demise of SCEPP. It continued to regard SCEPP as one of its most successful programs, yet California obviously was still not fully prepared and it could be argued that the need for a special stimulus remained. However, the nature of that stimulus had to change and become institutionalized. FEMA felt

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The members of the committee were: Homer Givin, Henry Reining, Ezunial Burts, Evar Peterson, Robert Horrigan, and Richard Andrews.

it had to move the program in a new direction, and this would require additional support. The initiative within FEMA came, as before, from Region IX, but reflected a general agency consensus.

On November 21, Givin's ad hoc strategy committee met and regional FEMA officials attended. FEMA indicated that SCEPP should continue beyond July 1, 1984--a statement that pleased the committee; but that OES should play a larger role in running SCEPP after that point--a statement that did not please the group.

At the same time this federal initiative was beginning, another development was unfolding on the state legislative side. Coalinga had spurred the California Assembly's Government Operations Committee into renewed activity on the earthquake front. This committee was the original sponsor of the state bill that had helped establish SCEPP. It had changed in personnel both in terms of chairman and principal staff, but there was awareness of SCEPP and interest in how it was doing. The individual who had the job Joe Lang once held, Parke Terry, began talking with Andrews. From Andrews' point of view, the renewed interest of this committee was important. Not only was it an additional focal point for possible support for SCEPP, but it might even be a vehicle by which SCEPP might be protected from falling too much into the orbit of FEMA-OES. Terry remembered the poor opinion of OES at the time of the original legislation, and was himself favorably disposed toward SSC.

The chairman of the committee, Richard Alatorre, although from Los Angeles, was an unknown quantity in earthquake policy. Coalinga had prompted his taking another look at the California earthquake situation. This included the role of SCEPP, and needed policy for the future. There was no way of knowing how he would come down on the issues. However, there was a definitely new and positive factor in the California environment. Just a year before, when Deukmejian assumed office, all the talk was of deficits and "no new programs." Now, it was realized that California was headed for a surplus. This meant that new programs--or renewed programs--had a reasonable chance of getting through if there was unity among their backers.

The hearing, which took place November 29, 1983, was focused on prediction, preparedness, recovery, and the role of SCEPP. Among those who testified were Davis, Clarence Allen (CalTech), Karen McNally (U.C. Santa Cruz), James Dieterich (USGS), Andrews, William Medigovich (the Deukmejian appointee as new head of OES), Flores, Vickers, and others.⁸⁸ The general view presented was that there was progress in preparedness activity in California, thanks in large part to SCEPP. Prediction remained an elusive hope. Scientists indicated that long-term prediction was coming along, but short-term prediction was moving slower than originally expected. There was progress, but it was very difficult. Intermediate prediction was seen as possibly more likely than short term. Hence, SCEPP's role in prediction response remained important, but that role had to be geared to an uncertain technology. This made preparing for the unpredicted quake all the more significant.

Andrews stated that there was a need to continue SCEPP to: (1) apply the plans it had developed in southern California; (2) further regional planning; (3) develop more intensive work with the private sector; and (4) integrate local, state, and federal plans. He declared that state funds needed to be committed to state preparedness planning so that the state would not be totally dependent on the federal government. In testifying on SCEPP's effectiveness, Andrews made available to members of the committee a copy of a recent public opinion poll which had indicated "that there had been a marked increase in public recognition of the inevitability of a large, damaging earthquake in California and, most importantly, a growing recognition that there are significant actions that can be taken to reduce losses at the time of an earthquake."⁸⁹

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See California Assembly Committee on Governmental Organization, Transcript of Proceedings, Earthquake Prediction, Preparedness, and Recovery, November 29, 1983.

89

Ibid., p. 51

Medigovich seconded the Andrews' view as to SCEPP's effectiveness and that it should be continued. He pointed out that as SCEPP moved from developing to implementing plans, it was moving into the role occupied by OES. He saw OES and SSC working together in implementation--"marching hand in hand."⁹⁰

The testimony of Flores seemed especially influential with Alatorre. It came approximately midway through the hearings. Flores had replied affirmatively to Alatorre's concern regarding whether SCEPP had improved preparedness. He then stated:

Regarding your second question, as a result of the project is Southern California now prepared adequately for a catastrophic earthquake? If not, what additional steps should the state government take? Southern California I don't think is yet prepared for a catastrophic earthquake.⁹¹

Alatorre then asked: "How far away are we?" Flores then explained that SCEPP would, from January to June 1984, disseminate various products it had developed to additional users as well as provide technical assistance to have those applied. Alatorre, for the first time in the hearings, began indicating a policy position. Flores was saying that having developed "tools," SCEPP now had to disseminate them. Alatorre responded: "six months is not adequate." But what was the right amount of time? Noting that "we probably will never be fully prepared," Alatorre pressed Flores for "a realistic time frame for the dissemination of 'the tools.'" Flores responded: ". . . two to three more years."⁹²

From this point on, with Flores and successive witnesses, the tone of the hearings reflected what appeared to be a decision of the

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Ibid., p. 68

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Ibid., p. 61

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Ibid., pp. 61-62.

chairman to continue SCEPP for "two or three more years." The issue now was not "whether," but, what would be done with the extra time, how much money would be involved, from what sources would it come, and the need to move swiftly with legislation. Finally, Alatorre made his view explicit: ". . . I'd be very interested in carrying the legislation and continuing the program." He then inquired of Vickers whether the federal government would provide at least a match for state funds. Vickers indicated that was likely.⁹³ He asked Medigovich whether the governor would approve legislation extending SCEPP, if Alatorre moved it forward. Medigovich responded: "Yes, absolutely."⁹⁴ The hearings continued, but policy decision had been made--or, at least, was in the making.

In the next few weeks there was considerable activity regarding the future of SCEPP beyond July 1, 1984. The activity was paced by the deadline for legislation imposed by Alatorre. He wanted to introduce a bill to continue SCEPP in early January. Alatorre's staff was in close contact with Andrews and Vince Montane, principal aide to Senator Alquist. There was anticipation that a competing bill might be drafted by OES and the governor's office. The central question was one of control over SCEPP--SSC versus OES. It is noteworthy that no one was really evaluating SCEPP in any systematic way. The evaluation was impressionistic, but the impression was extremely strong that SCEPP was a "success." The dominant view was that it had helped move California forward. At the same time, there still was a long way to go, and SCEPP was still needed. FEMA believed this, Alatorre believed this, and, now, so did OES. SCEPP itself, PAB, and Andrews were also of this view. There was consensus as to need for SCEPP, not as to who should run it after July 1, 1984.

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Ibid., p. 75.

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Ibid., p. 76

On the side of OES were FEMA and the governor. Favoring SSC were the legislature and SCEPP itself. The problem was that while OES and its allies were actively moving to control SCEPP, SSC was actually ambivalent. This ambivalence became obvious on December 9, when SSC met, with Flores in attendance, to consider its position on SCEPP's continuation.⁹⁵ It was clear that there were two basic philosophical positions represented among the commissioners with respect to the role of SSC vis-a-vis SCEPP. One position could be termed the expansionist; the other, the conservative. The conservative position held that the customary role of SSC, which was to provide advice and analysis to the legislature and executive branch concerning earthquake safety, was the right role for SSC. The fact that SSC had taken on SCEPP was an aberration. SSC was seen as unorganized and staffed appropriately to run large action projects. If SSC was going to take on SCEPP as a continuing and possibly enlarged effort, SSC itself had to be transformed. The commissioners should become full-time employees rather than part-time volunteers, and be paid accordingly. SSC, if it wanted to run programs in the manner of OES, would have to become more like a traditional line agency. This conservative position was articulated most strongly by Bruce Bolt, who regarded the traditional role of SSC as sound, and one that was in danger of being overwhelmed by the increased identification of SSC with SCEPP.

The other, expansionist view, held that the nature of the problem of earthquake preparedness required SSC to continue to play a larger role because OES remained a problem, in spite of the possibly fine intentions of Medigovich. The basic institutional weaknesses of OES had not been solved. OES was still geared to reacting to events, rather than planning for their mitigation. SSC had a responsibility to California and to the SCEPP staff to protect SCEPP and what it represented. Andrews was especially sensitive to the danger to SCEPP staff. He pointed out that forcing a transfer of SCEPP to OES might mean losing the SCEPP staff in the process. Givin also held

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Minutes, SSC, December 9, 1983.

this view, as did Burts. Burts went so far as to predict that transferring SCEPP to OES would mean the project would be dead within a year. The nature of the styles of the two organizations were simply too different. He felt it was important to keep up the momentum, but not under OES. The discussion went on and on. Rigney gave his perspective, which was that local government would not have cooperated with SCEPP had it been under OES control. He pointed out his view that, for local governments, preparedness meant land use planning, local control, power, and discretionary authority. These were areas where OES might prove interventionist.

But Bolt came back again to raise the issue of whether SCEPP was driving SSC, or SSC, SCEPP. The discussion brought out the point that, with the first extension, SCEPP was already evolving into an operation with a northern California branch and that it was not unthinkable that it could become an all-California activity. While this was not necessarily bad, was this what SSC was all about? Andrews himself noted that the SCEPP situation was at a turning point. What it was doing up to July 1, 1984, could be construed as mainly research and development. But after this point, the work would be to apply and diffuse the products on a much larger scale. This meant SCEPP was moving into operations, and could be in direct competition with what OES was supposed to be doing.

Most of the commissioners said little, but most of them tended to agree with the conservative view of Bolt--namely, this was a good time to get out from under the running of big projects--especially projects moving from R&D to operations. Of course, there were those who felt the distinction between R&D and operations was a bit forced, that the process was more gradual, and, hence, a gradualist approach to divestment would be needed, if only to guarantee that Flores and others working for SCEPP did not resign on the spot.

The meeting made it clear that SSC was pro-SCEPP and wanted it to continue. However, it was hardly in a position, given the spectrum of opinion among commissioners, to wage a hard bureaucratic fight for control. Andrews, who would have to wage the struggle if one

were to come, concluded afterward that the gradualist strategy was the only one viable under the circumstances. The SCEPP staff had to be saved, but there was no denying the clout OES now had under Deukmejian. Medigovich, unlike his predecessor, was close to the governor, or at least perceived as close.

There was also another factor. SSC had a sunset clause in its legislative mandate. Andrews was submitting legislation that would have removed the termination date for SSC, making it a permanent agency. There was the sense that SSC might risk its own future--it had just two more years to go before sunset--if it pushed too hard to maintain control of SCEPP. No one knew whether OES would use this counter if it had to. After all, the governor had other ways to influence SSC, such as through appointments of commissioners. The SSC hope was that Medigovich would not engage in "hard ball" politics, since SSC was not at all sure it was in any position (or mood) to play hard ball itself.

In the next few weeks, therefore, Andrews, Givin, and Medigovich had "frank exchanges." Medigovich turned out to be remarkably supportive. At one point, he went to Givin and said that he knew he had to work to strengthen OES. He was asking the governor for the resources (money and positions) to move his agency forward. He displayed a candor and flexibility that surprised Givin. Medigovich wanted his agency to lead in emergency preparedness, and this goal could be facilitated by SCEPP. He did not want to lose the "innovators" on the SCEPP staff. (The bargaining chips were not only with OES.)

On December 14, a meeting of "all interested parties" took place at SCEPP. Represented were PAB, SSC, OES, and FEMA Region IX. Once again, the discussions were open and candid, but also cooperative. All agreed on the basic point: SCEPP must continue.

Later that day, a regular meeting of PAB took place. Medigovich and Vickers attended. Medigovich praised Andrews, SSC, and PAB for helping to make SCEPP the success it was. He termed the morning

meeting as evidencing a frank discussion of mutual goals. His view was that the goals be "functional."⁹⁶

Vickers seconded Medigovich's comments. He pointed out that FEMA regarded SCEPP as important to its fulfilling its congressional mandate, and that Congress was vocal on the issue of FEMA's responsibility under the Earthquake Hazards Reduction Act. He noted SCEPP had a good reputation with Congress and the national FEMA office. He said he would be "surprised" if funds to continue SCEPP did not come. He also noted that the mission of SCEPP could be expanded to include the IEMS.⁹⁷

Terry Meade commented that the process of transference was more complex than generally realized, and now the question was how do you move from a temporary group like SCEPP to something more permanent?

Andrews stated that July 1, 1984, would likely be the transition point, and that SSC did not necessarily have to remain the permanent administrator.

There was thus no question that thinking was under way for SCEPP's transition. Davis summed up the situation succinctly, as reported in PAB minutes.

SCEPP has essentially been a pilot project to demonstrate an approach, identify problems, work with local governments, and devise ways to deal with those problems. The demonstration, in his view, has been a success. Davis feels we are now moving into a phase of achieving seismic safety in a manner that is substantially different and has never been done. If SCEPP is to continue, he felt strongly that its charge should be very specific in its

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PAB Minutes, December 14, 1983.

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The mention of Integrated Emergency Management System (IEMS) was new, at least in terms of public statement, in connection with SCEPP. It was no secret, however, that FEMA was pushing this program harder than ever, and felt it had to have an ally at the state bureaucratic level, and this meant OES.

scope, and that this scope should be defined very early on, not only in the task but in philosophy.⁹⁸

With this view, there was general agreement among those present.

J. INTRA-STATE TRANSFER BEGINS: THE BAY AREA EARTHQUAKE STUDY

In July 1983, \$300,000 from the state was allocated to continue SCEPP. An additional \$450,000 from FEMA came in September. Most of this FEMA money (\$300,000) was earmarked for the start-up of what it originally called the northern California project.

However, it was not called the northern California project when it began. That decision was made by Andrews, much to the chagrin of FEMA Regional Administrator Vickers. Instead, it was called the Bay Area Earthquake Study (BAES). A study symbolized the fact that before there was to be project outreach activity, there would first be planning. BAES was scheduled to run nine months. The funds were solely federal.

Heading BAES was Richard Eisner. Eisner was a young architect/urban planner who had at one point taught earthquake issues and design. He had worked for Chris Arnold, an architectural consultant and researcher, as a planner, and was involved in an NSF-sponsored Oakland/Yokohama project that dealt with earthquake planning in two cities. Eisner was professionally qualified and knew the Bay Area. It was in June 1983 that Andrews called him to discuss a possible position. Eisner liked the idea of getting into an action project, and decided to accept the position in July. Funds became available September 29, and Eisner went to work in October--in office space leased from the Association of Bay Area Governments in the Hotel Claremont, Berkeley.

The organizational arrangement was such that SSC was acting as lead agency for the nine-month BAES. Two other state agencies--OES and the Division of Mines and Geology--would be participating with the Commission in carrying out this preliminary study; one of the principal purposes being to develop a work plan for a five-year comprehensive earthquake preparedness effort in the Bay Area.

FEMA Region IX was unhappy with the "study" notion because Vickers felt SCEPP had done all the studying already. His view was that the issue was one of transfer of SCEPP materials from southern to northern California. To some extent, Flores also saw the SCEPP materials as transferable. Eisner did not see the issue that way. His position was that you could not directly transfer the SCEPP material technically or politically. It was going to be difficult to transfer material within southern California, much less from southern California to northern California. First, he believed, there had to be a structure. Then, there had to be a political constituency for the materials. Eisner had had some preliminary discussions with officials from the nine-county Bay Area region. It was clear to him that it was naive to think SCEPP materials could be moved easily. The very association of the materials with southern California would make them suspect in northern California. He had talked with the chairman of SSC and found that Scott agreed that maybe SCEPP products were transferable in a purely technical sense, but they would not be in a political sense.

In FEMA eyes, BAES was the "son of SCEPP." But it was a very independent son, right from the beginning. Indeed, Eisner and Flores had discussions at the outset about relationships. They did not wish to compete, especially in terms of resources. They did disagree on the matter already noted--the issue of transferability--and also on the issue of a policy advisory board. Flores believed BAES should have one from the beginning. Eisner wanted to wait a bit. In one important area, they cooperated. This was in the "people transfer" of Paula Schulz. Her work with Los Angeles was winding down. She wanted to return to the Bay Area, where she had previously lived. Flores introduced Schulz to Eisner and facilitated the transfer. She immediately established herself as Eisner's talking partner and colleague. However, most of her time was spent on finishing work involving Los Angeles and what was called the large city prototype plan for earthquake preparedness. The latter project was based on Los Angeles, but was made as relevant as possible to other big cities.

Where Flores and Eisner also found themselves in full agreement was with respect to OES. They both saw OES as a problem. Eisner concurred that OES was fixated on response. Like Flores, he believed that there had to be a much broader planning process, one that thought about disasters over time, years before and years after the event.

However, whereas SCEPP was created deliberately outside the OES framework, BAES was created at a time when FEMA was pushing hard for a larger OES role. Since FEMA paid for BAES, it had leverage. An OES staff member was therefore placed on the BAES staff. The person originally slated was Jane Hindmarsh. However, Hindmarsh declined, due to her preference for staying in the Sacramento area. Instead, Larry Garrett came aboard. Eisner and Garrett did not have personalities that meshed. Also, Eisner felt he was supposed to be in charge, but Garrett made it clear to Eisner that he worked for OES, not Eisner. This led to strains and tensions.

There were also problems with the role on the study to be filled by someone from the State Geologist's Office. For various reasons, the first two individuals did not stay. The third person did, however. From Eisner's perspective, this individual was a good working partner.

While sometimes exasperated with his internal difficulties, Eisner worked to establish contacts with various regional and local officials. He sought to identify needs and previous efforts that had occurred, and critique them. The aim was to put together a work program with some three to five years of funding. Eisner made contact with city and county managers, elected officials, urban planners, and local emergency responders (fire, police, etc.). His major task, as he saw it, was to identify the key actors in the Bay Area Earthquake constituency. His associates from OES and the State Geologist's Office also performed their functions. Progress took place.

K. EARTHQUAKE PREDICTION REVISITED: THE SECOND ASILOMAR WORKSHOP

Under its one year extension from FEMA, SCEPP was to continue to emphasize prediction. That it did so was more the doing of SCEPP than of FEMA. The problem was that sometimes it seemed to SCEPP that only it wanted to think about prediction. It literally had to push prediction onto the agenda of many earthquake planners, emergency management officials, and even scientists.

Its basic strategy, aside from working with local planning partners, was to force thinking through policy-oriented workshops. The first workshop had been at Asilomar in 1981. This had been followed-up by SCEPP efforts to implement some of the recommendations growing out of the conference. Most of these efforts had borne little fruit. Hence, Andrews and SCEPP decided to remind various California parties it regarded as involved (whether they wished to be or not) in a potential earthquake prediction response activity of their need to plan ahead. The second Asilomar conference was to be held January 18-20, 1984.

In sending out invitations, Flores differentiated this workshop from that of 1981 in the following way. In 1981, he said, the emphasis was on "design" of an earthquake prediction, warning, and response system. In 1984, "the goal we have set for this workshop is the development of a course of action that can lead to the official establishment of an Earthquake Prediction Evaluation, Warning and Response System."⁹⁹

The specific objectives of this workshop were:

1. To clearly identify the required interaction among and between the scientific community, and the key federal, state, and local government agencies in responding to scientifically-based earthquake prediction.

