ANNEX A
TO 1995 Nat'l Mit. Strategy

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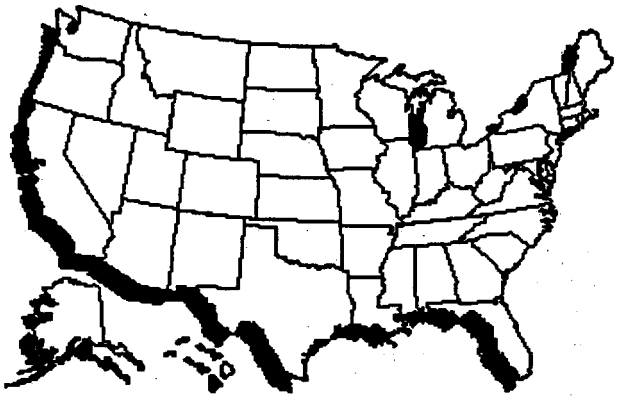
Mitigation: The National Plan and FEMA's Role



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Part One

National Pre-Disaster Mitigation Plan

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The Federal Emergency Management Agency prepared the document that follows in response to a directive contained in the report of the Conference Committee (Report 105-297) of the HUD, VA and Independent Agencies Joint Subcommittee on Appropriations. The document has been prepared utilizing the input of the Report and Commentary Pre-disaster Mitigation (the "Report"), and the Agency's lessons learned in the conduct of the pilot phase of a mitigation implementation initiative named *Project Impact*.

This document has two purposes: 1) to present a National Pre-disaster Mitigation Plan and 2) to discuss and define the role and responsibility of the Federal Emergency Management Agency under that National Plan. The National Plan is broadly drafted, in the sense that it covers all of the phases of natural hazards risk reduction implementation, from knowledge gained to knowledge applied. Notwithstanding the Agency's acknowledgement of its responsibility to advocate effective participation in the full range of objectives identified in the National Plan, FEMA's role in terms of execution is less than the whole scope.

This Document contains five sections. Section I is a short introduction to the National Plan that places it in context and offers the FEMA perspective on it. The National Plan itself follows in Sections II & III. Section IV provides a summation of FEMA's role and the approach the Agency will use in achieving the goals of the Plan. Section V is the Agency's Fiscal Year 1998 and 1999 spending plan for carrying out its responsibilities under the Plan with funds appropriated by the Joint Subcommittee for that specific purpose. The final section, Section VI describes the measurements being formulated for monitoring the Plan's progress.

1. FEMA's Introduction to the National Plan

The National Pre-disaster Mitigation Plan articulates the vision, mission, goals and objectives of this nation's effort to reduce the escalating cost of natural disasters. It is the framework in which the Federal Emergency Management Agency and other participants in the National Plan make decisions about the activities that will be supported with any resources that are appropriated specifically for "pre-disaster" mitigation.

The National Plan responds to a congressional request for a statement of National priorities and direction for pre-disaster mitigation and acknowledges the benefit of having that statement. FEMA's will use the National Plan to focus its appropriated resources for pre-disaster mitigation in an effective manner. There clearly are other Federal resources that are requested and appropriated in support of pre-disaster mitigation. FEMA advocates that this National Plan is a reasonable framework into which all Federal resources can be organized. This will achieve coordination of Federal resources and activities in the pre-disaster environment and begin to eliminate duplicative activities that are carried out due to ill defined or misinterpreted Agency roles and responsibilities. In addition, the State, local and private sectors may also orient into the National Plan their activities that are intended to result in the implementation of disaster loss reduction measures.

The essential strategic approach of this National Plan is implementation. FEMA believes its principle role and responsibility under the National Plan is the support of implementation projects at the local level. This agrees with the Ad Hoc Panel on a National Pre-disaster Mitigation Plan (hereinafter referred to as the "Panel"), which recommended that public and private sector support of mitigation implementation activities be integrated and focused at the local level.[1] FEMA believes that supporting mitigation projects will have two crucial outcomes: 1) it will directly reduce the existing disaster potential; and 2) it will leverage a desire for, commitment to and technical capability in mitigation on the part of local decision-makers. With this second outcome, a continuing practical application of policies and standards that mitigate the resulting risks of the natural hazards faced in each locality and region will be established. Long-term, sustained mitigation actions then result in a reduction of disaster losses.

