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Report on
Workshop on "Preparing for and responding to a
damaging earthquake in the eastern United States".
16-18 September, 1981; Knoxville, Tennessee, U.S.A.

by
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A workshop on "Preparing for and responding to a damaging earthquake in the eastern United States" was cosponsored by the U.S. Geological Survey (USGS) and the Federal Emergency Management Agency (FEMA). The chairman of the Steering Committee was Dr. Walter W. Hayes of the USGS in Reston, Va. The workshop was held from 16-18 September, 1981 in Knoxville, Tennessee. The reason for the choice of the place was that a conference on "Earthquakes and Earthquake Engineering: The Eastern U.S." was held there immediately preceding the workshop.

In the words of the chairman of the Steering Committee, the workshop was intended to be different from the usual ones in that they wanted to share their concepts and objectives with the participants. They not only did that but kept the participants very hard at work. The objectives, according to the Steering Committee, were stated as follows.

- a - The objective of the workshop is to prepare three 5-year plans, one for the central United States, another for the southeastern United States (emphasizing South Carolina and perhaps Georgia), and the third for the northeastern United States (emphasizing New York and Massachusetts). The plans should cover preparedness and mitigation actions to be taken in each of these geographic areas. The plans will be published as recommendations of the workshop on or about February 10, 1982.
- b - We want to build on the freshness of the information, ideas and motivation generated by the immediately preceding conference in Knoxville on "Earthquakes and earthquake engineering in the eastern United States".
- c - The workshop will be attended by some 50-60 invited participants, selected for their preeminence in each specialized field of knowledge to be discussed and for their capability to set goals, identify problems, and reach solutions in earthquake preparedness and mitigation.

- d - The Steering Committee and workshop leaders will have to accomplish a great deal of work before the workshop starts so that: (1) the workshop sessions will be action oriented, rather than information exchange sessions and (2) actions will arise from the ideas and close interaction of experts having different disciplines and perspectives.
- e - Each of the three panels will have support personnel available to facilitate the production of written materials.

A copy of the final program is enclosed for more detail. During the plenary sessions invited speakers addressed six topics, based on experiences in other geographic areas, to serve as a basis for discussion of the problems in the eastern United States. Of these papers the one by Joanne Nigg, Arizona State University on the "Societal Response to Earthquake Threat in the Eastern United States: Issues, Problems and Suggestions" should be of particular interest to seismologists since we in general are removed from that field of study. At the workshop speakers were referred to as Stimulators.

Topic 1: Hazard awareness and public education.

Topic 2: Public sector participation.

Topic 3: Intergovernmental and organizational relations.

Stimulator: Richard Andrews; Southern California Earthquake Preparedness Project.

Topic 4: Local earthquake - resistant design.

Stimulator: Anshel Schiff, Purdue University.

Topic 5: Land use.

Stimulator: Don Nichols, USGS.

Topic 6: Response to a damaging earthquake.

Stimulator: Don Eddy, formerly Director of Region 8, FEMA/FDAA.

Participants of the workshop were divided into their respective panels to discuss the 6 topics and to determine action plans on the topic of the workshop. The details of instructions, from how to run a successful meeting to a review of seismicity of the eastern U.S., and suggestions were contained in an 80 page binder that was made available before the workshop, to each participant but I will not enclose it here.

Panel 1 - Central United States

Cochairpersons: Otto Nuttli; St. Louis University and
Joe Hayes: FEMA. The panel consisted of
about 28 persons.

Panel 2 - Southeastern United States

Cochairpersons: Gilbert Bollinger; Virginia Polytechnic
Institute and Jack Richardson; FEMA.
The panel consisted of about 20 persons.

Panel 3 - Northeastern United States

Cochairpersons: Paul Pomeroy; Rondout Associates Inc. and
Phil McIntyre; FEMA. The panel consisted
of about 12-15 people.

The disciplines of the panel members varied widely:

earth science, research
mitigation and response
engineering
insurance
business
political science
decision maker
social science
media
public policy
public information
hazard awareness, public information
land use planner
engineering design.

The panel members came from the private sector, federal, state and municipal governments, universities in the United States and two from the Canadian federal government. Not all disciplines were represented on all panels and their definition is that of the Steering Committee's and not mine. Since my discipline was identified as mitigation and hazard, one should use those labels cautiously.