2. To recommend the type and general content of agreements and procedures that need to be established to ensure that the required interaction among and between the scientific community and federal, state, and local government agencies takes place in a logical and sequential order.
3. To clarify the legal ambiguities in State and Federal law regarding the issuance of and response to an earthquake prediction/warning and recommend appropriate changes to the law.
4. To assess the compatibility of the terms with SCEPP's prediction response guidelines. (If compatibility is sufficiently ensured, to recommend to the USGS and NEPEC that these terms be officially adopted in issuing a warning.)
5. To clearly identify the roles and responsibilities of the federal, state, and local governments in responding to a validated (by CEPEC/NEPEC) earthquake prediction.
6. To recommend to FEMA specific criteria for evaluating the circumstances when the provision of federal assistance would be essential.
7. To explore the utilization of damage forecast capability as an integral component of the warning system.
8. To identify the necessary administrative and legislative initiatives to establish the system.¹⁰⁰

The list of 65 participants included Congressman Brown, Los Angeles Councilman Bernson, scientists from USGS and California Division of Mines and Geology, and policymakers from FEMA, SSC, and OES. Counties, cities, and corporations in southern California were also represented. It was notable that certain individuals who were not present at the original workshop in 1981 did come in 1984. These included Mattingly, Morrison, and the head of OES.

The participants set up a plan of action. Each action recommended was assigned a priority of 'high,' 'medium,' or 'low,' given a time frame to report progress, and assigned to a specific lead agency. For example, a high priority was attached to the development of common criteria for making prediction decisions related to public

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Ibid.

policy. This was assigned to NEPEC and CEPEC. Another high priority was formal adoption of the Wallace/McNally/Davis terminology by NEPEC, CEPEC, USGS, CDMG, OES, FEMA, and others.

High priority was also assigned to legislative changes to assure immunity of public entities for actions taken in the event of a prediction. It was also recommended that a procedure be developed for rescinding (or extending) a prediction, depending on what occurs after the initial warning. In the area of prediction response, it was suggested that all government entities in seismically hazardous areas develop prediction response plans.

The inclusion of damage forecasting into a prediction system was recommended. It was felt that damage forecasting should be applied in a multi-governmental and multi-hazard context.

A special task group synthesized the material from other task groups at Asilomar and assigned priorities for follow-up actions. Members included the conference chairman, Evar Peterson of Westminster, Homer Givin, Jack Kearns (the assistant director of OES), Andrews, and Bernson, among others."¹⁰¹

Those agencies and other entities that were assigned tasks to implement various recommendations were asked to do further research and make comments as to feasibilities in proceeding. Meanwhile, the recommendations were to be reviewed by SCEPP's PAB and the SSC. The new chairman of SSC, Bolt, was particularly concerned that a serious review be given the recommendations.

Exactly what would come of Asilomar II remained to be seen.

There were some policy results in the fall. The SSC wrote a bill that the governor signed into law in September 1984 that had a number of provisions: (1) it authorized local governments to

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develop prediction response plans and execute them; (2) it set forth some conditions for declaring a state of emergency; (3) it expanded prediction to include volcanic as well as earthquake prediction; (4) it included immunities for scientists who would bring prediction to CEPEC first, rather than publicly; and (5) it provided specific authority for CEPEC to hold closed sessions while deliberating on earthquake prediction.

Certainly, on an individual level, many who participated thought well of the conference, such as Mattingly and Morrison of Los Angeles. SCEPP felt it important to keep the broader aspects of earthquake prediction policy on the agenda.

L. TRANSFER WITHIN THE SOUTHERN CALIFORNIA REGION

For three years SCEPP had been working, first internally, then in association with planning partners, to create innovative "tools" to help California get ready for the expected great earthquake. Hundreds of public and private parties had been involved. There had been extensive review of materials by "peers" of the planning partners, including public officials, working as individuals, from the next set of prospective partners. The last document coming out of the original partnerships--the large city preparedness plan based primarily on Los Angeles--was now essentially done. In many ways, this document was symbolic of larger trends in SCEPP. Prediction, the key at the outset of the project, was deliberately omitted, in part because it was regarded as a possible problem of the plan in transfer from Los Angeles to other cities where prediction was not likely. So a separable section would be written that could be added, as desirable, to the overall report. As part of this report, there was a user's guide, which Mattingly, in particular, found helpful. Indeed, the user's guide, and her participation in the peer review of the large city plan, had helped move her to a point where she was much more favorably disposed toward SCEPP. It had been a long road for SCEPP and Los Angeles from the tableau to the user's guide.

Now the time had come to transfer those materials (including planning processes) to the first set of users beyond the initial four. As noted, the decision had been made early to go to counties. The next decision had to be: How do you go? This entailed questions, again, of efficient use of limited resources. The choice was made to go with fairly inclusive conferences, in which SCEPP and previous planning partners would discuss what they had done with the prospective new partners. To help plan and run the conferences, SCEPP contracted with a consulting/public relations firm, Hannaford Company. This used to be known as Hannaford-Deever. Deever is the James Deever, who had become a White House aide to President Reagan.

It is thus a company quite steeped in political contacts. SCEPP very much wanted officials at the county political levels involved.

SCEPP wanted to continue dealing with top policy officials, as it had in San Bernardino. Emergency service personnel would not be high enough in government, or be able to take a large enough view. Also, SCEPP felt it had to get official sanction from the top. If top policy officials would push, emergency management officials would come aboard, sometimes sooner, as in San Bernardino, sometimes later, as in Los Angeles. To help get top level attention, SCEPP had the help of policy-level officials already associated with initial planning partners. Thus, Rigney, Peterson, and Burts paved the way in certain cases by placing calls to counterparts in a prospective partner.

In Orange County, topside interest was shown December 13, 1983, when the Orange County Board of Supervisors adopted a resolution expressing its commitment to preparedness planning. The resolution stated specifically that "the Orange County Board of Supervisors supports and endorses the county's efforts, as a co-sponsor with the Southern California Earthquake Preparedness Project, to plan a county-wide conference that will initiate a comprehensive earthquake preparedness plan." The key individual moving the resolution was Roger Stanton, supervisor from the Council's First District.

On March 15, 1984, the first of the transfer conferences was held, with SCEPP and Orange County as co-hosts. Four hundred people attended, including many high ranking officials from the public and private sectors. On April 4, SCEPP joined with the Emergency Preparedness Commission for the county and cities of Los Angeles in sponsoring its annual seminar. Again, attendance was significant--600. As in Orange County, SCEPP presented its materials and orientation to the potential users. Many of the leading participants at both conferences had been part of the peer review process for the materials coming out of the initial partners. (Morrison, as chairman of the Emergency Preparedness Commission, was in charge of the conference.) The same use of former peer reviewers would be

true at subsequent conferences to be held with Riverside and Ventura.¹⁰²

At the conferences, it was stressed that both an approach and specific products were being transferred. The approach entailed comprehensive planning and priority setting. It was noted that while this approach was geared to a great, potentially catastrophic earthquake, it would be applicable to other major hazards.

The core documents SCEPP presented at the conferences were Comprehensive Earthquake Preparedness Planning Guidelines--guidelines for counties, cities, and corporations. Each guideline consisted of a "User's Guide," "Planning Guidelines," and an "Annotated Bibliography" of other materials that SCEPP had produced that would assist in the planning process. Other planning tools, consisting of additional guidelines and reports, were also available for specific use.

A document, Guidelines for School Earthquake Safety Planning, was provided by SCEPP to school administrators, risk managers, and others who attended sessions on school safety planning. Participants in the county, city, and corporate planning sessions received guides for reducing the risks of nonstructural earthquake damage and other materials to assist in their planning process.

The planning guides not only included planning for a great earthquake. They also included policies and actions for consideration in responding to a scientifically-validated earthquake prediction. Although this technology was far from perfected, it was developing and the public and private sectors were advised to plan for the possibility of a prediction because of the social and economic implications.

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"Counties to Apply SCEPP Plan Guides," Update II, No. 4, p. 1.

The counties attending the conference became prime "repositories" of the original SCEPP-produced guidelines, reports and public information materials. They also received materials appropriate to their needs and interests.¹⁰³ All these reports and materials were conveyed in ways that eased understanding on the part of users. The public relations firm helped in their packaging. Indeed, SCEPP viewed these conferences as largely marketing devices. Not surprisingly, as SCEPP moved from developing to marketing, those individuals within SCEPP with marketing-type skills played more prominent roles. A leader in this regard was Jeff Sampson.

For planning and preparing for the conferences, SCEPP's basic philosophy was: "They must succeed." As a consequence, considerable resources in money and time were allocated to make certain they were successful. These first two sessions were key, for they would set the tone for future transfer activities. As it turned out, there was general consensus that these conferences were exceptionally well received. One of the SCEPP staff people remarked afterward: "We busted our butts, and it was worth it."

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Ibid., p. 2.

M. SCEPP LOOKS AHEAD

On February 6, Assemblyman Alatorre introduced his bill. It was cosponsored by state Senator William Campbell, who was chairman of the Joint Legislative Committee on Fire, Police, Emergency and Disaster Services. This bill (Assembly Bill No. 2662) would continue SCEPP for three years and earmark funding to the California Seismic Safety Commission to oversee the project for the first year of the extension. It would provide \$750,000 to SSC for the 1984-85 fiscal year on the assumption that an equal amount would be forthcoming from FEMA through OES. The appropriation was for "furthering comprehensive earthquake preparedness in southern and northern California." [This language showed that the mandate of SCEPP was thus extended from what it had been in the 1980 legislation, when the language cited prediction and southern California.]

Section 2 of the bill read: "It is the intent of the Legislature that the work of the Southern California Earthquake Preparedness Project be continued for a period of three years. . ." The funding was made contingent upon the receipt of federal matching funds by OES. The work was stated as being a "joint project" of SSC and OES, "according to arrangements reached through mutual agreement of the executive director of the Seismic Safety Commission and the director of the Office of Emergency Services."¹⁰⁴ [This, of course, was a 180 degree change from 1980.]

Accompanying the introduction of this bill were more intense discussions of SSC-OES arrangements. At the same time, to help pave the way to a new arrangement at the SCEPP level, an OES planner, Ken Klemm, was assigned to work with SCEPP during the spring of 1984. Active with OES for 10 years, Klemm's specific assignment was to use

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"Bill to Extend SCEPP," Update II, No. 4., p. 4. Assembly Bill, No. 2662, February 6, 1984, California Legislature 1983-84 Regular Session.

SCEPP's planning guidelines to develop earthquake training guides for local governments and corporations.

Meanwhile, SCEPP began devising plans as to what it would do with three additional years, presumably in greater cooperation with OES after July 1, 1984. It was obvious that SCEPP's work would become less developmental and more adapting of the existing tools and processes. For a wider range of users, SCEPP would be heavily into technical assistance. At the same time, the activity in northern California would probably grow beyond a study to a SCEPP-like project. Specific details for both projects were hammered out in the first six months of 1984, and submitted to FEMA for federal funding.

An issue that began getting attention at the PAB level was possible use of SCEPP funds to induce local governments to cooperate in particular partnership efforts. This issue had come up in the case of Los Angeles City, and city officials had indicated some funds might have helped them to allocate more personnel in an active way to SCEPP work. Within the SCEPP PAB, however, Westminster's Peterson "indicated his reluctance to entertain any notion that funding might be dissipated to jurisdictions and hoped this was not contemplated; that cities should handle earthquake planning without augmentation of their budgets. The funding would be better spent to hire additional 'top notch' staff, in Peterson's opinion, to assist local governments. Deborah Barmack agreed with Peterson in principle, indicating that San Bernardino County participated willingly to plan for earthquake response. It is in the implementation phase where funds may be needed for specific purposes.¹⁰⁵

After further discussion in succeeding weeks, the issue of demonstration money was settled affirmatively--there would be such monies, but the amounts would be small, and very selective.

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Minutes, SCEPP PAB, January 26, 1984, p. 7.

There were a number of problems that cropped up as the state bill went through the legislative process, and the FEMA procurement process evolved. One was the initial resistance by San Bernardino to a SCEPP project in which OES was lead agency. Personal assurances from Medigovich to Rigney that OES would not intervene in local government affairs were apparently insufficient. The Alatorre bill had to be amended to state that "All plans and programs shall be voluntary and shall not be imposed on or required of any local jurisdiction. . ." Another stemmed from San Bernardino's concern with an amendment defining "local jurisdiction" as including "council of governments." This amendment had been inserted at the insistence of SCAG, thereby making SCAG eligible to receive the demonstration money. When Andrews and legislative staff sought to placate San Bernardino by removing the offending phrase, SCAG objected to the proposed substitute, and actively worked against passage of the bill. With San Bernardino's reluctant agreement, the original amendment went back in again.

Rigney points out that San Bernardino's perception was somewhat different. The county and city understood that the SSC was legally limited to a role as an advisory staff agency and thus there could not be a threat of intervention. OES, in contrast, was strengthened both by its key personnel and by its link to the state governor. OES could intervene in local programs. In a bid to transfer SCEPP to OES, SCAG solicited San Bernardino's support while the county condoned SCAG's access to demonstrations. Its support fell short of endorsing legislation which made cities, counties, and councils of government hierarchically equivalent. Following past policy, San Bernardino stressed its conviction that councils of government are created by cities and counties, and are not to be equated with them.

There were other problems, including some relating to how the funding was appropriated. In the end, the decision was that instead of the state money going to SSC and federal money to OES, the money would come equally to both agencies from both funding sources. That is, SSC would get \$375,000 from the state and \$375,000 from FEMA, and the same would be true of OES. This meant, potentially, a

strong SSC role in SCEPP, and DES role in BAES. It also caused headaches with Washington-FEMA, which insisted literally up to the time the bill became law, that it would work through DES, and DES only. It gave in, ultimately, and with some bitterness that the state was dictating to the federal government. The state, of course, held its ground, lest the federal government dictate to it.

Among the arrangements that made passage possible was a MOU worked out between Andrews and Medigovich. The MOU was largely written by Andrews, and concurred-in by Medigovich. The major point of the MOU was to assure that SCEPP, under DES, would continue to have the degree of autonomy it had under SSC. This was assured by the continuation of the PAB. Medigovich generally went along with what Andrews proposed. Indeed, Andrews largely engineered the transition. Whatever he might have personally preferred, intrinsically, he worked diligently to transfer SCEPP, and to do so in a manner that made it likely both PAB members and SCEPP staff would continue.

On June 27, with legislative success virtually certain, the final PAB meeting under SSC auspices took place. Bolt, new chairman of SSC, was there to give what he called a "commencement address." SCEPP was commencing--moving from the protective cloak of the SSC to the "real world" of DES. He praised the work of Olson, Andrews, Flores, Givin, and others who had been associated with SCEPP. He gave out certificates to members of PAB. Andrews then spoke, reflecting on his own personal recollections of an earlier PAB meeting, in 1981 (after Ledbetter's termination), when it looked as though SCEPP might fail. Now it had succeeded, and he felt a note of sadness that the people with whom he had worked so closely were "graduating." He also gave out certificates of appreciation to members of the SCEPP staff.

Medigovich now spoke, and made it as clear as possible that he was going to do all in his power to carry on where SSC was leaving off. The PAB meeting was very upbeat and positive. Everyone knew that it was that kind of meeting only because so much effort had gone into working out the necessary understandings, formal and informal, ahead

of time. A federal FEMA official, Richard Krimm, was there to commemorate the occasion. A generalist administrator on the model of other recent FEMA officials concerned with earthquakes, he nevertheless was administrative heir to Chuck Thiel, the federal earthquake entrepreneur who was primarily responsible for conceiving the notion in 1980. Now, in June 1984, for a moment in time, the host of entities concerned with earthquake preparedness in California were together in their fellowship. They felt they were witnessing an important moment in the course of earthquake policy in the United States. The most ambitious and innovative intergovernmental earthquake preparedness project in history was moving from its initial phase to a new phase. There was satisfaction with past accomplishment and hope for the future. On July 6, 1984, the governor signed the bill that extended SCEPP and made it a part of OES.

N. CONCLUSIONS

Was SCEPP a success? If success is measured by lives saved when the great southern California earthquake comes, the jury is still out on SCEPP's success. If success is measured by what most people who count in SCEPP's environment think, then SCEPP is indeed a success. Measured in terms of the most basic criterion of all, organizational survival, SCEPP has succeeded. The legislature wants to keep SCEPP. The governor wants to keep SCEPP. Even the one-time SCEPP skeptic, DES, wants to keep SCEPP, under its own control. Success, it is said, has many parents; failure is an orphan. SCEPP has many who point now with pride to their contribution to its accomplishments. Without question, SCEPP is a political success. It has a constituency, mostly of proponents. As a bureaucracy, it has survived, gained support, and may grow.

But there are two qualifications that must be added. First, this is "success-so-far." SCEPP is still a temporary organization. It has but a three year new lease on life. Second, political success is not professional or technical success, necessarily. It is fundamental to this latter kind of achievement, in the sense that without survival, nothing else is possible. But it is not identical. There are organizations that survive and do little. There are others that achieve, and do not survive. There are still others that do much while they are young and struggling for recognition and little after they feel secure. Exactly what the future holds for SCEPP remains to be seen. To this point, it has survived and fulfilled a good number of its goals. It is a success-so-far.

To measure the success of SCEPP, as well as limits on that success, it is necessary to focus first on what it was hoped that SCEPP would do. Then, it is required that we look at what it has/has not accomplished--why and why not. Then, it is necessary to examine the process by which SCEPP did what it did. Finally, the next steps in the SCEPP process are addressed.

Goals

From 1980 to 1984, SCEPP's goals have been relatively clear. They evolved, primarily during the period from summer 1980 to early 1981. After that, there were still changes, but these were at the margin. These goals can be derived from federal and state laws and FEMA-California cooperative agreements. They were:

1. to prepare southern California to respond to a credible earthquake prediction;
2. to prepare southern California to respond to a catastrophic earthquake;
3. to transfer innovations developed by SCEPP to users--not only in the target area of southern California but also to other earthquake-prone regions;
4. to upgrade the state of the art and profession of emergency management where earthquakes in particular were concerned; and
5. to raise the policy priority of earthquake preparedness in California.

These goals evolved in 1980. Prediction response was the original goal and is emphasized in SCEPP's legislative mandates. At the time legislation was formulated, there was the belief that prediction technology was advancing rapidly and there would be a credible, scientific prediction in the not too distant future. Over time, these expectations diminished.

Preparedness for the catastrophic quake was added following Mount St. Helens and the subsequent FEMA/NSC report. If a great volcanic event was possible, then so also was a great earthquake. California was not prepared for such an event. Neither was the federal government. Certainly, local government and the private sector were not ready. SCEPP was intended to upgrade planning for this especially serious type of event. This goal is indicated in FEMA-California cooperative arrangements, as well as policy planning discussions over the summer, 1980, prior to SCEPP's creation.

The third goal was made clear in the emphasis in legislation and administrative documents on transfer. It was not enough for SCEPP to develop prototype plans for predictable and unpredictable earthquakes. It had to get them transferred to governmental and non-governmental users.

The fourth goal was implicit, but was obvious in the way SCEPP was planned, organized, and staffed. It was to breathe new life into the profession of emergency management--in particular to upgrade its state of the art and pre-event thinking where earthquakes were concerned. To achieve these four goals, required a means so overarching that it too could be called a goal in its own right, again one that was more understood than stated at the outset. This fifth goal was to raise the priority of earthquake planning to a high policy level. These, then, were the five goals of SCEPP, explicit and implicit.