The focus of approach—implementation—means that FEMA must carry out and support those actions that overcome the variety of obstacles that can arise for any business, local jurisdiction, homeowner or State. Among other considerations, the individual or organization that will carry out the implementation action will be supported in their decisions by an acknowledgement of their responsibilities for public safety, financial incentives, technical know-how, knowledge and awareness about

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1. *Pg. 11, Report and Commentary on Pre-disaster Mitigation: Ad Hoc Panel on a National Pre-disaster Mitigation Plan; Federal Emergency Management Agency, April, 1998*

hazards and how to mitigate them, support and encouragement, and a sense of community.

Using existing appropriated resources under existing programs, FEMA has developed a significant catalogue of printed and published material that provides implementers with the necessary technology to carry out mitigation actions. In addition, a number of technology transfer mechanisms have emerged that ensure an effective connection from the researcher to the practitioner. As a leader in the national pre-disaster mitigation effort FEMA will continue its existing support of user input to these mechanisms and its development of printed material on technical matters. This helps to ensure that in the technology transfer effort, implementation is sustained as the driving force.

Using implementation as the essential approach also means that the problems encountered in implementation must be resolved. User-driven, implementation focused studies are the answer. It is not FEMA's responsibility or role to support basic research. Other Agencies have this as their primary mission. However, FEMA does have a role in ensuring avenues of effective communication between the non-technical and technical communities.

FEMA also agrees with the Panel's clear recommendation that the National Plan, in order to have success, must have the benefit of Federal leadership. FEMA will sustain its commitment and effort to support mitigation implementation As recommended by the Panel, FEMA intends to continue National Plan development, carry out further external review, and expand participation. The process is beginning with this document. It should be viewed as the start, not the end.

II. The National Plan: Vision and Mission

In order to prepare the National Pre-disaster Mitigation Plan, FEMA sought input from a panel representative of the range of disciplines and experience associated with mitigation implementation. This panel assisted in the development of the framework that follows. Within that framework, the panel recommended the vision and mission statements stated below.

Vision: *The vision is a future in which all communities in the United States that are vulnerable to natural hazards have the practices, policies, and capabilities to minimize the negative impacts of such hazards on the private and public sectors.*

Mission: *The mission of the National Pre-disaster Mitigation Program is to reduce fatalities and injuries and to minimize the social, economic, and other negative effects of natural hazards by developing and promoting knowledge, practices and regulations.*

These vision and mission statements have been utilized to frame planning efforts and decision-making as it relates to the implementation of the National Pre-disaster Mitigation Plan.

III. The National Plan: Goals, Principles, Objectives and Activities

The goals, principles and objectives of the National Pre-disaster Mitigation Plan lay a foundation on which a comprehensive set of activities may be sustained.

1. Goals

There are two goals, and they are mutually supportive:

Goal #1: Implement natural hazard loss reduction practices and policies. *Work with stakeholders (to include individuals, businesses, professional associations, non-profit organizations, communities, States, and others) to carry out mitigation actions that result directly in avoided losses to existing and new construction.*

Goal #2: Improve the performance of facilities and systems in natural hazard events. *Utilize the lessons learned through implementation actions in order to: identify opportunities to improve the quality of implementation actions; develop new, improve existing and disseminate relevant information about the relative performance of structures; effectively work with decision-makers to encourage and provide incentives for the adoption of building codes and ordinances, structural designs, land use, and other mitigation policies.*

2. Principles for Program Decision-making and Prioritization

FEMA and other Federal Departments and Agencies will work with stakeholders to pursue a series of objectives that contribute to the achievement of the goals of the National Pre-disaster Mitigation Plan. The manner in which the objectives are to be addressed and the priority with which they are to be implemented will be linked to the following principles for program decision-making:

1. The proposed project will reduce losses effectively, including life, economic, social, and environmental losses;

2. The proposed project is consistent with the mission and approaches of this National Plan;

3. The proposed project, when considered with other projects, contributes to an integrated and comprehensive approach to hazard mitigation;

4. The proposed project is funded by and assigned to an agency with the requisite authority and expertise; and

5. The proposed project will produce meaningful, definable, and measurable outcomes in terms of principle #1.

These five principles are to be used to "filter" the activities, projects and initiatives that are proposed or undertaken in support of pre-disaster mitigation goals and objectives.