Each panel had about 6 hours to develop a 5 year preliminary set of goals and action plan. On the last morning of the workshop each panel presented its plan to all participants and these should be refined and published within four months after the workshop. At this time I do not have copies of the preliminary plans. I served on Panel 3 and will describe some of the discussion that may have been typical for the other panels but most certainly not identical.

Highlights of discussions in Panel 3.

The cochairperson Paul Pomeroy asked everyone to introduce himself with a few words, then he allowed about 1 1/2 hours to set the background for further discussions. Kenneth Ponte was asked to describe the recent problems with the seismic provisions in the Massachusetts building code. It appeared that the Massachusetts Legislature had only adopted such a code one year ago, but then effectively nullified the implementation of the code by laying off 2000 state building inspectors. I was invited to describe what had been done in Canada regarding preparedness and mitigation and building codes, which I did. The rest of the time was taken up by concerns regarding the financing of the to be proposed scheme.

The preliminary 5-year plan adapted by Panel 3 went through 3 iterations and then the following emerged.

It is to be remembered that as a guide or suggestions the six topics mentioned earlier were to be used, however, they were largely based on the

California experience and that of Utah. For each topic goal statements were to be produced, stating which institutions and people were to be involved, the issues and activities and a 5-year schedule. This was of course a much too complex question to be answered in 6 hours, so that only a sketch without great detail was produced. The other Panels were larger, could split into committees and therefore produced more detail.

Topic 2, public sector participation, was considered to enter into most other topics and was, therefore, removed from consideration. Realizing that for simplicity a scheme should stay, if at all possible, within existing institutions, realizing that a Seismic Safety Commission had been successfully established in California and failed to succeed in Utah, it was nevertheless decided to establish "one multidisciplinary Regional Seismic Safety Council. (MRC)." The National Research Council (NRC) shall be approached to establish the MRC by approaching the state governments, universities and the private sector. It was strongly felt that this council was necessary to carry on the work proposed in the 5-year plan, and the means by which it is established will give it the needed legitimacy. Since a large part of the plan depends on politics, people who are familiar with the political process must be on the council, and to have any chance of success it must be supported by the States.

The USGS and FEMA have no interest in implementing nor running the 5-year plans in the 3 regions. Thus, they as organizers of the workshop should ask the NRC to establish the council. The date of the establishment will start the first year of the 5-year plan of panel 3.

The preliminary contents of the 5-year plan for the 5 remaining topics are as follows (I say preliminary because Paul Pomeroy and Phil McIntyre have another 3 months to polish it).

Topic 1: Hazard Awareness and Public Information

Two goals were determined.

1. Establish level of interest.
2. Increase awareness of non-scientific community.

The first one should be achieved through federal, state, private and scientific organizations.

The second through MRC.

Topic 2: Public Sector Participation: eliminated

Topic 3: Intergovernmental and Organizational Relations

Three goals were established.

1. Creation of one multidisciplinary Regional Seismic Safety Council to be established by the NRC.
2. Identify currently existing relationships.
3. Improve liaison between scientific and emergency preparedness community.

Goals 2 and 3 to be achieved through the MRC.

Topic 4: Local Earthquake Resistant Design

Here 5 goals were determined.

1. Define level of hazard in quantifiable and scientific terms.
2. Inform code officials and enforcers of hazards.
3. Implement policy that requires public facilities built to seismic codes in appropriate areas.
4. Define low cost solutions with regard to earthquake resistant design.
5. Review critical facilities in hazardous areas.

All goals to be achieved through the MRC.

Topic 5: Land Use

Two goals were proposed.

1. Identify high hazard areas.

This is to be achieved by geologic mapping by the states, federals and private sector.

2. Deliniate land use through the MRC.

Topic 6: Response to damaging earthquake

Three goals were determined.

1. Identify existing plans, through FEMA.
2. Exercise existing plans through federal, state and local agencies.
3. Ascertain need for specific earthquake plans for the northeastern U.S. through the MRC.

The other two panels presented their plans to everyone, but I do not have copies of their detailed plans. It is interesting, however, to note differences on one point. While Panel 3 thought the establishment of some sort of council to carry out the plan, as absolutely necessary, Panel 1, the central U.S., propose to accomplish all their goals through existing institutions. Finally Panel 2, the southeastern U.S., also thought a new institution was necessary, and they proceeded immediately to establish a consortium to which they elected officers from amongst themselves and appointed most other, or all other panel members, to be members of the consortium.

In spite of the differences in approach the general feeling was expressed that the implementation of 5-year plans was a necessity fraught with political problems, beset with financial uncertainty, but that it will be accomplished.