The emphasis these goals received varied over time. Prediction, for example, was strongest before SCEPP was formed. Once in being, SCEPP became more oriented to the catastrophic event. Only late in the SCEPP process, after prototype plans were well underway or in being, could transfer be given a great deal of staff time. Issues of "state of the art" and "policy priority" were less specific, more ambiguous, but always there. The first three were the "official" goals; the last two were unofficial, but instrumental to success with the first three. How did SCEPP do in achieving these goals?

Outcomes

In the case of prediction response, for example, SCEPP held two workshops at Asilomar. These workshops produced reports. These reports entailed background papers that were "the latest word" in thinking about this very complicated subject. Both workshops came up with recommendations for policy actions. These recommendations included prediction/warning terminology and new mechanisms for establishing and smoothing the prediction response decision process. In addition, SCEPP sent a study team to Japan to study prediction/

preparedness in that country. Again, a report was prepared and recommendations for a broad range of changes made. Most of the recommendations from Asilomar and Japan required relatively large policy decisions. Many were quite fundamental, as in calling for a transition from "passive" approaches to prediction to a more "active" mode.

A few policy changes have come as a result of these recommendations. California passed legislation in September 1984 that provides for certain immunities to predictors, and in other ways facilitates prediction and response. However, many prediction policies require national policy changes, and SCEPP's influence in that regard is minimal. It can be said that SCEPP has better informed the policy process, in general, through its work on the intellectual frontier of prediction response. This is important in its own right. Also important is the process of getting diverse actors (local government officials, scientists, national officials, media, etc.) together to discuss common problems. The process of keeping an issue on the agenda is critical, even though no tangible policy product can be seen as a specific outcome.

At the same time, in working with local planning partnerships, SCEPP has influenced policy processes of specific users in such ways as to include prediction response elements. This is an achievement. That SCEPP did not or could not do all that Los Angeles might have liked (and perhaps expected) tempers achievement with reality. SCEPP was also not as successful with Security Pacific as it might have liked. These outcomes point up the limits of SCEPP's ability to achieve changes in prediction where its partners were concerned.

Most of SCEPP's product and process successes lay in preparedness planning for the next great California earthquake. SCEPP helped various planning partners to develop prototype plans for themselves. These plans varied, but they all added material that was new to the user. These plans were incorporated into the procedures of emergency operating organizations.

As with prediction, the actual plans or products for the catastrophic event may have been less significant than the processes of developing those plans that were involved. The nature of planning for a catastrophic earthquake was such as to raise policy level concerns for users. Involving policy people in earthquake planning was important and a SCEPP goal in and of itself.

Similarly, a catastrophic earthquake cut a large swath across the agencies of any city (or units of a private corporation). Thinking about the unthinkable 8.3 magnitude earthquake on the south-central San Andreas stimulated entities not previously involved in earthquake planning into action. Indeed, in Los Angeles and elsewhere, planning departments became involved in earthquake preparedness--a field dominated traditionally by response organizations. The SCEPP process appears to have influenced who is involved and how in earthquake matters. This has contributed to reorganization and upgrading of emergency services functions in some of the planning partners. Such second and third order consequences of the SCEPP endeavor can have long term significance.

SCEPP made its greatest difference in terms of its specific planning partners (i.e., target users). But these were only four entities. Transfer was a goal that reached beyond these first four. What occurred was that it took longer to develop the initial prototypes than was originally foreseen. Hence, SCEPP was not able to consider transfer in any serious way until late in the period studied in this report. It can be said, however, that in 1984 SCEPP began the process in southern California in a serious and energetic manner. Moreover, there is transfer taking place in northern California, through BAES.

The transfer process is thus under way and can be expected to continue, given SCEPP's "renewal" for another three years. The products are now there, and can be used to stimulate other users. No doubt, the new users will adapt them to suit local circumstance. They will have a "user's guide" (a product of the SCEPP process) to assist them in their own earthquake preparedness planning.

In terms of raising the state of the art of preparedness planning, SCEPP has clearly done so. The Japan report was a major contribution to awareness of a "model" national prediction/preparedness effort. Already mentioned have been the Asilomar earthquake prediction conferences. Through prediction in particular, SCEPP has forced local earthquake planners to give more attention to preparedness measures prior to the event. To the extent the emergency management field has been weighted toward the response side, SCEPP's emphasis on what needs to be done before an event represents a needed upgrading of the state of the art.

Under Ledbetter (tableau) and Flores (comprehensive planning) an attempt that links pre-event activity with post-event activity can be seen. The tableau was indeed an effort to upgrade the state of the art to integrate various aspects of the earthquake planning process. It did not work. Flores speaks openly now of comprehensive planning and, it can be seen that SCEPP sees a need to go beyond simply pre-event elements of preparedness. SCEPP's role in upgrading the state of the art appears to be evolving and broadening with time.

Perhaps the greatest contribution lies not with "what," but with "how." The SCEPP process has been, under Andrews and Flores, a "bottom up" process. SCEPP has sought "user-driven" planning and largely achieved this approach. To the extent emergency planning was perceived, by locals at least, as state-dominated top-down process, then SCEPP has made a process breakthrough.

Finally, as mentioned, SCEPP has succeeded in getting earthquake policy planning raised to a higher level of concern in local and private planning partners. Not just professional emergency managers, but elected officials and high-level public and private executives have been engaged in the SCEPP process. This is perhaps the most important accomplishment of all, for it made other goals obtainable.

SCEPP is therefore relatively successful in making progress on all five fronts. Achievement in one area has aided achievement in another. This is not to say it has revolutionized thinking about earthquake preparedness. Not all the products have been well received by users, particularly in Los Angeles. There is unevenness--some products are better, some are less helpful to users than others.

The bottom-up process yields its own problems. Because SCEPP went to a "user-driven" approach, it relinquished much of its control over what would be produced, and how quickly. It got a lengthy emergency services manual-like product out of San Bernardino, for example, and this then had to be adapted again for SCEPP purposes. The process had its inefficiencies. The SCEPP process also meant that "customized" user plans made thinking (much less action) concerning regional approaches more difficult. More will be said on this point later.

SCEPP's record is not perfect, but what record is? The fact is that SCEPP was a needed stimulus to the earthquake scene in southern California. Users who chose to work with SCEPP have products and processes that they would not have had, had there been no SCEPP. There are individuals and organizations at a high policy level thinking about earthquake preparedness (including prediction) who probably would not be as aware had there been no SCEPP. Even the remaining gaps (and they are significant) in the preparedness mosaic of southern California are better seen, and thus addressed, because SCEPP has helped identify them.

All in all, SCEPP has succeeded in making headway on the five goals stated. There is a long way to go and the process has been painfully slow. The momentum could peter out. But southern California's earthquake preparedness is better off in 1984 than it was in 1980. It is a tentative success--but it is still a success.

Why SCEPP Succeeded

Successes in government innovation are rare. Rarer still are those that entail intergovernmental, public-private interactions. How did SCEPP do what it did? The answers to this question have significance beyond southern California to other ventures in earthquake preparedness. They suggest lessons that may be transferable, not only from southern California to other regions, but also from the earthquake field to policy sectors similarly requiring cooperation among governments and sectors of society.

SCEPP was created as a federal-state policy extension--to be an implementer. What it was to implement was innovative and new to southern California. It had few resources. Its budget ran about \$2.5 million over the period covered in this report. In contrast, Japan has allocated more than \$2 billion over a five-year period to an area one-half the size of southern California. SCEPP had no carrots to dispense or regulatory sticks to wield. It had a limited lifetime. It was slow to acquire a staff and never had more than nine professionals, few with noteworthy experience in the disaster preparedness field. It had three directors in three years and faced an environment of constant turbulence. Users were wary and federal and state sponsors uncertain in their support. Twice, all the SCEPP staff received termination notices. SCEPP came close to falling apart as an organization at one point. Yet, this small band of energetic outsiders in the earthquake business made a mark in a four-year period. SCEPP continues to live and make waves in a high-risk political environment.

SCEPP was an earthquake entrepreneur. Why was it a successful one? For SCEPP to succeed it had to have the following characteristics: (1) able internal resources, (2) external resources and allies, and (3) minimal opposition. These features required (4) leadership capable of using and making the most of the first three requisites. All four factors had to be brought into play and be maintained. Since various aspects of SCEPP capacity took time to develop, much

less be used in tandem, SCEPP had problems as well as accomplishments, especially in its early stages.

Indeed, it was not until approximately one year after SCEPP was born that these critical ingredients to success were aligned sufficiently to have an organization that jelled. In many ways, the firing of Carl Ledbetter came because these conditions were not present, and the firing forced those concerned with SCEPP to create or permit those conditions to evolve, subsequently.

(1) Internal Staff Resources

SCEPP deliberately recruited intelligent generalists. Such individuals brought a high conceptual quality to SCEPP. Given SCEPP's mission to innovate in what was considered a field badly in need of new ideas, this was a desirable aspect of implementation. But generalists in this case were amateurs in dealing with state bureaucracy and the professional disaster community. Relations with the bureaucracy were bumpy. SSC might have done more to smooth the way with the state prior to the Ledbetter era. But it is also clear that the lack of skill of SCEPP in dealing with state bureaucrats also contributed to the rocky start.

Also, the lack of knowledge of disaster management hurt SCEPP staff in proving they had the necessary expertise to lead others. The mechanism invented to display SCEPP expertise, the tableau, had the opposite effect, placing SCEPP's expertise in question. It was not the knowledge embodied in the tableau that was off target; it was the way it was packaged and presented that made it appear complex. The initial SCEPP staff scored well on conceptual matters, but low on "marketing" in an environment new to earthquake preparedness. By the end of the Ledbetter era, the generalists were learning and the situation with the state bureaucracy was improving. The tableau was being adapted; and new people, such as Paul Flores, who had experience with local government and disaster planning, were coming aboard. But by this time, SCEPP had gained for itself an image badly in need of refurbishing.

The SCEPP staff, before and after the firing, worked extremely long hours--60-hour weeks were not uncommon. Morale was relatively high throughout, except for the period following the firing. There was conflict within the staff that became visible during the Ledbetter period. Afterward, staff conflict was either minimal or kept private. Part of the reason may have been the staff changes Andrews made. Andrews sought to build a team with high esprit.

Also important was the realization by those inside that they had to pull together. They had a lot to do, and a limited time in which to accomplish anything. It was in the interest of the staff that SCEPP appear united and of one purpose. Staff members labored vigorously against urgent deadlines to make success a reality. Over time, the staff grew in size and gained enough expertise and credibility with those users it needed to satisfy to be able to function. While there was some turnover, it was not disruptive. The SCEPP staff--with its native ability, hard work, and cooperative approach--was a significant factor in SCEPP's ultimate success. SCEPP became more sensitive and careful, especially at the human relations of user interaction, with time. By 1984, SCEPP was a smoothly functioning single purpose bureaucracy whose major problem for the future seemed to be how to avoid the danger of running down, having run so hard to date.

(2) External Resources and Allies

SCEPP had various potential allies from the beginning. It had FEMA, SSC, and PAB. It also had certain individuals in the user community who saw SCEPP as helpful to them in their own earthquake entrepreneurship. These were individuals such as Burts in Los Angeles, Rigney in San Bernardino, Himel and Jacob in Security Pacific, and Evar Peterson of Westminster.

Prior to the firing, the various elements of SCEPP's environment were not a particularly strong support system, however. SSC, which should have been close to SCEPP, was actually at odds with the

fledgling organization. Ultimately, the director of SSC fired the head of SCEPP. Afterward, SSC's director worked closely with the head of SCEPP. Finally, the SCEPP director became SSC head, with his former SCEPP lieutenant assuming SCEPP directorship. From a relationship of distance and distrust (Olson-Ledbetter), the SSC-SCEPP relation went to one that was very close--perhaps uncomfortably close from the perspective of Flores, who sometimes saw Andrews as running SCEPP from Sacramento.

The importance of SSC as an ally was underlined by the changes that took place with FEMA. FEMA Washington was closest to SCEPP in the days of Thiel. SCEPP was Thiel's creation, more so than it was SSC's. When Thiel left, personal support in FEMA gave way to bureaucratic support. FEMA-as-an-organization was an ally of SCEPP and continued to provide funds. But bureaucratic support was subject to change in FEMA's political environment. As FEMA's own priorities altered, FEMA Region IX became increasingly important for SCEPP in gaining resources from FEMA Washington. Given the rapid changes in Washington, the institutional memory supplied by Terry Meade, in the region, was critical. Meade understood the Thiel goals (which emphasized SCEPP as a federal project with national interests in transfer), but also was close enough to the California situation to understand (and empathize with) SCEPP's difficulties at the state and local level.

Inevitably, FEMA's perspective led to problems for SCEPP, which had to satisfy multiple interests, including its own. But when push came to shove, FEMA supplied resources. It needed SCEPP, as SCEPP needed FEMA funding--just in case the state grew stingy. The fact that SCEPP had two financial parents was often awkward. But SCEPP also could use support from one to gain support from the other. One of the key lessons from the SCEPP experience is that two institutional parents are better than one. Indeed, they are essential if a project is to be truly intergovernmental.

Another ally was PAB. PAB was established to provide regional and local input to SCEPP. Was it a policy board in the sense of SCEPP's

principal source of guidance? Or was it an advisory board to SSC? It was initially not clear, because SSC under Olson encouraged PAB to play a policy management rather than advisory role. If Ledbetter was distant from Olson, he was close to Givin, and viewed the latter, not the former, as his principal source of support. The problem was that PAB had only as much power as SSC wished it to have, in a legal sense. The Ledbetter firing proved this fact--but it also led, ironically, to the creation of a viable PAB role.

SSC knew that SCEPP could not succeed unless it had local support. PAB was a source of credibility to locals. Indeed, key users were represented on PAB, such as Los Angeles, San Bernardino, and Westminster. The individuals on PAB were high level points of access for SCEPP into local government. These points of access would be closed to SCEPP, if SCEPP were seen as simply a tool of the state and federal governments. SCEPP had to be an intergovernmental instrument also of the locals. PAB was to assure that that would be the case. Thus, PAB had a role, in part, to buffer SCEPP from SSC and FEMA. It did not serve as a buffer when Ledbetter was fired. But, in yielding on the Ledbetter matter, it asserted itself in the sense of "never again."

Informally and through subsequent written agreements, PAB's role as a policy board was actually enhanced subsequent to the firing. Legally, SSC remained "in charge." But, PAB was brought closer to SSC decision making (symbolically, Givin was made an ex officio member of SSC). Communication among SSC, FEMA, and PAB was never closer or more supportive of SCEPP than in the immediate wake of the firing. As those inside SCEPP knew they could not sustain another trauma, so also did SCEPP's sponsors realize this. They saw PAB as important to SCEPP's viability, credibility, and ability to do its work. As they allowed PAB to assert itself, subsequently they allowed it to become a more useful and powerful ally of SCEPP vis-a-vis them. Over time, PAB became a source of ideas and initiatives for SCEPP. There was continuity in terms of chairman and members. They developed an esprit de corps, and worked assiduously in various ways on SCEPP's behalf.

Finally, there were the allies among the users. Already mentioned have been those on PAB who were also of the users. It is noteworthy that these individuals were policy level within their respective user settings. Burts, for example, was on the mayor's senior staff. McElwain was a supervisor of San Bernardino. Peterson was mayor of Westminster. Such allies were essential, given the nature of SCEPP's role. SCEPP was after preparedness innovations of a major kind. Incremental innovation could be expected, along traditional lines, from the disaster bureaucracies of the users, or from OES. But most of this was response-oriented, not preparedness/prediction-oriented. To get more changes new to the system required leverage on traditional bureaucracies. Local policy makers were essential to achieving that goal. SCEPP knew it, so did SSC, and that is why PAB was treated after the firing as an equal in the intergovernmental relations surrounding SCEPP. There were mutual dependencies, and the firing--and very real possibility of SCEPP's demise--made all concerned face that fact.

(3) Minimal Opposition

SCEPP had no overt opponents, and this fact contributed to its success. It had so many difficulties with its "friends" (FEMA, SSC, PAB, local users) at one time or another that it probably could have been severely injured by strong opponents. The problem SCEPP had with users (such as Mattingly and Morrison) was that it had to win the respect of the "pros." They were not "against" SCEPP--but they were skeptical that it could do Los Angeles much good, and they bargained hard for local advantages in any partnership that eventuated.

The organization that might have had the most reason to oppose SCEPP was OES. As SCEPP began, OES was fearful of a rival. Prediction was acceptable--but not preparedness. This was OES's turf. It did not agree with critics who questioned OES's competence to do what SCEPP was doing. Olson recalls that he had hoped that OES would cooperate with SCEPP--literally be a part of the "partnership." He

saw OES as a user of SCEPP materials. Indeed, he assumed that SCEPP would eventually spin off from SSC to OES. OES would be a better user if it were a full participant in the SCEPP process. But this was not to be.

OES did not trust SSC--or its progeny. Nor did SSC particularly trust OES. OES was represented in the planning sessions. But OES largely took itself out of SCEPP affairs shortly after Ledbetter came aboard. Ledbetter or his successors did not bend over backwards to placate OES. OES went its way; SCEPP went another.

Not until FEMA forced OES back into the picture did OES assert itself. But by this time, SCEPP was a mature entity, with a record. In the early years, when SCEPP was most vulnerable, OES was not an active opponent. It was not an ally. It stood on the sidelines, hurt, frustrated, defensive. The hurt derived from being outside the wave of innovation epitomized by SCEPP. It was frustrated because it had few allies itself to force SCEPP under its wings. It was defensive because it was constantly--and often unfairly--accused of ineptitude. Governor Brown was uninterested in OES, and he was the only political personality who could have matched SSC's legislative stalwart, Senator Alquist. FEMA was wedded by Thiel to SSC and even after Thiel left only very gradually shifted to an OES allegiance.

So SCEPP had the good fortune of not having to fight the bureaucratic wars of turf. SCEPP was delighted, for it did not desire to deal with OES, except in a pro forma manner. It had enough problems overcoming the barriers posed by local users' skepticism. The barriers posed by a strong state bureaucracy with which it sensed no rapport might have proved SCEPP's undoing.

In the long run, given OES's established role as the principal emergency management agency in California, it might have been better had SCEPP and OES worked more closely together at the outset. In the short run, given the personalities involved, such interaction might have severely hurt SCEPP, and there might not have been a long run for SCEPP to enjoy. There is a limit to the complexity in

environment with which any organization can deal, particularly a young and unproven one. Had SCEPP faced bureaucratic warfare, it probably would have spent more time on that than designing and implementing a program. SCEPP was therefore extremely fortunate that it did not have active and powerful opposition. It is lucky it did not become a counter in bureaucratic jealousies involving SSC and OES. In seeking lessons for success-so-far, the absence of a strong opponent must be emphasized. SCEPP did invade OES's territory. Had OES been in a position to fight back, the SCEPP story could have been quite different.