The following several pages outline the objectives for each of the two goals, along with a brief description of what is intended by each objective, There is also an illustrative list of potential projects. Actual activities and projects that will be supported and carried out by FEMA (or any other contributor to the National Plan) should be reviewed within the context of the principles for program decision-making (above):

3. Objectives and representative activities

In the section that follows, FEMA presents the full range of objectives that contribute to the achievement of the goals. The objectives have descriptive paragraphs following each and illustrative sets of activities are also included. While the specific activities that would be undertaken should be subjected to the principles, the core of the objectives is implementation.

Goal #1: Implement natural hazard loss reduction practices and policies.

Objective-A. Encourage and support the development of disaster resistant communities.

FEMA, in conjunction with other Federal Departments and Agencies, will actuate, facilitate and support efforts at the local level to identify community vulnerabilities to natural hazards, establish priorities on how they should be addressed, and take action to reduce that risk.

Examples of potential projects include:

- Initiating and supporting the development of at least one model disaster resistant community per State in FY 1998.

- Facilitating the establishment of partnerships between public and private sector organizations that support mitigation goals at the local level.

- Leveraging existing resources and expertise found at the Federal, State, local, and private sector levels to address local risk-reduction needs and priorities, and "packaging" them so as to provide incentives to stakeholders at the local level to provide contributions of their own and to undertake mitigation action.

- Enhancing coordination between new and established Federal programs and initiatives promoting mitigation goals.

Objective-B. Identify and implement means to effectively motivate the public to take actions to mitigate natural hazard risks.

FEMA, in conjunction with other Federal Departments and Agencies, will work with other key stakeholders to identify and implement strategies that effectively motivate the public to take mitigation actions, to include the packaging and delivery of mitigation information, technical assistance, and incentives at the local level. The objective is to enhance the market for the Mitigation "product", and for the elements (e.g., education, incentives, technology) that support it.

Examples of potential projects include:

- Developing awareness, education, and marketing campaign for end-user groups which effectively encourages mitigation action and promotes the development of more disaster resistant communities.

- Providing targeted financial incentives and technical assistance to key stakeholder groups (e.g., States, local governments, and non-profit organizations) to encourage the development or enhancement of mitigation capabilities, and actions that support local needs.

- Communicating the availability of mitigation incentives to those at the State, local, and private sector levels who are most likely to carry out or influence local and individual decision-making.

- Facilitating the development of coalition-building skills at the local level to broaden the support for adoption of mitigation measures mitigation in communities.

Objective-C. Create and leverage incentives for public and private sector loss reduction actions.

FEMA, in conjunction with other Federal Departments and Agencies, will work to convince public and private sector entities to utilize new and existing resources and mechanisms to promote hazard mitigation objectives. In addition, FEMA, in conjunction with other Federal Departments and Agencies, will review and, to the extent practicable, focus existing programs, activities, and resources in order to maximize incentives for local communities, businesses, and individuals to reduce potential losses.

Examples of potential projects include:

- Encourage and advocate that financial institutions recognize the financial risks they face as a result of natural hazards, and that they provide mitigation incentives in order to lessen their exposure to that risk (e.g., establish bond ratings that reflect natural hazards risks and mitigation, provide loans for mitigation activities, etc.).

- Establish and support mitigation-based links between banks, insurance companies, and communities to encourage the development, enhancement and delivery of risk-based products.

- Develop and sustain a National Business Alliance focused on mitigation.

- Work with realtors and others to develop recognition that disaster resistant structures can be used as a factor in promoting and valuing real estate.

Objective-D. Develop and provide information to decision-makers and professionals on natural hazards and loss reduction measures.