What are the implications of this workshop for Canada? In the west answers are being sought in the "Seiminar Earthquake 1981". Clearly in the east something needs to be done. It is interesting to note that in the highest risk region of eastern Canada, Baie St-Paul considers an earthquake the third most serious preoccupation of 6 hazards in terms of emergency preparedness, however, La Malbaie lists 5 hazards but does not include earthquakes among them.

Because awareness of the seismic hazard in the eastern United States was considered to be low by essentially all segments of society (excluding the participants of the workshop) a very broadly based educational program was considered necessary for the implementation of the 5-year plans.

In Canada the concern is different. In British Columbia the public may already be sufficiently concerned and the "Seminar Earthquake '81" may resolve many of the concerns municipalities in areas of zone 3 earthquake risk have regarding the mitigation for and response to a major earthquake. Results that are expected in 5-years in the eastern United States may be arrived at in shorter time in British Columbia, at least on some topics. On the other hand, "Land-use", because of its political and economic repercussions, will likely take a long time to resolve anyplace.

My personal feeling is that the awareness of the earthquake hazard in eastern Canada is substantially lower than on the west coast. Since I am not aware of a similar effort as the "Seminar Earthquake '81" being planned for eastern Canada I can not judge the level of concern or awareness at the provincial level in the east.

One recurring concern that was expressed repeatedly in group, panel and private conversations was the following. Since most participants of the workshop have a vested interest in and stand to gain from an expansion of the

activities of the 5-year action plans, they may be accused of being self-serving. The only argument against this is that it is a mandate of the USGS and FEMA to mitigate and respond to the earthquake hazard and that workshop participants are serving these goals rather than their own.

The self-serving accusation will probably not surface in Canada. The profile and exposure of work in the field is too low and the participants few in number (excepting "Seminar Earthquake '81"). As far as the mandates of the USGS/FEMA are concerned there is a difference. Although, there is a counterpart to FEMA in Emergency Planning Canada, there is no counterpart to the USGS's mandate in the assessment of the geologic hazard (nor its size, 37% of USGS funding is allocated toward earthquake hazard assessment). There is only a narrower counterpart in the EPB mandate to establish seismic risk.

In case some reader of this report likes to read the final report of USGS on the workshop, please contact me in March 1982.

WORKSHOP ON PREPARING FOR AND RESPONDING TO A
DAMAGING EARTHQUAKE IN THE EASTERN UNITED STATES

September 16 - 18, 1981
Knoxville, Tennessee
Hyatt Regency Hotel
Blount Rooms North and South and Plaza Room

FINAL PROGRAM

Wednesday, September 16

PLENARY SESSIONS - BLOUNT ROOM NORTH & SOUTH

3:00 - 3:45 PM

Welcome; statement of workshop objectives, concepts and organization; introduction of participants

Chairperson: Chuck Thiel, FEMA

3:45 - 5:00 PM

SUMMARY OF THE EARTHQUAKE THREAT

(OUTCOME: Short papers giving an overview of the geologic, engineering, societal and political aspects of the problem)

Chairperson: Ugo Morelli; FEMA

Rapporteur: Ted Algermissen; USGS

Geologic Aspects

Otto Nuttli; St. Louis University

Engineering Aspects

Bill Hall; University of Illinois

Societal Aspects

Joanne Nigg; Arizona State University

Political Aspects

Art Atkisson; University of Wisconsin

5:00 - 6:30 PM

SUGGESTED APPROACHES FOR THE CENTRAL UNITED STATES

(OUTCOME: Written statements of proposed general and conceptual approaches in 6 topical areas for improving preparedness and response in the central U.S. based on experience accumulated in other geographic areas).

Chairperson/Facilitator: Claire Rubin; the Academy for Contemporary Problems

Rapporteur: Arch Johnston; Memphis State University

TOPICS 1, 2 and 3:

- o Hazard awareness and public education
- o Public sector participation

	o Intergovernmental and organizational relations
STIMULATOR	Richard Andrews; Southern California Earthquake Preparedness Project
(5:20 - 6:00)	REACTION BY WORKSHOP PARTICIPANTS
(6:00 - 6:30)	REPORTS OF REACTION GROUPS
<u>6:30 PM</u>	DINNER AND AD HOC DISCUSSIONS
<u>Thursday, September 17</u>	PLENARY SESSIONS (CONTINUED)
	BLOUNT ROOM 2
<u>8:00 - 10:20 AM</u>	<u>SUGGESTED APPROACHES FOR THE CENTRAL UNITED STATES</u>
	Chairperson/Facilitator: John Stevenson; Structural Mechanics Associates
	Rapporteur: Clarke Mann; consulting engineer, Memphis
	TOPIC 4:
	o Local earthquake-resistant design
STIMULATOR	Anshell Schiff, Purdue University
(8:20 - 8:40)	REACTION BY WORKSHOP PARTICIPANTS
	TOPIC 5:
	o Land Use
STIMULATOR	Don Nichols, U.S. Geological Survey
(9:00 - 9:20)	REACTION BY WORKSHOP PARTICIPANTS
(9:20 - 9:40)	BREAK
(9:40 - 10:10)	REPORTS OF REACTION GROUPS
<u>10:10 - 11:40 AM</u>	<u>SUGGESTED APPROACHES FOR THE CENTRAL UNITED STATES</u>
	Chairperson/Facilitator: Eric Jenkins: FEMA
	Rapporteur: James Gurley; City of Memphis
	TOPIC 6:
	o Response to a damaging earthquake
STIMULATOR	Don Eddy; formerly Director of Region 8, FEMA/FDAA
(10:30 - 11:00)	REACTION BY WORKSHOP PARTICIPANTS
(11:00 - 11:30)	REPORTS OF REACTION GROUPS

11:30 - 12:30 PM

FORMATION OF PANELS TO DEVELOP 5 YR ACTION PLANS

Chairperson/Facilitator: Chuck Thiel; FEMA

12:30 - 2:00 PM

LUNCH AND AD HOC DISCUSSIONS
(BUFFET PROVIDED FOR PARTICIPANTS HAVING PURCHASED
TICKET)

2:00 - 6:30 PM

CONCURRENT PANEL SESSIONS TO DEVELOP 5-YEAR ACTION
PLANS

(OUTCOME: Written statements of recommended
actions to achieve specific goals in each of the 6
topical areas discussed earlier in the plenary
sessions)

BLOUNT NORTH

Panel 1 - central United States
Co-Chairpersons: Otto Nuttli; St. Louis
University and Eric Jenkins FEMA
Rapporteur: Dan Emerson; City of St. Louis

BLOUNT SOUTH

Panel 2 - southeastern United States
Co-Chairpersons: Gilbert Bollinger; Virginia
Polytechnic Institute and Jack Morgan; FEMA
Rapporteur: Joyce Bagwell; Baptist College
at Charleston

PLAZA

Panel 3 - northeastern United States
Co-Chairpersons: Paul Pomeroy; Rondout
Associates Inc. and Phil McIntyre; FEMA
Rapporteur: Walter Anderson; Maine
Geological Survey

(A BREAK WILL BE SCHEDULED DURING THE SESSIONS)

6:30 PM

DINNER AND AD HOC DISCUSSIONS

Friday, September 18

8:00 - 9:30 AM

CONCURRENT PANEL SESSIONS CONTINUE WORKING TO
FINALIZE DRAFT REPORTS AND PREPARE ORAL REPORTS

PLENARY SESSION - BLOUNT ROOM NORTH AND SOUTH

9:30 - 11:30 AM

DRAFT RECOMMENDED ACTION PLANS FOR EASTERN UNITED
STATES

(OUTCOME: A comparison of the main elements of
the draft action plans developed by the 3 panels)

Chairperson/Facilitator: Susan Tubbesing;
University of Colorado

(9:30 - 10:00)

o Report of Panel 1 - Central United States

(10:00 - 10:30)

BREAK

(10:30 - 11:00)

o Report of Panel 2 - Southeastern United States

(11:00 - 11:30)

o Report of Panel 3 - Northeastern United States

11:30 AM - 12:30 PM

EVALUATION OF DRAFT RECOMMENDED ACTION PLANS

Chairperson/Facilitator: Walter Hays, USGS

(11:30 - 12:00)

o A critical evaluation and suggestions for implementation of draft action plans, based on experience in Utah

-- Delbert Ward; Structural Facilities, Inc.

(12:00 - 12:30)

o Evaluation by workshop participants

WORKSHOP ADJOURNED

2:30 - 4:00 PM

EXECUTIVE SESSION

(Steering Committee, panel chairpersons, and rapporteurs)

(OUTCOME: To review the draft action plans produced by the 3 panels and to discuss further activities required to accomplish workshop goals)