(4) Leadership

The fourth ingredient contributing to SCEPP's success was leadership. What SCEPP especially needed was entrepreneurial leadership. This kind of leadership is a form of organizational leadership different from management of a traditional government agency. It is a form of leadership that establishes a new course for an organization. Innovation was why SCEPP was created, and SCEPP could not have fulfilled its goals to the degree it did had it not been blessed with entrepreneurial leadership when it needed that quality most.

What is entrepreneurial leadership? It is a subtle blend of the technical and political aspects of management. It requires matching need with innovative solution, and it entails being able to go beyond words to deed. The technical aspects lie in the matching and internal management. The political aspects lie in the intuitive sensing of what can be done, who can help, how far to go, when to pull back, when to push ahead, when to speak up, and when to keep quiet.

Entrepreneurial leaders are rare. Rarer still are situations permitting entrepreneurial leadership. There needs to be a mix of personality, organization, and environment at a propitious point in time. Given those conditions, it can come to the fore. Missing any one, it cannot flourish.

The firing of Carl Ledbetter created the brief window in time when SCEPP and those who counted most in its environment were ready for entrepreneurial leadership. SCEPP was sufficiently formed to be beyond the kind of personnel and budgetary start-up problems that bogged down Ledbetter; but not so formed in personnel or organizational style that it would be resistant to a leader seeking to assert his stamp. The great unknown was whether Andrews would have the personality to make the most of the opportunity that was presented at the critical juncture.

There was no way to predict Andrews was ready to be an entrepreneurial leader. But SCEPP was at a stage of organizational development that made it ripe for one. There was a crisis situation. There was a need by others for SCEPP to survive for their own various interests. Others were willing to have Andrews take charge and were willing to support him on the "right" course. It was up to Andrews to know what course would be acceptable.

It could not be that chosen by Ledbetter. Ledbetter worked hard to raise the public visibility of the earthquake threat. The way he did it contributed to his losing his job. Andrews chose a lower profile. He would work within the system, rather than appear to attack it head-on. The way he went about that helped SCEPP not only to survive, but also to take a step forward in improving the earthquake preparedness system of California.

Andrews made peace with Olson, and then made the most of the support he received from Thiel in Washington, Meade in Region IX, Burts in Los Angeles, Rigney in San Bernardino, and Givin on PAB. He drew on the professional advice of Flores, whom he wisely made number 2 man. He did this in the course of other staff changes, some of which had to be painful. He dropped the tableau, which had become an unhappy symbol of the past. He used what few resources he had to enlarge support, as in his choice of who would go on the Japan trip. He carried through with tangible and action-oriented efforts, of which the Asilomar prediction conference stands out as a major example.

This was followed by a plan of program action that all could understand, one that was accompanied by organizational arrangements showing where Sacramento and PAB stood in the governance of SCEPP.

To be sure, SCEPP was not a one man show. But credit should be given to Andrews for succeeding in the role that was open to be played in the period after the firing. This was a time to seize; the environment and other necessary conditions were ripe for entrepreneurial leadership. But an individual had to step forward, take the personal risks, and rise to the occasion. Andrews was there and met the test. Had he not, the SCEPP experiment probably would have terminated in 1981.

Flores inherited an ongoing, high-visibility operation from Andrews and improved upon it. His style of leadership was more professional/managerial, and this seemed to be what was needed at the time he took command. Andrews had steadied the ship and set the course. Flores had to steer it home, avoiding innumerable rocks along the way. Flores implemented and completed partnerships with a steady hand, while Andrews--enjoying the fruits of his entrepreneurial risk-taking--advanced to head SSC, and fight SCEPP's political battles with Washington and the state from his Sacramento base.

Thus, four factors came together to make it possible for SCEPP to have a successful record: (1) internal resources--an able, cohesive, and dedicated staff; (2) external allies with political and administrative clout used on SCEPP's behalf; (3) minimal effective opposition; and (4) the type of leadership necessary to make the most of the first three.

Next Steps

What next for SCEPP? In choosing certain tasks to emphasize, SCEPP necessarily gave less attention to others. SCEPP's success-so-far was with the four initial users, and it took a very long time to make headway with some of them. It could not do everything and certain parts of its work received less attention. There are three

areas that need to be mentioned as particularly relevant "gaps" to be filled.

The Region:

In emphasizing individual partners, SCEPP thought less about the region. The dilemma of the bottom-up approach SCEPP adopted is that it is slow and customized. A great earthquake, or the prediction of one, would have a regional effect. What Security Pacific did in response could not be divorced from what Los Angeles City did--or utilities did, or any of the score of governments and private organizations in the Los Angeles metropolitan area did. What must be kept in perspective is the enormity of the threat (precisely what Ledbetter emphasized). If individual organizations (with their own individual plans) go in their own individual directions, there will be chaos. Ledbetter's tableau, whatever its faults, had the advantage of the strategic approach. It would get all partners thinking in a common way, from the outset. The fact is that, in the U.S. intergovernmental system, strategic approaches look like "top-down" approaches and just do not work unless those affected are convinced they have no choice. If the earthquake were known to be occurring in 10 years, there might be enough of a sense of threat to get a regional planning effort mounted along with the purely local ones. Without that sense of threat, regional approaches will have difficulty taking hold, and efforts to achieve collective responses will be resisted.

SCEPP avoided the regional issue. The Ledbetter experience showed the limits on how fast, far, and hard it could push. Moreover, SCEPP was having enough trouble coping with Los Angeles City. But SCEPP knew, and knows the regional planning problem will not go away and it will have to chart new strategies to deal with it. There are regional organizations in the southern California area. Each carries its own historical legacies of problems. Choosing a regional partner, or going it alone, are two options SCEPP faces in the future. Filling the "regional gap" in southern California is a formidable task.

Earthquake Prediction:

Prediction was once the priority reason for existence of SCEPP. As scientists themselves backed away from prediction, SCEPP had difficulty promoting the need for prediction response planning. To its credit, SCEPP has helped to keep prediction on the policy agenda of southern California when most others would have let it drop. SCEPP must continue to do so and must get some of the institutional changes adopted that its Japan report and Asilomar Conferences have recommended. Through SSC, some needed prediction policies for California have recently been enacted. However, these represent only a beginning in fulfilling the policy agenda raised by SCEPP.

It would help if SCEPP could get the scientists aboard in some planning partner capacity. No one knows how to do that. There have been scientists on PAB. But these scientists have apparently had limited influence on prediction policy, much of which must be made in Washington. USGS and the state geologist would appear to share with SCEPP the most stakes in creating a rational prediction policy regime on an intergovernmental basis. The problem is who takes the lead in designing and advocating this particular intergovernmental science policy system. SCEPP is poorly situated to provide more than a modest input in this regard. Yet, prediction is so potentially important--and disruptive--that it must do more than simply hold conferences to "inform" the policy debate. It must help influence policy--or influence those who have better access to Washington, D.C., than it does. The "prediction policy gap" is thus another major matter that remains if southern California is to be better prepared.

Transfer:

Finally, there is the "transfer gap." FEMA has always emphasized transfer. Transfer was one of the initial goals of SCEPP. It was not enough, for FEMA, or for California either, for SCEPP to develop and apply on a limited trial basis new planning technologies to just

a few jurisdictions in one region. It saw SCEPP as a national project. Hence, it has urged transfer within California and from California to the midwest and east. There is a problem here that is profound. The matters discussed above involving regional approaches and prediction policy are largely in the realm of research and development. What is really needed are new ideas and approaches for what is really a very novel and different kind of problem.

Yet the pressures on SCEPP are likely that it be less an R&D organization and more a transfer or marketing entity. Transfer is needed. SCEPP has only begun the transfer process beyond the four partners via its conferences in Los Angeles and Orange Counties. It has products now. These can be sent to new users, and SCEPP can provide technical assistance, as needed. But perhaps the planning tools will have to be "re-invented" or adapted by various users. Does SCEPP get involved? To what extent? How? Does SCEPP worry only about southern California or does it send its products to the north and beyond California? Does SCEPP send "transfer agents" beyond southern California to provide technical and marketing assistance? Should there be more SCEPPs? BAES was created for northern California. Should there be SCEPP-like organizations everywhere there is an earthquake threat?

And what of the interactions between SCEPP and its new "home," OES? Will SCEPP change to suit OES, or will OES become more like SCEPP? The great advantage SCEPP had in the SSC setting was that both organizations had a single mission: earthquakes. OES has a multi-hazard mission and it can be expected that there will be pressures from OES on SCEPP to "diversify a bit" to help it with other disaster areas. FEMA, itself, might help create those pressures, via OES, given its own drive for integrated emergency management. The problem is that SCEPP's work in earthquakes is far from done. SCEPP, as we have emphasized, is a success--but only "so far." Should SCEPP's OES-related mission change, so also, should be resources made available to SCEPP. However, there is no guarantee SCEPP would be successful if it moved into areas local government wishes it not to move, under direction from OES or FEMA, such as

land use, construction standards, post disaster planning, etc. SCEPP must be careful of where and how it diversifies, lest it lose the trust of the local governments.

Finally, there is the question: Is SCEPP transferable? Certainly, products are transferable, although they may have to be adapted to local circumstance. Processes are transferable, in the sense of planning partnerships, the bottom-up approach, etc. But the four conditions that made SCEPP successful may not be. A strong staff, influential allies, little or no opposition, able leadership: these are all in short supply. Also, SCEPP had a certain "cultural" advantage no other area has. There is a scientific consensus that a catastrophic earthquake on the south-central San Andreas is inevitable. The NSC/FEMA report constitutes a de facto long-term public prediction: better than 50 percent probability of a great quake within 30 years. That prediction was issued in 1980. The clock is ticking.

This circumstance means that prediction/preparedness will continue to have growing priority in southern California. Policy officials will not be able to ignore a time bomb. There are already some politicians who are finding they can gain votes by becoming champions of earthquake preparedness.

This growing "earthquake culture" can be considered a fifth ingredient in explaining why SCEPP was a success. The other four might be reproducible elsewhere. But in southern California, for all the jokes about building on the fault line, there is an inexorable situation building up. The newspapers and media become attentive. Every time there is a slight shaking, or a more serious quake, as in Coalinga and Morgan Hill, there are stark reminders. All this creates a latent need on the part of policy makers to act, for they know that the great event could possibly come while they are in office. If it does, they will be held accountable, politically, and perhaps even legally.

The great earthquake, and earthquake prediction, are not at the level of policy priority to be found in Japan, to be sure. But in California and especially in southern California, there is policy making of a level fundamentally different from that found elsewhere in America. It may not be at a high enough level, given the threat, but it is getting higher. What that means is that SCEPP is both a beneficiary of, and contributor to, the earthquake culture of southern California. SCEPP was born because there was a recognized need. SCEPP's existence and accomplishments have raised the degree of policy awareness still further. This creates an ever greater sensitivity to the need to prepare. There is thus a growing earthquake constituency on which SCEPP is able to build. SCEPP was able to push preparedness because there were users who knew, in their heart of hearts, that they ought to be doing more. There was pull to match SCEPP's push. Where that latent earthquake culture constituency is not present, SCEPP-like organizations may be formed. But they will face added hurdles to being as successful as the original model.

Still, there is now a model for earthquake entrepreneurship in the United States. Those who would seek to follow the SCEPP example have an experience from which to draw in making their own decisions-- to imitate, adapt, or depart.

APPENDIX VII-A

LOS ANGELES

Awareness

Los Angeles was quite aware of its earthquake threat. In 1971, there was the 6.4 San Fernando earthquake that took 64 lives, and caused \$530 million in damage.¹ In the mid-1970s came the Palmdale bulge. This apparent geologic unlift of the earth, centered on Palmdale, appeared to pose a grave risk to southern California. At about the same time, James Whitcomb, a California Institute of Technology (CalTech) researcher, issued a "hypothesis test" (widely perceived as a prediction) of an earthquake in the Los Angeles metropolitan area. The Palmdale bulge receded and the Whitcomb prediction was rejected by scientific evaluators. Nevertheless, concern was stimulated, and this concern continued into the late 1970s.

Mayor Tom Bradley was especially worried about damage a great earthquake might cause his city. Los Angeles had a problem. It contained 8000 old buildings known to be highly vulnerable to shaking, as well as more modern (even high-rise) structures whose resilience was untested by a major quake. Bradley's administration, which came to power in 1973, spent years promoting the passage of an ordinance that would direct owners of substandard buildings to upgrade them. This passed in 1980. Los Angeles also strongly backed the enactment of the National Earthquake Hazards Reduction Act of 1977.

In 1977, Los Angeles itself sponsored a study of earthquake prediction response, publishing a report in 1978, entitled "The Consensus Report of the Task Force on Earthquake Prediction, City of Los Angeles." In short, Los Angeles was not only aware that it had a

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Valley Daily News. Van Nuys, California. "Quake Safety Action At Last." October 5, 1982.

threat, it was working on mitigating that threat. Under NEHRA, it expected federal funding to assist it in its earthquake preparedness effort and to follow-through, in practical ways, on the Consensus Report. Instead, funds went to a temporary federal-state project organization called Southern California Earthquake Preparedness Project (SCEPP).

Trigger

Given the background of Los Angeles activity and expectation, SCEPP's creation was greeted with, at best, ambivalence by Los Angeles. There was no unified Los Angeles position, but it is fair to say that SCEPP was a "slow trigger" in terms of stimulating Los Angeles. Part of that was owing to Los Angeles' disappointment that its leadership in the field was apparently unrecognized and unrewarded by federal officials. Part of this was due to SCEPP's own fumbling in the initial meeting with Los Angeles (in April 1981), as revealed in this study's SCEPP report. Because of the unique Los Angeles background, SCEPP needed to make an artful and "winning" approach. That did not happen. In view of the human dynamics involved, it is noteworthy that the political leadership of Los Angeles (i.e., mayor's office) decided that the city would participate in the SCEPP activity, and retained that commitment in spite of the less-than-ideal beginning. True skill was demonstrated by the mayor's office subsequently in playing a broker role between SCEPP and the city's bureaucracy. The basic users in Los Angeles, it was recognized, were the emergency management career officials, and they would have to be satisfied with the SCEPP arrangement.

Search/Planning

Thus, the search/planning process that commenced in the wake of the first SCEPP-Los Angeles meeting was as much an exercise in diplomacy as in planning. Neither SCEPP nor the Los Angeles administrative officials assumed an agreement was inevitable. The political structure kept its distance, but urged accommodation. The discussions involved genuine bargaining, for the city wanted as much as it could

get from the relationship, with as little cost to it, in terms of personnel time. On January 6, 1982, Shirley Mattingly (chief administrative analyst, City Administrative Office, Los Angeles) wrote Paul Flores (then deputy director of SCEPP) regarding what would be necessary to have an acceptable MOU between SCEPP and Los Angeles. Mattingly stated that any meaningful agreement between the project and the city had to be based on:

1. identification of specific goals, objectives, and outcomes/work products (benefits) to be achieved; and
2. identification of the city resources and work effort needed for the project, and the source of these funds.

She went on to say that "Our primary concern must be what can we really do to mitigate the loss of life and property when a major earthquake hits. . . . In the absence of a bonafide earthquake prediction capability, our current emphasis should be on mitigation of damage from an actual occurrence." She asked SCEPP to review what the city had done, what it most needed to do, and how it might afford what it needed to do, as in the communications area. "The project needs to identify and deal with realistic, potentially solvable problems. . . . Emphasis on prediction planning within the city organization, in the private sector, and in community groups does not appear realistic in terms of the 'state-of-the-art'." She also indicated that it would help if SCEPP would finance city staff for any assistance it might provide SCEPP.

On February 4, Ezunial Burts (executive assistant to the L.A. mayor), Richard Andrews (SCEPP's director), and Flores convened at SCEPP headquarters to discuss alternative arrangements that could serve as a basis for an MOU between SCEPP and the city. With information in hand, a draft of an MOU was sent from SCEPP to Burts. It involved options that stressed comprehensive earthquake preparedness planning (i.e., earthquake prediction response, earthquake disaster response, and long-term recovery) and small business earthquake preparedness and/or community based earthquake preparedness.

Subsequent to this meeting, there were further conversations between city staff and SCEPP. Various drafts of a SCEPP-Los Angeles MOU were prepared. In a March 23 letter to Burts and Commander George Morrison, Police Department, Mattingly expressed her view that there was progress taking place. However, she remained concerned that a great deal of city staff time would be involved and "we have not fully identified the city resources and work effort needed for the project and the source of these funds." She felt that a variety of city agencies would be involved such as the planning department on long-term reconstruction, and the small business assistance office as possibly working with SCEPP on small business earthquake preparedness development. In fact, she noted, virtually every city department could be involved in one way or the other. A great deal of coordination would be entailed. She thought it only fair "that SCEPP should fund a city position for this purpose."

There were further conversations and drafts. It was made clear that SCEPP had no money it could (or would) use to fund staff time. The city, which was having economic problems and actually reducing its staff at this time, would have to add SCEPP to its existing burdens. Burts still regarded this as worth the investment of time. Mattingly and Morrison were skeptical. They had both attended the April 1981 "introductory" meeting and been unimpressed. But, SCEPP was designing a memo more and more in terms that suited Los Angeles' interests, and was saying SCEPP would do almost all of the actual work involved. As draft memos went back and forth, Los Angeles officialdom had strong bargaining power. Both Andrews and Flores believed SCEPP needed Los Angeles more than Los Angeles needed SCEPP. Indeed, Los Angeles was specifically mentioned in the first FEMA-California cooperative agreement covering SCEPP, and given priority for prediction response planning. Los Angeles was the heart of southern California. It was at the top of the partnership priorities for SCEPP.

SCEPP was not a top priority for Los Angeles users at the administrative level. However, SCEPP did not go away, in spite of the delays, and the Los Angeles mayor's office continued to press for

agreement, albeit very softly. Ultimately, it was up to the administrative users and SCEPP to work out an agreement. What the mayor's office did was create an environment favorable to the reaching of agreement.

Adoption

Eventually, a draft memo was written that seemed satisfactory to the city. On April 28, Mattingly attended a PAB meeting and indicated that the city was ready to go along with the MOU that was currently on the Policy Advisory Board's (PAB) agenda for consideration. The PAB approved this memo in principle.

Mattingly authored a City Administrative Office (CAO) Report to the mayor recommending mayor and council approval of the partnership agreement (MOU). The mayor's office forwarded the report to the council, where the council president referred the matter to the Council's Government Operations Committee for review and recommendation to the full council. Flores and Andrews appeared before that committee, which concurred with the CAO recommendations and voted to recommend support of the MOU to the full council. On September 28, the council approved the agreement, and on September 29 the mayor signed it.

As stated in the MOU, the objective of the work-sharing agreement was to "jointly address priority issues related to the achievement of comprehensive earthquake preparedness in the city of Los Angeles." The partnership was designed to enhance the earthquake preparedness efforts already under way in Los Angeles. Its major components involved:

- (1) stipulations that the final prototype plans would be produced such that issues of common concern would be addressed including:
 - a. community/neighborhood preparedness
 - b. private sector planning

- c. coordination of ongoing research
 - d. coordination of SCEPP-L.A. planning efforts
- (2) clearly outlined phases of the planning process
- (3) the delimitation of SCEPP's responsibilities to Los Angeles in the planning process.²

Implementation Begins

Five areas were targeted in the MOU for attention in the subsequently developed (October 1982) work plan:

1. To complete the "draft" of the city's Earthquake Response Plan and adapt planning process actions identified within the plan to current prediction terminology (prediction lead times).
2. To coordinate research efforts, data collection, and plan development with the "Pre-Earthquake Planning for Post-Earthquake Recovery" (PEPPER) project funded under the National Science Foundation. This would provide the city with a policy framework for decision making during the post-earthquake recovery period.
3. To follow-up on the principal recommendations from the Consensus Report of the Task Force on Earthquake Prediction for the City of Los Angeles, SCEPP would research and propose action on the following items:

Availability of federal disaster assistance following a scientifically based prediction or occurrence of a catastrophic earthquake impacting the City of Los Angeles, to include federal financial assistance and logistical support through FEMA and the U.S. military.