FEMA, in conjunction with other Federal Departments and Agencies, will work with other key stakeholder groups (including States, non-profit groups, professional organizations and the private sector) to develop and disseminate mitigation training, data, and information about natural hazards and loss reduction measures. These groups will be encouraged to participate in the delivery of training, data, and information.

Examples of potential projects include:

- Continuing to develop and disseminate data and information on the costs, benefits and effectiveness of mitigation measures.

- Developing plans, guidance, and other information to decision-makers and professionals in order to provide them with the tools they need to carry out natural hazard risks mitigation.

- Seeking to broaden critical players in implementation of mitigation strategies to include economic development, building owners, manufacturers, financial institutions, small businesses, etc.

Objective-E. Provide technical assistance to local and State governments for implementing loss reduction measures.

FEMA, in conjunction with other Federal Departments and Agencies will draw upon technical staff and resources (especially key stakeholder groups possessing appropriate expertise and experience) to provide assistance and information that facilitates implementation to building officials, architects, and engineers (in the public or private sector) who are responsible for implementing mitigation actions.

Examples of potential projects include:

- Utilizing expertise found within Federal, State, local, and professional organizations to develop, update, and disseminate technical manuals, guidelines, and standards relating to natural hazards loss reduction measures and practices.

- Facilitating "peer-to-peer" exchanges of local officials with relevant experience and expertise in implementing community loss-reduction measures.

- Focusing the delivery of Federal technical assistance in communities undertaking mitigation initiatives.

Objective-F. Support mitigation training and education for professionals and practitioners (design professionals, land use planners, emergency management personnel, and facilities managers).

FEMA, in conjunction with other Federal Departments and Agencies, can provide financial support, technical assistance, and/or staff resources to develop and offer mitigation training and educational opportunities for professionals and practitioners from the public and private sectors. FEMA, in conjunction with other Federal Departments and Agencies, can also encourage (through both mutual agreements and/or the provision of financial and other incentives) other stakeholder groups and professional associations to facilitate and support mitigation training through their own organizational efforts.

Examples of potential projects include:

- Developing and providing educational courses on mitigation programs and activities at FEMA's Emergency Management Institute, at the State and local levels, through correspondence courses, and through the utilization of professionals and other private sector groups/representatives as delivery mechanisms (i.e., "train-the-trainer").

- Developing, providing, and/or funding education courses on state-of-the-art mitigation practices, standards, and technologies to professionals and practitioners.

- Financially supporting model code organizations and other selected partner groups so that they will sponsor/conduct training for key stakeholder groups.

Objective-G. Discourage social and economic activities that create vulnerability to natural hazards.

FEMA, in conjunction with other Federal Departments and Agencies, will work with key stakeholders and decision-makers to raise their understanding of how human decisions and activity effect natural hazards risk, and the options they have to minimize or eliminate potential negative consequences. Efforts will also be taken to identify and work with groups and organizations that advocate risk reduction principles to expand the network of those participating in and promoting mitigation at the State, local, and private sector levels.

Examples of potential projects include:

- Promoting a comprehensive all-hazards approach to natural hazard mitigation for Federal actions and Projects.

- Providing technical assistance to States and communities through existing programs (such as the National Flood Insurance Program, National Earthquake Hazards Reduction Program, National Dam Safety Program, and the National Hurricane Program).

- Coordinating with public interest groups and others who advocate growth management goals that support mitigation results.

Objective-H. Advocate public and private decision-making based on the use of hazard identification and risk assessment methods and technologies.

FFMA, in conjunction with other Federal Departments and Agencies, should provide States, communities, the private sector, and others with the tools they need to identify and assess natural hazards risks by investing resources in and applying expertise toward the development and dissemination of hazard identification and risk assessment methods and technologies.

Examples of potential projects include:

- Continuing Federal efforts to improve natural hazards characterization and mapping.

- Working with States and localities to obtain rapid and reliable data on natural hazards events and natural hazards-Induced damages.

- Conducting a Federal effort to work with States, communities, non-profit organizations, and the private sector to increase their understanding of their exposure to natural hazards risk, and how loss estimation and risk assessment tools can facilitate a planning and decision-making process that minimizes that exposure.

- Developing and deploying a consensus-based multi-hazard loss estimation tool.