Clarification of the legal authority and liability of the City of Los Angeles in its response, including evacuation, to an earthquake prediction.

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"Memorandum of Understanding Between the City of Los Angeles and the Southern California Earthquake Preparedness Project." September 29, 1982.

In its studies of federal assistance and legal authority and liability, emphasis will be placed by SCEPP on pre-earthquake preparation and mitigation measures specifically including evacuation.

Provision of adequate earthquake insurance coverage, including federal insurance.

Special efforts will also be made by SCEPP to coordinate initial research related to hazard reduction, general preparedness and post-earthquake recovery, and process findings for the city in order to update existing plans and programs.

4. To stimulate and coordinate private small business and industry planning for a predicted or unpredicted catastrophic earthquake, in conjunction with the city's Office of Small Business Assistance.
5. To develop prototype emergency preparedness and response information for the handicapped. SCEPP would coordinate with the Los Angeles City Fire Department and other appropriate agencies to design and develop information addressing the special needs of the physically impaired, to include evacuation, alternate power sources, and specific shelter needs.³

When the "City of Los Angeles Planning Partnership Work Plan" was completed, it did indeed reflect the guidelines imposed by the MOU. Yet, the four-phase plan (Pre-Planning Activities, Planning Strategy Design and Development, Prototype Plan Development, and Evaluation) focused on preparing a large city prototype earthquake preparedness document in contrast to the smaller product orientation of the MOU.

On May 4-5, 1982, Andrews attended an Earthquake Planning Conference for Business and Industry held at the Century Plaza Hotel in Los Angeles. This conference was organized by Tony Prud'homme, an executive with ARCO in charge of emergency planning. This was one of a number of ad hoc earthquake activities taking place in the Los Angeles area. There were other individuals interested in earthquakes, and a few were in a position to do something about their

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Work Plan. City of Los Angeles Planning Partnership.
October 1982.

interest. Whatever important ad hoc activity was taking place in the field, SCEPP felt it should join in, and use each opportunity for its own advantage.

It turned out that Commander Morrison and Andrews were both participants in this conference and had occasion to get together at a hospitality suite in the Century Plaza to discuss mutual interests (and differences). For the first time, Andrews felt that relations between Morrison and himself were warming. Morrison had been particularly turned off by the initial meeting with SCEPP. Since Andrews was there, he was linked with that first meeting and its negative impression. The atmosphere of the SCEPP-sponsored hospitality suite was one in which the two men could develop a better working relationship.

Other informal relations helped to improve the SCEPP-Los Angeles situation. Los Angeles City Councilman Hal Bernson was promoting an international conference on earthquake prediction at this time. This led to city staff-time being devoted to planning for such an event. SCEPP volunteered to help. It was the perception of SCEPP that such free assistance helped win support among staff in the city. At minimum, it helped city and SCEPP get to know one another better.

Yet it was not until October 29, 1982, that the partnership was formally kicked off with a SCEPP Coordinating Committee meeting. At that point, it was expected that there would be only eight months to complete the activities outlined in the MOU. This would see the partnership completed by June 30, 1983. This made the determination of functional committees an imperative. The Earthquake Prediction Response Planning Committee, as it came to be known, was comprised of representatives from the Los Angeles City Administrative Office (Mattingly), the mayor's office (Burts), SCEPP staff, and city staff from key operating departments. Burts chaired the committee. Joan Arias, Paul Flores, Paula Schultz, and Mark Zierten contributed SCEPP support. Schultz was the principal staff person in SCEPP dealing with Los Angeles. Her primary job with SCEPP was to

implement the partnership. The fact that SCEPP was assigning a particular person (one qualified in planning with local government through previous experience with a regional organization, Associated Governments of the Bay Area) was important to Los Angeles.

Schultz focused initially on the NSF-funded Pre-Earthquake Planning and Post-Earthquake Recovery Planning effort known as PEPPER, already under way. The purpose of PEPPER was "to provide the city with a policy framework for decision making during the post-earthquake recovery period," and the bulk of the work was targeted for a workshop slated for May 3, 1983. The approach was to run mini-workshops before that time and then report to a Coordinating Committee overseeing PEPPER in March for feedback on the progress made to date. The May workshop and, hence, the earlier mini-workshops concentrated on federal disaster assistance and earthquake insurance as they related to planning strategy. This element was crucial to the Los Angeles effort because of the emphasis Los Angeles was putting on the immediately practical aspects of the partnership.

The research programs specifically under SCEPP also contributed significantly to the efforts of PEPPER. Both efforts investigated Federal Disaster Assistance/Insurance, and Legal Liability. One of the side-benefits for SCEPP (and Los Angeles) was that PEPPER worked primarily with Los Angeles' planning department, not previously identified with emergency planning. SCEPP was thus able to work with the planners, a natural set of allies for Schultz and Flores (both planners). Ultimately, the city's planners were included on the Interagency Los Angeles Emergency Operations Committee, under whom SCEPP worked. SCEPP's emphasis was pre-event; PEPPER's was post-event. The Small Business Preparedness Committee and the Preparedness Information for the Disabled Committee both served to target the needs of smaller segments of the Los Angeles population.

By November 1982, a plan of attack had been developed. This had involved duties, subcommittees, and the coordinating committee. While the subcommittees met to develop individual work plans and

time schedules, the coordinating committee intervened with checks on the partnership's general directional guidelines and reviews at regular intervals. Yet, in spite of the designation of subcommittee chairpersons in November, and evidence of some progress, there were problems emerging.

Implementation Problems

SCEPP went about its business with a minimum of contact with Los Angeles officials. SCEPP regarded its role as that of a "gap-filler," pursuing answers to specific concerns laid out in the memo. This included answering questions of local government's liability in connection with a prediction or event itself. Another question concerned whether there would be federal assistance for disaster preparedness prior to the event but after prediction. SCEPP produced drafts and transmitted them to Los Angeles.

The Los Angeles administrative people generally went their way and SCEPP went theirs. Within the formal partnership, there was still a distance. Informal relations, in certain respects, were better. Thus, the International Earthquake Conference, noted as being planned earlier, took place on February 7-11, 1983. About 400 policymakers and administrators attended the Los Angeles conference. These came from 23 nations of Europe and the Pacific Basin. The conference concluded with a number of recommendations:

1. share the experience of earthquake effects and mitigation measures among major metropolitan governments;
2. create channels of communication and cooperation among policymakers of major metropolitan areas with earthquake hazards;
3. encourage a continuing exchange between responsible policymakers and the Earthquake Hazard Research Committee; and

4. encourage the participation of decision-makers in the formulation of research objectives and encourage research in the social, economic, and public administration aspects of earthquake mitigation.⁴

As noted, this had been generated by City Councilman Hal Bernson. Los Angeles administrators, professionals, and SCEPP were involved in work on the International Conference. This indirect contact continued to be important. Flores, like Andrews before him, found that he and Morrison could relate well in these informal circumstances.

Mid-March 1983 saw a flurry of activity. "Information Planning for Persons with Disabilities" was presented by the subcommittee to SCEPP. It was to serve as the basis for an informational brochure. On the 21st, the Coordinating Committee met to review progress to date.⁵ At the same time, SCEPP transferred a packet explaining what it was doing vis-a-vis the Los Angeles Partnership.

Apparently, some of what SCEPP was doing (or not doing) was presenting problems for Los Angeles. In April, Flores received a visit from Morrison, in which Flores was informed that the city was displeased with the lack of communication it was having from SCEPP. He indicated that the Emergency Operations Board--an interagency committee that was the highest ranking policy group in Los Angeles for the emergency activities field--was planning to consider whether or not to request the mayor to charge SCEPP with noncompliance on the MOU with the city.

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Memo to SCEPP Policy Advisory Board from Paul Flores. February 16, 1983.

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Memo to City of Los Angeles Planning Partnership Coordinating Committee from Jeff Sampson. March 18, 1983.

Forewarned, Flores was forearmed. He met with Burts and other key officials prior to the meeting. He proposed actions that would alleviate the perceived problem. The Los Angeles complaint was that there was inadequate interaction between the two partners and that some of the work coming out of SCEPP was not on target with city needs. In discussing the matter with SCEPP, Morrison was serving notice that changes were necessary in the dynamics of the relationship. In effect, more user input was required.

SCEPP chose not to raise counter complaints, and identify problems in communication it perceived with Los Angeles. Instead, it turned the situation into an opportunity. SCEPP came into the April 18 board meeting with a list of "corrective measures" it would take to improve communications. The board, which was headed by Gates with Morrison as the key staff person, liked what Flores had to say. Also, Burts was unable to come to the meeting, so Mattingly read a statement from him. The statement said that he had confidence SCEPP would meet its obligations by the June 30 deadline. Moreover, he felt this was not the time to interrupt the partnership and evaluate it. What this meant was that the mayor's office would not wish to receive a complaint about SCEPP noncompliance. The mayor's office, the administrative officials, and SCEPP had thus all made it clear where they stood. Out of a problem in implementation that had been festering came a "clearing of the air" and new commitment to work more closely to make the most of the partnership.

The Partnership Process Intensifies

An immediate result of the April meeting was that the coordinating committee and various subcommittees began meeting more regularly. Joint progress--in the minds of both SCEPP and the city--was now underway. With more communication came more substantive disagreement. For example, in prediction, SCEPP wanted a two-stage prediction process like that employed in the San Bernardino plan--long term and short term. The city wanted a more finely tuned approach. An intermediate phase, they argued, would enhance preparedness efforts through more clearly defining appropriate actions at each

stage. Los Angeles regarded long term as the present phase, and involved the sort of activity in which it was currently engaged with SCEPP.

An intermediate stage would mean an acceleration of this kind of activity, with a greater sense of urgency. Short term meant evacuation. This was the view that prevailed, primarily because Burts, chairman of the Prediction Subcommittee, sided with the Los Angeles camp. It should be emphasized that Los Angeles had already given a great deal of attention to the subject of prediction, and felt that this attention to intermediate prediction was realistic. SCEPP had sought to transfer the Japanese model (two-stage) in connection with its own prediction efforts in California. Ironically, at the time of writing (August 1984), it appears that Japan may be reconsidering and may be giving more attention to intermediate prediction due to the fact that a "clear" and "neat" two-stage process may not be the most likely course of events.

Another disagreement entailed the city's interest in a functional (department by department) approach and SCEPP's orientation toward an integrated and comprehensive (across the departments) approach. The former approach began with the agency, and the latter with the problem (e.g., prediction). In this case, the city went along with SCEPP.

And, so it went--with give and take on both sides. SCEPP had been persistent in its involvement with Los Angeles, and was winning the city's respect. Along the way, Morrison suffered a physical disorder and was incapacitated. However, his police department associate, George Knop, was already involved in the exercise, and was able to carry on for him. Eventually, Morrison returned.

On June 22, SCEPP presented draft products to the Los Angeles Coordinating Committee. By June 30, most of what was intended to be done under the MOU was done. The Emergency Management Committee was

not satisfied with SCEPP's work on all parts of the MOU. The Mayor's Office, however, felt SCEPP had done well enough, and that the time had come to complete the partnership.

Burts' comments of June 1983, presented to the SCEPP PAB, summarized the more positive of Los Angeles city perceptions:

We've received now a draft of the final reports and a presentation is being made today to the Coordinating Committee. It really has been a slightly different role for me working with the staff, not as a member of the Board, but as a partner and to view from the standpoint of a city receiving services and matching our staff work with SCEPP project staff. Debbie (Deborah Barmack, of San Bernardino), I know that you and Evar (Evar Peterson, Mayor of Westminster) had a similar experience, but for me personally, it was truly a rewarding experience to watch our people respond to the high level of professionalism and competency on the part of SCEPP staff. It gave me sort of a sense of pride, but I've been a participant here and, Mr. Chairman, I think I really would like it reflected in our minutes as an official compliment from the city of Los Angeles to the SCEPP staff for putting together this important document for the city and taking us through a very important process. We have talked about prediction in the city of Los Angeles several years ago, but have never really been serious about prediction response planning, and here was an opportunity not only to finalize a piece of work that had been started, but to bring our people together and point out for us some major gaps in our planning program, not just on prediction but on preparedness in general, and I think it has been really to, really the SCEPP staff that has been able to be patient with our city people and provide guidance to us that has really brought the city to a point where we will now be able to put in place what I believe to be a good prediction response program and, more importantly, a planning process for continuing our preparedness in the city. So, thanks and compliments to the SCEPP staff.

Later that week, the SCEPP PAB⁶ accepted the reports, adopted recommendations, and formally communicated these to Los Angeles.

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Ezunial Burts, at SCEPP Policy Advisory Board meeting on June 22, 1983.

The Products

As the MOU stipulated, products came from the SCEPP-Los Angeles Partnership that proved useful to one or both parties. The first of these was a Prediction Response Plan, mentioned above. The three-phase, functionally structured plan, outlined actions by each department. This approach integrated the effort with existing governmental structures. A preface presented critical explanations and definitions.

The coordination of research, data, and plan development with PEPPER focused on three main areas of common concern: (1) federal disaster assistance/insurance, (2) data base development, and (3) the process for post-earthquake recovery. The small workshops and the culminating larger one were highly successful. Information and experience were exchanged and an efficiently coordinated approach to further work was established. The final lessons of this SCEPP-Los Angeles-PEPPER effort were to be ultimately incorporated in a large city prototype plan.

Research on federal disaster assistance, earthquake insurance, and legal liability appeared in three separate documents. The bulk of this work was conducted by SCEPP staff. Specific questions were answered and recommendations were made. The results of this effort were expected to be used as informational reports by the city. They also formed part of more comprehensive work being undertaken by SCEPP.

Small Business Preparedness efforts were reported in a document called "Guidelines for Local Small Businesses in Meeting the Earthquake Threat," which proved to be more suitable for companies with 70-100 employees. The actions addressed focused on the 72 hours

after a major quake. An audio-visual module was used to present the data, and a brochure summarized the information.⁷

Earthquake Preparedness Information for Persons with Disabilities became available in brochure form during the summer of 1983. The self-help guidelines were directed primarily at people with mobility, hearing, or sight impairments.

What also emerged from the SCEPP-Los Angeles Partnership was a document entitled "Large city Comprehensive Earthquake Preparedness Planning Guidelines." It was mainly a detailed how-to-approach a comprehensive earthquake preparedness planning effort. This plan covered the initial planning process, plan development, and the ultimate plan implementation. The plan elements were: preparedness and mitigation, emergency response and recovery, and each was supported by a list of essential functions. The document serves as a practical guide for a large city in danger of earthquake devastation.⁸

Generally, the city was pleased with the products. Morrison felt that they were somewhat deficient, particularly in connection with prediction-based evacuation planning. Also, due mainly to failures on the Los Angeles side, the small business planning provision was unsatisfied. Overall, however, Morrison believed the partnership had served a useful purpose. Mattingly, who had initially worried about city staff spending unwarranted time on the SCEPP process, had, herself, eventually spent considerable time. She, too, believed the SCEPP process had eventuated in some useful products--especially the User's Guide.

7

"Guidelines for Local Small Businesses," in Meeting the Earthquake Threat, interim draft. September 1982.

8

"Large City Comprehensive Earthquake Preparedness Planning Guidelines," SCEPP. May 1984.

Lessons Learned

There were also some negative lessons to be learned. Principally, this was that the whole process took much longer to get under way than it should have, in retrospect.

SCEPP's failure to approach the Los Angeles partnership with circumspection led to an appearance of ineptness and condescension which prolonged the initial phase of the partnership. Los Angeles was very different from SCEPP's other planning partners. These differences would have become evident had SCEPP started not with the tableau but instead with a needs assessment. But SCEPP was in a hurry, and had reason to be in a hurry, given its sense of FEMA priorities (later changed), and the earthquake threat. Had it looked at its users more closely, SCEPP might have leaped more carefully into the Los Angeles thicket. The partnership process would have therefore gotten off to a smoother start and much time would have been saved. Unfortunately, there were too many masters for SCEPP and they were forced to look up to them rather than beyond to the users.

APPENDIX VII-B
SAN BERNARDINO

Awareness

San Bernardino County has always been situated on the San Andreas Fault. The threat of a major earthquake is no more or less real than it ever was. The two tectonic plates that form the San Andreas are moving past each other at an average rate of four centimeters a year. The crust of the earth's surface, however, is shifting at about one quarter that rate and creating a significant strain. Once the crust starts to break, a tremendous earthquake is inevitable. An earthquake exceeding a magnitude of 8 on the Richter scale is a strong likelihood. This future quake could be more than 1000 times more powerful than the 1971 earthquake that had a magnitude of 6.4 and killed 65 people. The odds of a catastrophic earthquake are now 2-5 percent a year and greater than 50 percent in the next 20- to 30-year period.

The south-central portion of the San Andreas--where San Bernardino is--is considered the most likely place for such a huge quake because geologists have found that this strip has experienced at least eight major earthquakes in the last 1200 years at intervals averaging 145 years, with the last tremblor occurring in 1857. It is predicted that this next great earthquake will cause the most severe devastation in the United States since the Civil War, up to 14,000 deaths, 55,000 casualties, and \$20-50 billion in property damage. Pockets of extreme devastation would be scattered throughout a five-county area, with much of this damage affecting the San Bernardino area.¹

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Lee Dye. Los Angeles Times. "Is California Prepared for Big Quake?" Sunday, June 27, 1982. p. 1.

Generally, structures on bedrock would be expected to fare better because they would be subjected to high frequency, low amplitude vibrations for short periods of time. This is contrasted to the situation of cities built on alluvial soil (that which is composed of sand and clay eroded and deposited by the wind and rains from the mountains). Alluvial soil has a relatively high chance of ground failure, especially in areas where there is a high water table. This is true because of the susceptibility of the soil to liquifaction of the complete failure or loss of strength of a saturated soil due to shaking. Much of San Bernardino is built of liquifaction prone soil.

There was awareness of this earthquake threat. San Bernardino, through some of its policy leaders, had played an important role in the state and federal policy world. Robert Rigney, a professional, generalist county administrator, had been active on the California Seismic Safety Commission (SSC) for some time. Cal McElwain, a member of the Board of Supervisors, had been interested in his county's becoming a main communications center for emergency management, given its range of hazard concerns. He wanted to convert an old airport into such a center. George Brown, a congressman representing San Bernardino, had been a key sponsor of the National Earthquake Hazards Reduction Act of 1977. So there was awareness and activity. However, there was an admitted lack of preparedness in San Bernardino for the great earthquake.

Trigger

There is a possibility San Bernardino would have moved ahead without SCEPP. However, San Bernardino's perspective, at least as seen by Rigney, Congressman Brown, and other senior officials, was broader than earthquakes. As they saw it, San Bernardino had many natural hazards to which it reacted individually as governments with one hazard in mind at a time. In addition, there were technological hazards that needed attention. They wanted to deal with hazards on an integrated basis and had sought national legislation that would

help them. The legislative process, however, produced SCEPP, and this entity channeled the county's goals along earthquake lines. This was not necessarily bad. A great earthquake program could be almost synonymous with integrated hazard management. Rigney was a participant in the summer planning effort. He and other San Bernardino policy makers saw SCEPP as a useful vehicle. McElwain became a member of PAB. Rigney, as noted, was a member of SSC.

San Bernardino had a problem with earthquakes and knew it. What's more, their constituents knew it. There was a good deal of writing in the local press. The San Bernardino Sun, in a February 14, 1981, article, stated that a "quake could wreak havoc in San Bernardino amounting to 14,000 deaths, four or five times that many injuries, and \$20-50 billion in damages. Moreover, the article contended that San Bernardino was not prepared.

Such articles as this were prompted, in part, by SCEPP's new director, Carl Ledbetter. Virtually from the time he came aboard in February 1981, he began concentrating talks on the earthquake threat in San Bernardino. In giving speeches, Ledbetter deliberately aroused his audience, indeed, frightening them. He also upstaged some of the local officials who appeared with him or were in the audience. This did not go well with them, but it probably did contribute further to their desire to show action toward a serious preparedness effort. Also, they wanted SCEPP to succeed, for it would help them realize their own goals related to earthquakes and integrated hazards management.

Search/Planning

There was little search/planning by SCEPP and San Bernardino prior to their promulgating a MOU. Conversations among San Bernardino policy makers and Ledbetter went reasonably well. The feeling was: Let's get going and work out the details as we proceed.

Adoption

By late March, SCEPP's initial planning partnership MOU was in being, with San Bernardino. This memo, while vague, was sufficient as a basis for getting started, in the view of those involved. The MOU was signed by McElwain and Rigney (from the county) and Homer Givin and Ledbetter (representing SCEPP).² It called upon SCEPP to provide certain services. These services would include:

1. Development of an earthquake prediction/warning system and policies.
2. Assessment of earthquake vulnerability arising from geological and seismic conditions, hazardous structures and lifelines.
3. Workshops and in-service training sessions for planning partners.
4. Educational and public information efforts to promote public understanding of the earthquake threat and the meaning of predictions.
5. Development of mitigation-preparedness plans for specific sites within the county.
6. Integration of preparedness plans into a county-wide plan.
7. Preparation of reports and plans necessary to the planning process.

For its part, the County of San Bernardino would provide:

in-kind services, including meeting space for task force sessions, representatives from relevant and appropriate agencies to serve as task force members, relevant data and information such as existing earthquake preparedness and disaster response plans, assessments of local building inventories and other information useful in developing earthquake

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"Memorandum of Understanding Between the City of San Bernardino and the Southern California Earthquake Preparedness Project," in Status Report, San Bernardino General Services Agency, February 1982.

hazards reduction planning, and such additional assistance as requested by the project director, the PAB, the County of San Bernardino Board of Supervisors or the Coordinating Task Force, consistent with available resources.

The County of San Bernardino agrees to work with SCEPP staff, private industry, cities within the county, school districts, volunteer organizations, and neighborhood groups in promoting earthquake hazard reduction and preparedness as important matters of public policy, and to encourage jurisdictions within the county to support Planning Partner efforts.

The San Bernardino project originally embodied three dynamic efforts: (1) seeking scientific techniques for earthquake prediction, (2) expanding public awareness and involvement, and (3) continually upgrading emergency preparedness plans. While the first was dropped early as being both uncertain and beyond the power of the two partners, the latter two remained central to the very existence of the partnership.

The MOU read that it was anticipated that comprehensive, integrated earthquake hazard reduction plans would be completed under this work-sharing agreement approximately 18-24 months following the inauguration of the planning partner effort. On March 25, the proposed MOU was approved by SCEPP's PAB. With Rigney and McElwain's strong endorsement, San Bernardino's Board of Supervisors gave its approval to the memorandum on April 6.

Most encouraging was the implication that San Bernardino's success could hold for SCEPP's broader mission. If the first partnership could be heralded as a success, and could create thorough--and at least partially transferable--earthquake preparedness plans, then, as PAB Chairman Givin asserted, other partnerships and agreements could be entered into optimistically.

Implementation

The SCEPP-San Bernardino Planning Partnership formally began April 21, 1981. The start-up was occasioned by the final approval of the MOU by all parties. In the early summer of 1981, Howard Littlefield was appointed to head San Bernardino's side of the partnership. Littlefield was director of the General Services Administration. A senior administrator, both in years and status, Littlefield had an established reputation for "getting the job done." Rigney was anxious that someone head the San Bernardino side who could make the various departments and agencies of the county work together, and who had long-standing personal contacts with many other organizations (public and private) in the county. Besides, the planning orientation was supposed to come from SCEPP. Hence, Rigney chose a seasoned manager.

Problems

Unfortunately, early meetings between SCEPP and Littlefield did not go well. One reason was the tableau, which SCEPP was then pushing as its principal tool for planning. It did not go over well for much the same reason it bothered Los Angeles--it seemed too complex and "academic." Another reason was that the San Bernardino administrative people and SCEPP staff persons assigned by Ledbetter seemed to lack the necessary personal rapport, generally.

As a result, not much was accomplished on the partnership in the early months following adoption of the memo. The SCEPP director, meanwhile, continued making the threat more and more visible in San Bernardino. He himself became an issue with some powerful San Bernardino officials. San Bernardino county leaders who felt they needed SCEPP for their purposes worried that the SCEPP director might so alienate county and local leaders as to destroy the viability of SCEPP. Word of unrest reached Sacramento and Bob Olson of SSC. Olson was also getting feedback he did not like from other sources on SCEPP. Eventually, on June 15, 1981, he fired the SCEPP director.

In the midst of the turmoil following the firing, a critical meeting of federal, state, and SCEPP people took place on June 23, at SCEPP's offices. Chuck Thiel (Washington FEMA), Terry Meade (FEMA Region IX), Homer Givin, Richard Andrews (Acting Director of SCEPP), and various SCEPP staff were there. They agreed to put their immediate differences aside in the face of the very real threat that SCEPP would fall apart unless they cooperated to make it work. At this meeting, it was agreed among the parties that:

The general goal of SCEPP is to change the preparedness and mitigation status of institutions in southern California by working with planning partners in a cooperative effort. This is a developmental undertaking in that the changes will be continuous and ongoing. The value of the project will be based on what it leaves for future use.³

A number of understandings were reached specifically with respect to San Bernardino, the one partnership that was under way. It was stated that "We hope to develop a county plan which would outline procedures for response to predictions, to an earthquake itself, and for recovery from an event." This plan would not alter regional boundaries, but would seek to formulate a consistent and complementary response plan within those that already exist. In addition, "a separate program component which is not necessarily tied to the county plan is a regional education program which would be concerned with the schools, with special focus on bilingual education. The third element is a planned improvement cycle, or incremental improveent plan which would establish mechanisms for refinement and improveent of the plan prepared."⁴

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Meeting with SCEPP, FEMA, and SSC representatives, June 23, 1981.

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Ibid., p. 8.

It went on to indicate the expectation that:

there will be wide county representation in planning groups. By this, we mean that all groups within the county and all political and economic forces will be represented and will participate in the planning process.⁵

For SCEPP's part, there was a need "to provide San Bernardino with one SCEPP staff director for the technical work of the project." It was stated that Paul Flores, a planner with local government experience, who had recently joined SCEPP, would fill that role.

It was agreed that "the project director is the political focal point of the project and will attempt to work with local political entities so that the partnership will be efficient and effective. Any policy or political questions should be directed to the SCEPP director. It was agreed that SCEPP would have "to issue a regular flow of products."

On June 24, the first meeting of the PAB took place since the firing. There was a regular meeting and a closed, executive meeting. The regular meeting focused on the present and future work of SCEPP. It featured a briefing by San Bernardino's Littlefield. Littlefield's briefing described the ongoing emergency planning in San Bernardino and the county's expectations as to what help SCEPP could provide. The briefing was a positive note.

It was up to SCEPP to show it was competent to work with San Bernardino. Doing so was now primarily up to Andrews and Flores. Andrews knew from talking with Rigney that leader's great dissatisfaction with SCEPP, thus far. However, he also knew that Rigney and Littlefield were ready to keep trying to make the partnership work.

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Ibid., p. 8.

Under Andrews and Flores, the tableau was put aside. In its place a more consensual process was instituted. SCEPP adopted a "helper" mode, and let the user take the lead in conversations as much as possible. Under the circumstances, SCEPP had little choice. San Bernardino had to work. The Los Angeles partnership was in even worse shape.

Recovery

By late July, SCEPP was investing a great deal of staff time in San Bernardino. Flores took the lead in reorienting the San Bernardino partnership. He and Rigney knew one another from a previous occasion when they had worked together on a Binational Symposium on Human Settlement Along the San Andreas Fault. This linkage helped in regaining the necessary rapport. SCEPP presented a new attitude. It was listening and acquiescing to what San Bernardino was thinking about earthquake preparedness. For example, San Bernardino thought SCEPP had too many time frames in its prediction framework. At one point, SCEPP had talked about 13. What San Bernardino wanted were a minimal number of time frames, and SCEPP now went along with this view. What made sense to the county was a longer term time frame, say 1-3 months, and a short-term time frame, 1-7 days. Policy planning could be geared to these.

At the same time, the county wanted help on immediate response--the first 72 hours, and the short-term recovery period--the first month after the event. SCEPP was very anxious to help, and Flores was making progress at the San Bernardino working level. Littlefield, meanwhile, put together a county task force for planning. He worked first to get the cooperation of the mayor of San Bernardino, which was forthcoming. The object was to make the task force one that represented interests of both the county and city.

Key county departmental representatives and other community leaders were brought aboard the task force. SCEPP was also represented. Littlefield was in charge. Its basic mission was to furnish a county-wide coordination plan and operational prototype plans for

each (public, quasi-public, and private) organization under the task force's purview. The chief difference between what this task force was doing and what other emergency planners had done was the emphasis on planning for prediction responses as well as events per se. The assumption of SCEPP and San Bernardino County and the task force which they created was that there would be a prediction as well as significant earthquake, and the ramifications of both would be significant.

The first meeting of the task force was held on September 11, 1981-- a full five months after the initiating MOU had been signed. It was intended that the partnership accomplish its purposes within the next 15 months, and that it end December 1982.

In the remaining months of 1981, SCEPP gathered momentum, implementing the various tasks called for in its work program and agreement with FEMA. While Flores took the lead, other SCEPP staff provided assistance as needed. Whatever had to be done on SCEPP's part was done.

Thirteen task force subcommittees had been formed to develop plans for their respective functional areas. These groups were small and were encouraged by Littlefield to meet regularly. Each subcommittee was chaired by a task force member to provide continuity of effort and information and to prevent redundancy. The subcommittee approach attempted to give a comprehensive overview of earthquake preparedness for all sectors of the county, including public, private, and business-commercial.

Various SCEPP staff worked with the functional committees San Bernardino had formed. This entailed developing plans for the various committees in four parts.

- 1) The first was response to a "long-term predicted earthquake," that is, one which was predicted to occur one to two years in the future. This would include long-term planning actions such as changing building codes, identifying hazardous facilities, developing response plans, and the like.

- 2) The second part was a response plan to a "short-term prediction" where the earthquake was predicted to occur in one to seven days. In this instance, plans would call for those kinds of actions which would disrupt the normal way of life in San Bernardino and could involve such things as closing facilities or businesses, regulating traffic, protecting critical utilities and facilities, and the like.
- 3) The third part was the "immediate response plan" of actions to be taken immediately following the disaster and through the first 72 hours, where individuals would be essentially on their own, helping each other.
- 4) The fourth part, "short-term recovery," was a continuation of the immediate response activities and would include restoring supply of food, water, shelter, communications, power and transportation, and similar actions to be taken during the first month after the disaster.⁶

By creating subcommittees, plans would be far more detailed; yet, manageable as individual units. SCEPP guidelines were distributed to the appointed subcommittee chairmen as a means to provide some measure of uniformity of approach, so that, in the end, there could be integration of the individual plans. Over the remaining months of the partnership, the subcommittee met, labored to produce, and eventually integrate their plans.

The Law Enforcement Subcommittee was one of the groups. It was chaired by Inspector Gene Majors of the Sheriff's Department and produced a prototype plan for the City Police Department.

Under the leadership of Don Banghart, San Bernardino County's Fire Warden, the Fire, Rescue, and Hazardous Materials Subcommittee prepared prototype plans for both the Fire Department and the Paramedic Organization.

6

"San Bernardino County Task Force on Earthquake Preparedness Mission and Subcommittee Instructions," February 3, 1982, p. 3.

The Cities Subcommittee was charged with the formulation of prototype plans for a medium sized city (50,000-100,000) and a small city (less than 50,000). Initially chaired by Wes McDaniel of the San Bernardino Association of Governments (SANBAG), Johnni Hansen (also of SANBAG) brought the subcommittee through to completion.

Prototype plans for both an Acute Care Hospital and an Extended Care Facility were conceived by the Medical Subcommittee under Dr. Louis Mahoney's direction. Mahoney was the director of San Bernardino's Public Health Department.

The County Department Subcommittee had the broad mandate of developing plans for all county departments. Bill Bethel, director of San Bernardino's Emergency Services Department, led the effort.

A vice-president of the Chicago Title Company, George Moreland, chaired the Local Business Subcommittee. A prototype plan for small businesses was drafted on schedule, although the work by this group did not actually begin until April 1982.

The Transportation Subcommittee met often in its formulation of prototype plans for the county's rail system, airport, road system, and omnitrans. These plans addressed both the County Transportation Department and CALTRANS. The group sought and was able to attain data from most county cities.

SCEPP's own Mark Zierten initially supervised the Utilities Subcommittee plans for county gas, electric, water and telephone companies. Bob Boies of General Telephone completed the chairman's role. This was one of a few committees that had some existing response procedures to which to refer. These included diesel back-up power for the telephones, flexible joint pipe in water mains, and gas valves which closed with abnormal drops of pressure.

Ken Topping, director of the San Bernardino Planning Department, worked as head of the Building Hazard Mitigation Subcommittee. A special county-wide coordination plan was established by this group

to list criteria to evaluate structures, propose revised building codes, propose zoning and land use study, and propose ways to physically upgrade unsafe structures. From the outset, the Building Hazard Mitigation Subcommittee was very much interested in formulating plans which could feasibly be implemented.

The Volunteer Organization Subcommittee, chaired by Mary Gronewald of the DPSS, worked to prepare prototype plans for selected volunteer organizations as individual units, and for the coordination of aggregate volunteer activity throughout the county. The main goal of the volunteer organization was to facilitate emergency operations, whatever these might be. Researching available resources, developing processes to harness these resources, and then altering whatever mechanisms needed to be altered: these were the group's focus. When their final work plan emerged, it contained four prototype plans tailored to different types of organizations and had the San Bernardino Red Cross in its role of Service Coordinator.

Under the supervision of Sergeant Paul Curry of the Sheriff's Department, the Neighborhood Watch Subcommittee achieved significant success. The Neighborhood Watch system in San Bernardino was noted as being a highly effective branch within the national structure. SCEPP's plan was to develop this network and to disseminate disaster preparedness information, as well as crime prevention information. Further, communities could be organized into neighborhood entities which would work together during disasters. One of the main mechanisms selected to accomplish this task was the development of a procedural planning guide or "work plan." This plan was published in March 1982 and showed the fruits of extensive background research, and an implementation focus. Workshops and training sessions had been designed to accompany the planning guide. Dissemination of literature and information was thus facilitated. When the formal subcommittee mandate had been completed, Cheryl Inafuko⁷ picked up the project and ran with it. Working with the Sheriff's Department, SCEPP was thus able to produce a comprehensive and easily transfer-

⁷ She later got married and changed her name to Cheryl Tateshei.

able "Neighborhood Self-Help Program Guide" in 1983. The guide detailed not only how a community program should be constituted, but information on how this program could be realized.

The School's Subcommittee experience was also regarded as a success. Bob Bulman, under the direction of Charles Terrell, County Superintendent of Schools, led an effort which culminated in a number of transferable education packages before the program was completed. Joan Arias played the lead role on behalf of SCEPP. The group was charged with preparing prototype plans for a School Earthquake Curriculum and for School Safety. In December 1981, the group was making arrangements to secure a committee of San Bernardino teachers to assist in the identification of materials appropriate to teach about earthquakes and earthquake preparedness in the schools. The Superintendent of Schools favored the plan and the committee was formed in February. Independent of this component of the group's activities, January 1982 brought the publication of "Earthquake Education Curriculum Development for San Bernardino County Schools." The publication outlined a comprehensive strategy which brought the reader background from committee formation to the adoption of a school earthquake program.

One of the factors which augmented the School Committee's effectiveness was the interest of outside organizations. For example, the Los Angeles Junior League asked to become involved and Environmental Volunteers, Inc., emerged with material and a curriculum which they had already prepared: H-E-L-P (Hands-On Earthquake Learning Package). The only drawback was the materials' \$10,000 production costs. As far as school safety went, detailed lists of precautions to be taken and supplies to be accumulated were disseminated.

The overwhelming support for the Schools effort indicated that a conscientious response to information could be expected in this area. As Deborah Barmack, McElwain's assistant and alternate on SCEPP's PAB, asserted, the School effort was very likely to remain intact beyond SCEPP. That it did. By March 1983, when other partnership efforts were over, the School's activity was continuing.

A curriculum package developed by Environmental Engineers, Inc., and SCEPP had been used in San Bernardino, Adelanto, and was slated for Chino and Fontana. In June 1983, the six-month pilot test of these materials had been completed, evaluated, and heralded a success. Transfer was being realized.

The final subcommittee, Information and Media, was chaired by Elaine Marable, the County Public Information Officer. Her group prepared prototype plans for the involvement of newspapers, television, and radio stations in the earthquake preparedness effort. The group got off to a slow start. Internally, it suffered from the limitations of schedule conflicts which precluded frequent meetings. Externally, it met opposition from stations not favoring a local Emergency Broadcasting System; the need for separate workshops for managers and reporters due to perceived animosity between the two groups; and the inherent fact that the media reacts to events and is not generally engaged in policy formulation or any other kind of planning. Nonetheless, the group was busy late in 1982 desperately trying to make up time. A number of conclusions were eventually reached. These included:

1. Specialized material must be formulated to target different population segments (e.g., non-English speaking and handicapped).
2. Quantified evidence shows that materials already in use have heightened public awareness levels.
3. Material disseminated to the public should integrate earthquake awareness and preparedness.
4. A centralized information referral system is essential to tie public needs with data sources.
5. While a long-range approach is called for, short-term campaigns are needed to sustain public awareness.

Each subcommittee pursued its specific tasks during the first half of 1982, but in the second half coordinating functions were emphasized.

The partnership moved to its completion in December 1982. Littlefield acknowledged that the San Bernardino partnership could not really end. "The complex long-term response plans will need much follow-up work by the county, as the intended actions involve long-term fiscal planning and legal review for potential changes in ordinances where necessary." Components of the program had their completion dates extended to April 1983.