Objective-I. Implement policies and practices that reduce the vulnerability of Federally-owned, financed, and leased facilities and infrastructure.

Through adherence to existing Executive Orders and guidance, and the enhancement of inter-agency technical assistance, FEMA, in conjunction with other Federal Departments and Agencies, will review their actions and policies and take steps to reduce risks posed to Federally owned or controlled facilities and infrastructure.

Examples of potential activities include:

- Facilitating adherence to relevant Executive Orders (E.O.'s) through increased interagency dialogue and the provision of appropriate technical assistance to those departments and agencies in need of additional support. Relevant E.O.'s include:
  - E.O. 11998: Floodplain Management;
  - E.O. 11990: Wetlands Protection;
  - E.O. 12699: Seismic Safety for Federal and Federally-Assisted or Regulated New
  - Building Construction;
  - E.O. 12941: Seismic Safety of Existing Federally-Owned or Leased Buildings
- Strengthening implementation linkages among Federal agencies with respect to mitigation measures and standards.

Objective-J. Encourage policies and practices that reduce the vulnerability of State-owned, financed, and leased facilities and infrastructure.

FEMA, in conjunction with other Federal Departments and Agencies, will provide technical assistance and advocate the adoption and enforcement of hazard-resistant designs, policies, and practices at the State level, and will work with State officials and legislators to encourage them to apply mitigation standards and practices to State-owned facilities and infrastructure.

Examples of potential projects include:

- Communicating the "state-of-the-art" in structural design and standards with State counterparts, and encouraging their utilization in new construction and retrofitting efforts.
- Working with State decision-makers to raise their awareness of the linkage between the location and design of State-owned and financed facilities and infrastructure, and their State's risk and exposure to natural hazards.
- Providing technical and/or limited financial support for the development of state mitigation plans.
- Establishing State funded hazard mitigation accounts

Goal #2: Improve the performance of facilities and systems in natural hazard events.

Objective-K. Encourage the transfer of mitigation technology to the end user.

In order to increase the effectiveness in which mitigation technologies are transferred to the end-user, FEMA, in conjunction with other Federal Departments and Agencies,

should encourage the development of technologies that address end-user needs. Efforts should be made to support activities that utilize or build upon communication channels that already exist through key partner organizations (such as code organizations and professional associations) to reach wide audiences and transfer mitigation technologies to the end-user.

Examples of potential projects include:

- Supporting (through partnerships or limited financial support) organizations and institutions that promulgate mitigation strategies and measures that substantially conform with statutory, regulatory, or policy-issued mitigation goals.

- Participating in partner group conferences and events to communicate and disseminate information about state-of-the-art mitigation technologies.

- Encouraging research agencies and institutions to include end-user group representation in the development of new mitigation research to obtain their buy-in and increase the likelihood that they will communicate and apply results.

Objective-L. Improve the quality of planning, design, and construction practice.

The FEMA, in conjunction with other Federal Departments and Agencies, should provide leadership, technical support, and/or limited financial incentives to promote the incorporation of state-of-the-art mitigation principles and practices into community planning, design and construction activities. Efforts should also be made to educate organizations, which support community planning goals and activities, to encourage them to incorporate mitigation into their ongoing projects, guidance, and activities.

Examples of potential projects include:

- Establishing partnerships among States, academic institutions, professional, industry, and building trade associations, and the Federal Departments and Agencies that enhance the quality of mitigation education and professional development.

- Promoting the concept of multi-objective planning at the local level.

- Providing technical support to community planning groups and local officials interested in pursuing community sustainability through mitigation action.

Objective-M. Support efforts to improve the development, adoption and enforcement of building and planning codes and standards that relate to natural hazards.

FEMA, in conjunction with other Federal Departments and Agencies, should provide leadership, technical assistance, and/or financial support to organizations that promote effective mitigation practices through the improvement of mitigation plans, codes, ordinances, and standards.

Examples of potential projects include:

- Supporting and encouraging the development and validation of mitigation alternatives, and working with partner organizations to ensure validated alternatives become part of state-of-the-art codes, standards, and practices.
- Providing technical and limited financial support to model code organizations to assist in the continued development of loss reduction criteria in the model building codes.
- Providing technical assistance and communicating support for the adoption and enforcement of modern model building codes and consensus standards by localities and States.

Objective-N. Support and encourage the validation of mitigation technologies.

The Federal Departments and Agencies should participate in the validation of mitigation technologies, with emphasis on those that help address high-priority problems and needs identified by the end-user community.

Examples of potential activities include:

- Utilizing the post-disaster environment as an opportunity to determine the success of mitigation measures and identify areas for continued improvement.
- Institute a study on needs and availability of testing facilities related to wind and develop an action plan to satisfy the needs.
- Working with partner groups to encourage the development of regulatory and non-regulatory environments that are conducive to the development and introduction of new mitigation technologies.

Objective-O. Advance the understanding of natural hazards phenomena and their effects.

Federal departments and agencies should provide financial and technical support to improve our nation's understanding of natural hazards and their effects. This information and knowledge should then be communicated to and utilized by key stakeholders to further develop and validate mitigation codes, standards, and practices.

Examples of potential activities include:

- Encouraging appropriate Federal and State agencies, the academic community, and the private sector to pursue research and development activities that provide a better understanding of natural hazards phenomena.

- Supporting and/or facilitating efforts to quickly incorporate the results of natural hazards research into state-of-the-art risk assessment tools and construction practices.

- Providing information learned about natural hazards risks and effects to the academic community through public education, formal training opportunities, and outreach.

Objective-P. Advocate research based on user needs.

The Federal government should work within its own departments and agencies and with private sector and non-profit research institutions to stress the importance of user-driven, problem-focused mitigation research. Agencies with appropriate authorities and expertise should then direct much of their mitigation research funding and support to address end-user research needs.

Examples of potential activities include:

- Encouraging the development of user-driven partnerships in order to determine overall directions for research efforts.

- Establishing and utilizing an advisory group to gather information from the end user regarding their need for new applied research and development.

- Incorporating end-user research priorities into the decision-making process that guides which research projects are supported by appropriate departments and agencies with relevant authorities and expertise.

IV. FEMA's Activities under the National Plan

1. Emphasis

The preceding National Pre-disaster Mitigation Plan conforms to the results of a study, review and analysis of various mitigation alternatives. The Ad Hoc Panel, which was referred to earlier in this document, was convened by FEMA for the purpose of carrying out that review and analysis. Under the National Plan, FEMA will concentrate resources on supporting activities and projects that:

- Produce measurable results.
- Support local pre-disaster mitigation action and create ongoing commitments to mitigation and loss reduction policies.
- Make implementation the core strategy of pre-disaster mitigation.
- Create a market for pre-disaster mitigation knowledge, technology and support.

These activities and projects will focus on:

- Reducing the existing disaster potential, particularly in public infrastructure when practicable;
- Utilizing financial and technical support resources to leverage disaster resistant construction and growth in communities;
- Seeking effective partnerships with governmental, private sector and non-profit organizations that have vested interests in and a fundamental commitment to disaster resistant communities;
- Demonstrating leadership in coalition building in government and in support of disaster resistant communities; and
- Ensuring that the information and technology needs of the implementation community are communicated to those Federal, State, private or academic institutions with the role and responsibility to respond to them.

2. FEMA's Approach to the National Plan

FEMA's approach to carrying out its roles and responsibilities under the National Pre-disaster Mitigation Plan will be to:

- Give priority to activities that directly reduce losses;
- Work interactively with Federal, State, and local governments, and with the private sector, to accomplish objectives and ensure that effective mitigation techniques are communicated to decision-makers;
- Coordinate the multiple initiatives and agencies with overlapping roles in implementation in order to achieve consistency and maximize results and assure the delivery of Federal programs in a manner that improves the achievement of mitigation at the local level; and
- Evaluate projects periodically to assess results and take appropriate action to sustain, revise, or discontinue them as needed.

Given this approach to pre-disaster mitigation, FEMA makes local implementation projects and activities its highest priority under the National Plan. Implementation projects and activities presently include the Disaster Resistant Communities Initiative (known as "*Project Impact*") and the Flood Mitigation Assistance Program (FMA). These initiatives address locally refined mitigation implementation priorities and use Federal funding to leverage investment by other Federal agencies and by the State, local, and private sectors to achieve pre-disaster mitigation. The strength of these initiatives relies on continued strong support from the Congress.