The de jure close of the SCEPP-San Bernardino Partnership was symbolized by the submission of a task force report to the San Bernardino County Board of Supervisors on December 20, 1982. It included a set of all plans developed by the subcommittees, an evaluation of test procedures, countywide coordination mechanisms to link the relatively isolated plans, and implementation strategies.

San Bernardino thus completed its role as the first partner in the prototypical planning process for southern California. The Board of Supervisors formally accepted two thick volumes of plans for county response on December 20, both to an actual earthquake and to an earthquake prediction--in anticipation of the day that valid predictions could be made.

Conclusions

Essentially, San Bernardino used SCEPP to do what it wanted vis-a-vis earthquake preparedness. While SCEPP leaned initially toward a sophisticated presentation of options and influences (witness the tableau), the county wanted--and eventually produced--what looked like an emergency services manual. Unlike Ledbetter, Andrews was willing to accommodate the San Bernardino orientation. It fell to Flores to see to it that the 600-page report from San Bernardino was adapted to something transferable. Seven meetings, beginning in February 1983, in which local government "peers" of San Bernardino were involved, whittled down the report to 85 pages. In August, this final product was presented to the board, and upon approval went to the SSC for the final stamp.

SCEPP learned much from the San Bernardino Partnership beyond the written products. The organization learned to formulate an agenda, create working committees to carry out the agenda, organize information, work with a planning partner, and adapt "products" for transfer.

The exercise proved generally satisfactory for both partners. The strengths probably lay in the fact it took place at all. An earthquake contingency plan would now be integrated into the county overall emergency plan. Strengths lay in the education and Neighborhood Watch components. Weaknesses were in participation by utilities (and private sector, generally) and cities. The private sector was not brought in as well as was generally believed necessary. And the cities were less than active participants, owing mainly to the fact of traditional rivalries (i.e., the county was in charge).

From a SCEPP perspective, getting various bureaucratic elements of the county to cooperate was an achievement. One encouraging sign of the San Bernardino project's ongoing impact in southern California was the January 1983 decision of the San Bernardino City Council to accept a draft earthquake safety ordinance designed to facilitate the rehabilitation of older city buildings. Another outcome of the project was realized the following month in a training workshop held in San Bernardino to present materials produced by the Environmental Volunteers. This same material was used to provide the county with a prototype project. Perhaps of most significance was the February 23, San Bernardino County Board of Supervisors approval of basic work plans presented by project representatives. There appeared to be impetus for continuing action. The specific programs which had resulted in prototype plans included neighborhood self-help, public information, curriculum development, and school safety.

Although the formal agreement between SCEPP and San Bernardino had been officially terminated, both parties sought to continue a working relationship. The San Bernardino-SCEPP Status Report was released in February, as well as a Public Information Work Plan for

San Bernardino and an Education/Information Supplement. In this same month, a task force meeting was the occasion for the distribution of "briefing books." These books contained:

1. revised mission statements and subcommittee instructions
2. membership and distribution lists
3. revised master schedule
4. final earthquake plan format

The continued implementation of SCEPP programs by San Bernardino seemed likely in light of the momentum that carried over from the project period. This had been inspired, in large part, by the partnership work.

Despite the personal and fiscal constraints under which San Bernardino had to operate, hazard mitigation has continued to develop within the county. Armed with specific plans, semi-institutionalized programs, and education tools directly resulting from the SCEPP partnership, San Bernardino has been able to move towards its integrated hazards management program. A consultant on this effort is Robert Olson, who is now in the private sector. What began as an earthquake program has affected the broader spectrum of natural hazards and has led the county to consider these hazards in its land use programs.

Construction in San Bernardino neatly illustrates the two types of impacts that the SCEPP partnership has been responsible for. The site selection, building erection, and staff reorganization for the headquarters of the county's integrated hazards management program represents the institutionalization of earthquake preparedness in the local government. The construction of a multimillion-dollar law and justice center on a base isolation foundation is the first building of its kind in the United States. It serves as an engineering example for engineers from myriad nations. San Bernardino is an innovator in the field of earthquake preparedness.

"The work of SCEPP has gone far in its production of specified plans, programs and equipment and in education tools. In addition, with its help, San Bernardino County's integrated hazardous manage-

ment program is much further along. A site has been chosen for the headquarters, staff reorganized, buildings constructed, and plans are being made for a total program. One of the integrated hazard management consultants is Robert Olson, former director of CSSC and now a private consultant. The County has continued to include seismic hazard planning in its land use programs and is funding a geo-based data mapping program which shows environmental development constraints such as earthquake fault lines, soil problems, and other environmental constraints. While this could have started with fire hazard planning, flood planning management, or any other program, it was earthquakes that gave it its initial impetus. Many County department heads and staff members are involved or have been involved in the Governor's task force and other local committees related to earthquake and hazard mitigation efforts because of the visibility SCEPP has given these programs.

In the field of construction, the County has pioneered a multi-million-dollar law and justice center on a base isolation foundation never before used in the United States and certainly the largest such facility used in the world. It has become a mecca for engineers from all parts of the world and will probably be the center of conferences on these types of building techniques in the near future.

Therefore, with all the personality problems, the ever present financial problems and uncertain organizational problems involving the state, local and federal agencies, SCEPP has managed to make a significant mark on earthquake and therefore integrated hazardous management programs in the future."⁸

8

Robert B. Rigney, Letter to W. Henry Lambricht, October 10, 1984.

APPENDIX VII-C
SECURITY PACIFIC

Awareness

The planning partner arrangement between SCEPP and Security Pacific Bank (SPB) sprang out of strong interest on the part of SCEPP and a few key individuals in SPB. The process went more smoothly than the Los Angeles, Westminster, and even San Bernardino arrangements. Nevertheless, the Security Pacific development was not without hitches.

SCEPP was obligated under its FEMA agreement to work out a partnership arrangement with the private sector, as well as public sector jurisdictions. SCEPP was interested in sparking this private sector relationship within the financial arena, but was initially slow to get started on this front, owing to its other priorities and problems.

At the same time, within SPB, there was concern that its existing emergency preparedness efforts were not adequate for a major (8.3+ Richter) earthquake. SPB is the tenth largest bank in the United States and the largest financial institution in southern California. The corporate headquarters is located in a 50-story high-rise building in downtown Los Angeles. Proposed in the late 1960s, the building was constructed in accord with seismic standards. In fact, the company drew on CalTech consultation in its design. Standards in effect at that time were surpassed in the ensuing construction. The multimillion-dollar building was completed in 1974, and housed some 5000 people during business hours.

The bank's overall disaster preparedness policy--a set of corporate by-laws--was designed originally with nuclear disasters in mind. Since bank executives generally felt there was little that anyone could do in a nuclear disaster, existing "policy" was essentially seen as impractical. What was needed, in the view of those con-

cerned with the earthquake problem, was a new policy specifically targeted to earthquake hazards, but with general disaster applicability. Such a policy would legitimate a number of actions in preparedness not being taken. The feeling was that, unlike nuclear disaster, a practical earthquake preparedness program could be feasible.

Trigger

SPB had two people in middle management who were most aware of, and interested in, earthquake preparedness matters, and served as catalysts of the SPB-SCEPP cooperative arrangement throughout its duration. Barry Himel was Vice-President for Emergency Planning. His background was as an emergency planning coordinator and, after five years at SPB, he was striving to increase concern within SPB for emergency matters, generally. Debbie Jacob was a political scientist by training who was later employed as a police officer specializing in life safety. She served at SPB as Vice-President for Executive Protection.

In June 1981, Jacob attended a meeting of the California Banker's Association. There she heard Richard Andrews of SCEPP discuss the earthquake problem. Later, she came back to Los Angeles on an airplane with Andrews. This interaction proved to be the trigger for initiation of the Security Pacific Partnership. Jacob informed Himel of the SCEPP project. They agreed that SCEPP could help them to achieve change within their organization. SCEPP could help them to make the earthquake threat more credible to their superiors.

Search/Planning

Himel and Jacob invited Andrews to SPB for a luncheon meeting with them and Irv Margold, an executive vice-president. Margold's role as head of the Bank's Contingency Planning Committee rendered his support important. There was general agreement that a SCEPP-SPB partnership was mutually desirable. SCEPP could more easily develop prototype planning products with a specific organization than an

association (California Bankers Association) as originally contemplated. Also, SCEPP was obligated to have plans involving a high-rise building. SPB was to fulfill two needs for SCEPP: (1) the financial institution and (2) the high-rise building. It was a "natural" marriage of interest.

SPB awaited a proposal from Andrews to launch a planning partnership. From its perspective, it waited a very long time. Andrews, however, was new to the responsibilities of running SCEPP, and there were many, many competing pressures, pulling on him at this point (summer 1981, after the firing of Ledbetter). It was difficult for Andrews to give SPB the attention it wanted, in part, because he felt he had to focus on the immediate problem areas: San Bernardino and internal management. Himel and Jacob felt they (the users) were being neglected and an opportunity was languishing.

In October, a SCEPP team visited Japan's Tokai region as part of its effort to understand the most advanced earthquake preparedness system in the world. Japan was at the same time hosting SPB's international corporate meeting. Debbie Jacob was there. She and Andrews had dinner together, and she pressed Andrews to accelerate the process while SPB was receptive. Andrews, shortly thereafter, in Japan, met with a top SPB executive, who made it clear that SPB's interest in working with SCEPP stopped short of prediction.

This was a significant "glitch" for SCEPP, since prediction response planning was initially its reason for existence. It was to study an ongoing prediction-preparedness system that brought SCEPP to Japan. While SCEPP's mission had broadened, prediction remained a fundamental element of SCEPP's obligation to FEMA and SSC. From the financial institution's perspective, however, prediction was seen as more a problem than opportunity, at least at its current level of technical readiness. A prediction that was a false alarm could mean a devastating run on the Bank. Andrews got the message that SPB did not want to talk about prediction.

Back in California, Andrews, Himel, and Jacob decided to focus on points of agreement, not disagreement, and discussions commenced in earnest. There was general topside support for Jacob, Himel, and SCEPP to begin developing a planning partnership not explicitly involving prediction. Andrews assigned one of his newer staff members, Gilbert Najera, to the Security Pacific relationship. Najera had already been broadly assigned to "private sector affairs," and so this was a logical extension of his portfolio. Still trying to work around the issue of prediction, Najera began to hammer out arrangements for a formal partnership with SPB. Dialogue with a large private corporation was under way, and SCEPP was encouraged. The fact was that this organization--or at least some key individuals within the organization--genuinely seemed to want SCEPP's involvement.

From January on, efforts had concentrated on the development of a needs assessment to determine SPB's present level of emergency planning and preparedness. Of particular interest in the needs assessment were the non-structural components (i.e., the hardware within the building) of SPB headquarters. Various programs were reviewed which could investigate non-structural vulnerability and alternative risk reduction measures.

A major step was taken in Security Pacific on February 10, 1982. At a luncheon meeting involving Andrews, Himel, Jacob, and Margold, Andrews handed out a document briefly describing a planning strategy and asked that ideas be run through Najera. The director of SCEPP continued to be encouraged by SPB's eagerness to begin a partnership, and assured the SCEPP PAB that a series of meetings would be arranged to finalize an agreement.

Adoption

By March, a work plan was developed and a MOU drafted. On the 18th of that month, John Harriman, Senior Vice-President, wrote to

Andrews confirming the Bank's willingness to work with SCEPP.¹ He referred to a "planning arrangement" instead of a "planning partnership" to avoid certain legal connotations of the latter within the financial community.

In the work plan, two areas were given emphasis:

1. development of plans and strategies for preparing for a catastrophic earthquake, including mitigation and employee education programs, procedures and policies for responding to a short-term earthquake prediction and the occurrence of a catastrophic earthquake, and development of specific recovery strategies and guidelines.
2. model plans for minimizing structural and non-structural damage in Security Pacific's high-rise corporate headquarters and guidelines for employee safety in the aftermath of a damaging earthquake.²

Prediction was addressed in a SCEPP-initiated draft statement of the MOU: "The main impetus of this planning arrangement is to adequately prepare SPB to respond to a predicted or unpredicted catastrophic earthquake event." However, prediction remained a source of contention between SCEPP and the Bank. A MOU was formalized in late March and a detailed work plan affixed. Harriman and Himel signed on behalf of the Bank on March 25. On April 21, 1982, Andrews signed on behalf of SCEPP, and Homer Givin (Chairman of the PAB) secured PAB approval before adding his endorsement three days later. The memo included the two emphases already noted, but the prediction element was markedly absent.³

1

March 18, 1982. Personal correspondence between John Harriman and Richard Andrews.

2

"Workplan for Planning Partnership: Security Pacific National Bank," March 1982.

3

"Memorandum of Understanding Between Security Pacific Corporation and the Southern California Earthquake Preparedness Project," March 25, 1982.

Implementation

A Coordinating Committee made up of Bank personnel was appointed and met to discuss the timing and phasing of the tasks to be accomplished as identified in the Work Plan, accompanying the MOU. This committee was chaired by Irv Margold. Then representatives were drawn from each department. These included, of course, Himel and Jacob. With the approval of the new arrangement, Himel, Jacob, and Najera had begun to broaden the coalition of support within the corporation. Not to waste time, the Committee convened for the first time on April 28, one week after the MOU became official.

In the next few months, the needs assessment drew to completion, along with a review of the Bank's existing preparedness procedures. An Employee Education/Information Program was investigated. SCEPP and SPB explored the possibility of enlisting the help of a consulting firm to assess Security Pacific non-structural loss possibilities.

By summer 1982, Himel was working full-time on the SCEPP implementation, and Jacob was also continuing to be involved. As part of the assessment, SPB and SCEPP staff worked with Scientific Services, Inc., a San Francisco-based consulting firm. Under an NSF grant, Scientific Services, Inc., had completed a study entitled "Computer-Aided Earthquake Analysis for Business and Organizations." The resultant computer program, COUNTERQUAKE, estimated life safety, property loss, and interruption of function effects of an earthquake. Measures to avert or alleviate these effects were linked and recorded under the headings of structural, non-structural, and emergency planning. It was the second element in which SPB was most interested, although relatively little use was made of the innovation.

On July 8, SCEPP met with SPB's representatives from the departments of personnel, public relations, and real estate. Timing and format for the Bank's training and education programs were the main items

on the agenda. As a result of the ideas exchanged and considered, five specific areas of emphasis were recommended as fundamental to Security Pacific's Employee Earthquake Education/Information Program:

1. The Earthquake Threat - Planning Motivation
A slide module to introduce the audience to earthquakes and the local earthquake threat. It was designed to stimulate a group to find out about preparedness and to begin planning for preparedness.
2. Mitigation Procedures in the Work Site
As the corporation follows the advice of an evaluator of non-structural hazards, documentation of the mitigation measures would provide a photographic record to be used in maintaining mitigation measures and in introducing them to branch offices. It would also serve other building tenants.
3. Employee Preparedness - Response Procedures at Work Sites
When the corporation had developed appropriate response procedures, a drill/exercise would be held. The documentation of that exercise could serve as a training tool for new employees and a yearly update of procedures for continuing staff.
4. Employee Preparedness - Home Preparedness
To encourage employees to carry out preparedness measures in the home so they would be able to function at the work site at the time of an emergency, knowing that their families had plans and had prepared themselves. There were many home-preparedness packages which were available and which could be purchased and adapted or distributed for family preparedness.
5. Public Preparedness - What Security Pacific Bank Would Provide in the Aftermath of an Earthquake
As the corporation develops its plans, the public can be informed through brochures to all clients/customers and an advertising campaign. Clients should be prepared for the interruption of services and for any special procedures the Bank would carry out following an earthquake.

These would continue to be detailed and refined throughout the duration of the partnership. All of the training would be carried out through SPB's in-house training center. By October, the needs assessment was in its final stages, and the employee training program was being designed.

Achieving Policy Change Within SPB

Aside from the education program, the initial focus of the SPB entrepreneurs was gaining a stronger identity for the earthquake preparedness mission within the Bank. In order to implement a comprehensive program--which included communications, transportation, vital records preservation, equipment, and an alternative headquarters office--SPB needed to apply resources. At SPB, gaining an "organizational code" for an activity was a way of tapping resources. It was a way of saying this function was important enough so that time and purchases could be charged to it, rather than bootlegged from some other more established category of bank action. It was money--but, more importantly, it was legitimacy.

To achieve this kind of legitimacy and autonomy, there had to be a decision made at the top of SPB. The existing policy of the bank, as noted, reflected planning for nuclear disasters, and did not include a formal provision for earthquake preparedness.

In the fall of 1982, Himel and Jacob met with George Moody, the Corporate President, on the need for a commitment by himself and the Board of Directors to a change in policy, indicating earthquake preparedness was a priority. Moody had been appointed to the National Board of Directors of the Red Cross, so he was sensitive to some of the issues involved. On the other hand, SPB was first and foremost a business enterprise. Himel and Jacob--SPB's earthquake entrepreneurs--were fully aware that they were asking the Bank to legitimate a commitment of resources for an activity that would not generate income. Nonetheless, Moody was approving of the notion of going ahead with a greater preparedness effort, even though the cost could be "six figures." Moody made a strong presentation on the need to update SPB's preparedness policy to the board of directors. In so doing, he indirectly endorsed the implementation of the SCEPP partnership and establishment of an "organizational code." Various departments were subsequently called together and program plans and objectives were formulated. Further, Himel and Jacob were now better able to get others to work with them.

Himel and Jacob now had to tailor a detailed cost structure to a specific program. There was the existing Contingency Committee, but the motivation had to continue to come from Himel and Jacob for earthquake preparedness. They found SCEPP extremely helpful, particularly insofar as the need to fulfill a SCEPP planning partner role provided a deadline-forcing function to get on with planning. By summer, Scientific Services, Inc., had completed its work at SPB regarding non-structural hazards. Further, this organization had coordinated its work on University of Florida EVACUNET program, developed by Thomas Kisko under a National Bureau of Standards grant. Kisko assured the Bank that he would be making a users guide available to SPB through SCEPP, and SPB agreed to field test the evacuation program. Another positive step was SCEPP's publication of a report on "Reducing the Risks of Non-Structural Earthquake Damage: A Practical Guide" that was, in large part, a result of its work with SPB.

The SCEPP agreement with SPB had called for "guidelines"--a set of plans for action by a high-rise bank that could serve as a prototype for similar entities. In the process of doing the guidelines, Himel and Jacob learned a great deal themselves. They also decided not to go after a program and budget for the program all at once. They decided that it was preferable to tackle preparedness in stages, incrementally, and hope that "the big one" would not come while they were gradually moving ahead. Funds continued to be utilized from various non-earthquake accounts through the first half of 1983. They did not go after an "earthquake preparedness" code as such, even though there was apparently management willingness to let them do so. Apparently, they decided the situation was not quite ripe.

The May 2, 1983, Coalinga earthquake, which registered 7 on the Richter scale, served to spur preparedness activities in SPB, as well as in most other SCEPP planning partners. For SPB, it emphasized the need to think about contingency planning for the Bank as a

whole.⁴ That is, it was not enough to plan just for SPB headquarters. Planning had to involve the SPB "system," with its multiple branches. A branch bank in Coalinga had been demolished, causing no real problems for the Bank as a whole. A building 100 yards away existed and SPB was able to move its operations to that site, until the branch was rebuilt. But if SPB headquarters in downtown Los Angeles were incapacitated, the entire system could be in deep trouble.

In June 1983, a major decision was made by SPB. This was a reorganization that created a Corporate Security Department. Debbie Jacob became senior vice-president in charge, with Himel working within her department as vice-president for Plans, Policy, and Procedure. Along with this new department came a new budget code. It was a security-in-general code, and security included a great deal. It certainly included earthquakes, if Himel and Jacob were involved. Jacob reported directly to Chief Executive Officer Moody. For the first time, earthquake contingency planning had access to a budget of its own. The reorganization and the Bank's new fiscal year occurred at the same time. However, in terms of "big money" preparedness items, such as bolting down all desks and tables in the building, the decision was to go slowly. Himel and Jacob continued to favor a gradualist strategy, but now they had a far stronger organizational base from which to operate, as well as topside support.

Conclusion

As the official SCEPP-Security Pacific Partnership drew to a close, both parties were satisfied that the arrangement had been carried out as specified and with positive results. In February 1984, SPB completed its corporate guidelines under the SCEPP agreement.

4

Lorrie Lynch and Katherine Seligman. "Quake Ravaged Town Starts Over." USA Today. June 6, 1983.

Presentation of these was later made in the Orange and Los Angeles County areas. From SPB's perspective, SCEPP served as an ally and a catalyst while simultaneously providing technical assistance, and internal credibility for what Himel and Jacob wanted to do. With SCEPP's help, SPB had developed:

1. an employee training program
2. scenarios for earthquake related problems at computer installations
3. a high-rise evacuation plan

among other prototype programs. To date, the Bank has taken specific action on elements of the prototype plan:

1. employee education programs
2. measures to protect vital records
3. plans for coordination with government services following a quake
4. emergency intercom system incorporating taped messages based on SCEPP guidelines
5. Red Cross CPR classes for employees
6. preparation of articles for an in-house newsletter.

For its part, SCEPP has secured earthquake preparedness prototype plans for a private sector financial institution and another for a high-rise structure. Technology transfer has been part of the work with SPB from its inception, and, as such, the partnership led to the realization of a very important goal for SCEPP. In return, SCEPP has supported SPB's earthquake entrepreneurs--primarily Himel and Jacob--without becoming directly involved in the Bank's internal policymaking.

With respect to prediction, the two sides agreed to disagree. SPB never accepted prediction officially as part of its planning program. Yet SCEPP has used the SPB "prototype" unofficially as a basis for more generic prediction planning for a high-rise financial institution. Both parties have held to their original attitudes and understandings. They focused on points of agreement, using one another to respective advantage. The result was a relatively successful partnership from the standpoint of each party's interests.

The only negative was that it took a long time to get started, a fact reflecting SCEPP's own problems, rather than any difficulties relating to SPB reluctance. Indeed, SPB, at first, was the seeming pursuer, and SCEPP (whose role it was to seek partners) the pursued.

APPENDIX VII-D
WESTMINSTER

Awareness

The entire SCEPP-Westminster Planning Partnership was implemented between September 1982 and June 1983. Under SCEPP's agreement with FEMA, SCEPP was to work out a prototype plan with a small city. SCEPP had begun conversations with Ventura County in spring 1982, but the process was slow to get off the ground. A meeting was scheduled between Andrews and city representatives from Oxnard, Ventura, Simi, and Thousand Oaks. The idea here was to stimulate earthquake prediction awareness where little existed. Although it was evident to SCEPP that the seismic threat in Ventura was significant, local elected officials appeared indifferent. The discussions failed to produce any concrete arrangements, so Andrews and Flores sought other potential prototype cities to consider.

Trigger

At the July 28, 1982, PAB meeting, Andrews obtained approval to pursue cities in Orange County interested in forming a planning partnership with SCEPP. Over the next few weeks, Andrews and Flores met with PAB members and Westminster mayor Evar Peterson (a PAB member himself) and his staff on a number of occasions. It was determined that although Westminster was not highly vulnerable to a great earthquake, the city could serve as a prototype planning partner. Peterson was eager to develop such a relationship.

Search/Planning

By the end of August, SCEPP staff was reviewing Westminster's recently prepared emergency plan. It was also holding general discussions with Westminster administrative officials. They had been instructed by Peterson that this was something the city would do.

Adoption

A MOU for PAB approval was prepared for discussion at the September 1982 meeting. On Givin's recommendation that the course of action be continued, general approval was granted. Thus, on August 25, the Westminster Partnership formally began.

The MOU was signed on September 21 by Givin and Andrews for SCEPP, with Peterson and the city attorney for Westminster having signed one week earlier. The MOU was a work-sharing agreement that specified the means by which the city could achieve comprehensive earthquake preparedness. As outlined in the MOU, the scope of work between SCEPP and Westminster included the following five areas:

1. Assess the threat to the city from an 8.3 magnitude earthquake on the San Andreas Fault and other potentially damaging earthquakes.
2. Assist city staff in preparing a draft, four-phase earthquake and earthquake prediction response plan.
3. Assist city staff in reviewing and expanding upon those preparedness and mitigation programs showing the greatest promise in meeting the city's needs.
4. Explore the various earthquake preparedness approaches available to the city in plan maintenance, program follow-up, and involvement of citizens and neighboring jurisdictions. This would include involvement of the County of Orange, Orange County Transit District, and other special districts not under city jurisdiction.
5. Make available to the city all information from parallel research done by SCEPP for other planning partners for inclusion in the city's efforts.

The MOU went on to delimit the rights and responsibilities of both SCEPP and Westminster with implementation being a future phase. It was general in nature and a work plan was completed as a supplement late in October.¹

Implementation

In September, Mark Zierden assumed his responsibilities as SCEPP's key project staff person in the Westminster Partnership. But it was not until November 18, 1982, that the project was formally "kicked-off."² The Westminster Project was a modified version of what had been adopted in San Bernardino. It drew heavily on the prototype plans and experiences of the county arrangement. In particular, the planning tools and public information results appeared to be readily transferable.

Six functional subcommittees were appointed at the beginning of December and subsequently met monthly. Each of their chairmen served on a coordinating committee, directing the broader planning effort. The subcommittees handled hazard mitigation, public information, disaster management, business preparedness, school safety, and volunteer assistance. A total of 28 people from Westminster were involved in this subcommittee work. At the end of the planning period, it was the city's goal to have significantly expanded the existing mitigation and preparedness programs through a comprehensive planning effort. This was to be achieved by each subcommittee's use of a "work sheet" where proposed actions for various functions were noted and then checked for compatibility with other elements of the program. This particular approach was designed in acknowledgement of the

1

"Memorandum of Understanding Between the City of Westminster, California, and the Southern California Earthquake Preparedness Project," September 21, 1982.

2

Memo from Cheryl Inafuku (SCEPP) to files, December 3, 1982.

fact that resources were scarce and it was necessary to seek efficiencies. Specifically, the functional plan that emerged included the following subcommittee tasks:

Hazard Mitigation Subcommittee: 1) Identify classes, numbers, and exposure level of the structural and non-structural hazards in the city; 2) identify alternative strategies for managing the threat and recommend long-term and short-term prediction response actions; and 3) provide assistance to other committees as conditions indicate.

Disaster Management Subcommittee: 1) Identify specific response actions appropriate to the city's emergency services organizations in responding to an earthquake prediction of an actual event; 2) identify areas of common interest in emergency response and develop coordination mechanisms for organizations' services, resources, and personnel; and 3) identify specific areas where additional support and planning is needed to augment the city's current disaster management capabilities (i.e., training programs, mutual aid agreements, volunteer/neighborhood self-help efforts).

Volunteer Organizations Subcommittee: 1) Develop coordination mechanisms for volunteer organizations and community networks; and 2) identify specific functions for volunteer organizations and community networks responding to an earthquake prediction or an actual event and determine (a) areas for possible coordination and (b) whether their organization/network has a primary or a supportive role in carrying out that function.

School Safety Subcommittee: 1) Identify the responses to earthquake predictions or events appropriate to schools and the roles and responsibilities of school officials in an earthquake prediction or event; 2) identify the information and training needs of the schools and related communities and ways to meet those needs; 3) outline the programs to be implemented in a comprehensive preparedness plan and the steps involved in implementation; and 4) establish a network to help the districts continue planning and implementing programs.

Public Information Subcommittee: 1) Identify existing city programs applicable to earthquake preparedness which will serve as a basis for continued planning and in order to avoid duplication of previous city efforts; 2) identify the earthquake information and training needs of departments and agencies of the city; 3) identify means of disseminating earthquake information to the public before and after an earthquake; 4) develop plans and guidelines for long- and short-term predictions, immediate emergency response, and

short-term recovery; and 5) identify preparedness tasks which city agencies can begin during or immediately following the planning effort.

Business Preparedness Subcommittee: An initial task of this subcommittee was to follow-up on the interest generated by Business and Industry Seminar held on February 9. Copies of SCEPP's Small Business Guidelines would be distributed along with a survey questionnaire to the 100 attendees representing various small businesses at the seminar. This survey would be used to test the effectiveness and application of the guidelines as well as identify the special needs and concerns of small businesses. A work plan depicting the specific objectives of this subcommittee was currently being discussed and would be made available shortly.³

The first Coordinating Committee meeting was held in October 1982. Cheryl Tateishi took over Mark Zierden's role as SCEPP's main liaison with the Westminster project at this time. Other SCEPP people were also involved since various SCEPP staff were assigned to the subcommittees as necessary.

One of the SCEPP-Westminster Partnership's most visible achievements was the earthquake response exercise coordinated by the city's Eddie Beals, held on April 8, 1983. Beals was Manager/Coordinator of the Emergency Services Division, City of Westminster, and was well qualified to do the work. SCEPP worked out a potential damage scenario and provided staff assistance for the event. The exercise proved to be especially helpful in locating problem areas and in responding to an actual emergency and alerting the city to its preparedness needs. For example, communication between emergency response groups proved to be inadequate and an area which would subsequently be addressed. "Quake and Rise," as the exercise was nick-named, boasted the participation of departmental representatives from each

3

"City of Westminster Planning Partnership - Work Plan." October 1982.

Westminster group, SCEPP staff, Orange County officials, the Red Cross, and local schools. As Beals later noted, the event successfully accomplished its goals.⁴

Although there were some delays, by late April, the project was 75 percent complete. Two phases of the planning partnership were finished and the short-term recovery phase was being addressed. June was a rush of activity. By July, Westminster was concluding its earthquake preparedness work with SCEPP. All six sub-committees completed their four-phase--long-term prediction, short-term prediction, response and recovery--earthquake preparedness plans and had submitted them to the Coordinating Committee for review. After careful review, the comments were generally positive. The Basic Plan Guide was seen as both complementary to existing city mechanisms and transferable to other jurisdictions. With some minor logistical elements of the plan clarified, it was approved at the August 24, 1983, SCEPP PAB meeting.⁵

Conclusions

A number of tangible products emerged from the SCEPP-Westminster work. A threat scenario for the city based on a quake along the southern San Andreas emerged as a base for specific plans. A "Special Report on School Safety" addressed the specific circumstances of four school districts and assessed the current level of planning.⁶ A reference of volunteer organizations and community groups which serve as potential disaster relief providers was compiled in a "City of Westminster Resource

4

Memo from Cheryl Inafuku to files. April 1983.

5

"Basic Plan Guide," SCEPP-Westminster, August 1983.

6

"Special Report on School Safety," SCEPP-Westminster, May 1983.

Directory." As an ongoing effort, Westminster Mayor Peterson expressed his interest in maintaining library service for the distribution of current and future SCEPP materials.

In October, Peterson's pleasure at the success of the Planning Partnership was evident from his comment that "Using earthquake preparedness as a vehicle, we have been able to adopt a broad disaster capability."⁷ For its part, SCEPP too had fulfilled its goals in initiating the Westminster Partnership. It had a small city prototype plan.

7

Evar Peterson, as quoted in SCEPP newsletter. "Quake Plans Completed." October 1983.

PART VIII
CONCLUSION

Three policy settings for earthquake preparedness have been discussed. They differ in terms of policy development. One is an advanced policy setting; a second, emergent; and a third is at an intermediate stage of evolution. Within each setting is a case of earthquake policymaking.

The advanced setting of Japan reveals a nation moving to establish what is, in effect, a national project for the application of earthquake prediction. Japan was engaged in research and development for many years and on a scale far larger than has been the case in the United States. It has also forwarded various mitigation and preparedness programs over the years. Now, it has linked prediction with preparedness in a way that is large in scale and the first of its kind in the world. It is a disaster prevention effort for the Tokai region, and a national demonstration of what can be done to minimize death and damage from a quake that is expected in the not too distant future.

The emergent settings of South Carolina and Nevada provide a very different picture of earthquake preparedness. First, prediction is not at issue at all. So little is known about seismic activity in these areas, that no one has raised, in any serious way, the matter of predicting a quake. In South Carolina and Nevada the problem is to get under way some modest effort in preparedness. The difference can be seen in terms of the maturity of policy. In an advanced setting, earthquakes have been high on the government agenda for years, and any number of national, state, and local policies have been enacted. The current prediction/preparedness program in Japan rests on a considerable base of policy and institutional development.

In an emergent setting, the problem is not to build on an existing base, but to establish that base in the first place. The struggle in South Carolina and Nevada is to make earthquakes a priority for policy, to get it on the agenda, and to keep it there. In the advanced system of Japan, the earthquake entrepreneurs are policy-makers--politicians and high-ranking bureaucrats. In an emergent system, they are largely outside the formal structures of government.

In South Carolina, the entrepreneurs are technical professionals, academics. They are working slowly and carefully in a conservative political system to educate the general public as to the threat. Their hope is that they can get change by changing public attitudes. Public pressure will, in turn, impact on state government, and state government will respond. It is a slow strategy and requires external support from Washington and like-minded professionals in other states. They do not have the overt reminders of the threat that can be found in advanced systems, or intermediate ones like California.

What can happen in an emergent policy setting, in the absence of public awareness and support, is seen in Nevada. Here, a policy process was set in motion from the top, via the governor. He had been triggered not by an earthquake but by a friend in California, who suggested a "performance gap" in his own behavior in this field. Nevada ought to be able to do more, he was admonished, and this governor agreed. He had a group of experts established to examine the problem and recommend solutions. This group came up with a number of recommendations, including a call for a body similar to the California Seismic Safety Commission. This would give the problem an institutional presence in Nevada, and the organization could become a bureaucratic entrepreneur promoting further earthquake preparedness changes.

It may have been a good idea, but its support proved quite temporary. An election occurred before the policy process concerning these changes could move very far. The new governor dropped

earthquake preparedness from the executive branch's agenda, and there was no champion strong enough in the legislature to carry the torch. If anything, there were negative feelings and indifference in the legislature. Belatedly, Nevada's earthquake entrepreneurs sought to bolster their position via a public campaign. But it was too little, too late. The earthquake issue slipped slowly and quietly to a lower and lower priority, and may in fact today not even be on the state policy agenda at all. In fact, the entrepreneurs have mostly moved on to other concerns. How vulnerable is earthquake policy as an issue in an emergent setting is pointed up by the Nevada case.

Somewhere between Japan and South Carolina/Nevada in policy development is California. The threat of an earthquake cannot be ignored in the Golden State. There are too many reminders, some quite destructive. However, what is different in the advanced and intermediate settings is the greater commitment and priority the issue has in the former. California may well be facing an earthquake as catastrophic as is the Tokai region of Japan. But California has not countered this discontinuous threat with a preparedness policy to match. There is progress, but it is incremental. The threat is perceived, but it is perceived as providing time for a more gradualist policy.

Unlike the emergent setting, there is state governmental decision. The issue is on the agenda, in a continuing way. There are governmental institutions and there are earthquake entrepreneurs in state government pushing from within as well as those externally pushing from outside. The dilemma is how fast and how hard to push, and in what way. SCEPP and the task force have provided impetus for the most recent increment in California preparedness policy. The sequence of increments goes back to the 1933 Field Act, and has continued into the 1970s. In the 1970s, the creation of the Seismic Safety Commission was the major organizational addition to California's earthquake policy superstructure. In the 1980s, it has been SCEPP and the task force.

The particular factors that led to the creation of these two entities and implementation of certain of their policies were many and diverse. What is clear is that one of the most important triggers was Mount St. Helens. This proved--in a way President Carter and Governor Brown could see--that a truly great natural disaster was possible in the United States. More than business as usual preparedness was needed--especially since the scientific community was now placing a great southern California earthquake within the realm of 50 percent probability within 30 years.

SCEPP, an intergovernmental project, and task force, a state project, were launched. Both were established as catalytic organizations, but SCEPP was more a traditional project organization, whereas task force was an assemblage of working committees. Both began with a strong sense of urgency and a sense that very large policy changes were necessary. Both, over time, became less ambitious (or more realistic) in their goals. In the case of SCEPP, the first director was fired for overstepping the informal boundaries limiting behavior of an entrepreneurial organization. He was coming across too strongly--not just seeking to change government, but to attack it. He wanted discontinuous changes quickly. His style was too direct and abrasive for the system to accommodate.

In the case of task force, a bill that would have augmented the resources of the task force and California government to fight the great earthquake was not passed. So California settled for something less than discontinuous change, but more than business-as-usual incremental change. There has been a significant move forward in preparedness. But not one adequate to meeting the challenge a great earthquake, or, as was initially hoped, prediction of one. What has been described and analyzed in this report is a more gradualist "success-so-far" in earthquake preparedness. The goals are still there; it is just that they are being met more slowly than those who take the threat of a catastrophic quake seriously might have hoped. There is no scientific certitude that the great earthquake is imminent. Consequently, the system is behaving as though there is time.

When all is said and done, it is the credibility of the threat that distinguishes the advanced, emergent, and intermediate systems. Japan, having experienced genuine catastrophic disasters of many kinds, knows that it must take a great earthquake seriously. It does so in policy-relevant ways. Its already substantial preparedness was accelerated further by a prediction deemed credible of a great Tokai quake in the not too distant future.

In South Carolina, which has not suffered a serious earthquake since the 19th century, and Nevada, where no one has died from an earthquake in historic times, there is a difficulty for the average person to give earthquake threat a high priority. California represents a situation that is in between. There is concern, enough concern to keep policy preparedness a constant on the California agenda. The issue is whether that concern is sufficient for the great earthquake that comes infrequently, but which is now coming due in terms of historic recurrence intervals.

In each system, there is policy movement, in line with the nature and capacities of various earthquake entrepreneurs. In the advanced system of Japan, entrepreneurship has been internalized within the bureaucracy and even among some elected officials. In the emergent system of South Carolina and Nevada, the earthquake entrepreneurs are outsiders, trying to get the insiders to pay attention. In California, there are temporary project organizations that have played the entrepreneurial role, seeking to instill a greater urgency for preparing for the "big one" and thus raising the level of preparedness significantly. Temporary project organizations can do only so much. Ad hoc, they can push only so hard. The question now is whether their sense of entrepreneurship and priority can be transferred to the regular governmental apparatus. There is also a question as to whether there is the time.