FEMA's concentration on implementation activities is not intended to downplay the contributions that research results can make to mitigation. However, there is an enormous disparity in the level of Federal resources available for research and development versus those available for implementation. Research and technology development and transfer do play a supporting role in improving the implementation of pre-disaster mitigation. But there is sufficient knowledge now to carry out the implementation of mitigation measures, Moreover, the individuals and organizations, which conduct research and technology development and transfer, already have significant Federal and private resources to support them. There are far fewer resources available for implementation. Therefore, we would not propose that FEMA pre-disaster mitigation funds be used to support research and development. Other FEMA funding streams, such as NEHRP, have been and will be utilized to contribute limited amounts to development of implementation solutions at the community level.

3. Implementation Overview: *Project Impact* Criteria and Process

At the core of FEMA's activities under the National Pre-disaster Mitigation Plan is the designation and development of *Project Impact* communities across the country. *Project Impact* evolved from a number of forums the FEMA Director conducted with a broad range of public interest groups and organizations concerned with natural disasters, their costs, and their impacts. These forums, called roundtables, resulted in the identification of three major needs that would supply three important outcomes:

1) Conduct a long-term, nationally profiled, public awareness campaign on the presence of natural hazards, the avoidable costs they take from the taxpayer, and the means to avoid those costs. The outcome of this would be a larger and more robust "market" for natural hazards risk mitigation;

2) Establish a funding source at the national level that would support the retrofit or rehabilitation of engineered, at-risk public structures at the community level. The outcomes of this, in addition to reduced disaster potential, would be a demonstration of mitigation and a leveraging of additional resources into community disaster resistance; and

3) Establish in the private sector [on the basis of avoided private sector losses] both a recognition of the importance of a functioning infrastructure to the business

community as well as the resources that support the rehabilitation of the minimally engineered structures, which often form the backbone of the residential and small business sectors of any community. The outcome of this would be stronger, more sustainable communities and a leveraged investment in disaster resistant new construction.

FEMA designed *Project Impact* to respond to these needs and attain these outcomes. The Agency intends to conduct forums in the future with its "roundtable" participants in order to provide them with information on the progress of the *Project Impact* initiative, obtain further refinement to the community selection procedures and criteria, and encourage broader, non-Federal participation in the support of disaster resistant communities.

The Agency designated seven *Project Impact* pilot communities and worked with those pilots to learn the best features of the initiative and to revise or discard those features not working as intended. FEMA will designate a total of 50 communities, one in each State, by the end of FY98 and another 50 communities in FY99. FEMA will provide funding in the form of grants for mitigation actions and support for a local *Project Impact* coordinator in 30 communities in FY98 and in another 55 communities in FY99.

In identifying partner communities under *Project Impact*, FEMA followed the criteria below:

- past history of natural disaster activity and especially the potential for natural disaster;
- high hazard from earthquake, hurricane wildfire, fire or flood;
- evidence of a commitment at the local government level to promote mitigation practices through the investment of local funds and the adoption and enforcement of local building, zoning, and planning codes, laws, and regulations;
- interest by the private sector to enter into a partnership to promote mitigation;
- proposed (or probable) community projects will reduce losses effectively, including life, and losses that are economic, social and environmental;
- when considered with other projects, these projects contribute to an integrated approach to hazard mitigation in the community;
- projects undertaken in the community will produce meaningful, definable and measurable outcomes.

For the identification of communities for the pilot phase, FEMA consulted with its State emergency management partners to obtain a complete list of possible pilots. The

Agency then convened a panel of management and staff to review the recommendations against the criteria above. All subsequent communities to be identified will be communities that FEMA's State partners have themselves identified, using the criteria. This modification to the procedure allows the Agency to continue defining and refining an optimum role for States to carry out in supporting *Project Impact* communities. In FY99, FEMA will again depend upon its State emergency management partners, and others, in making designations for *Project Impact* communities.

Pre-disaster Mitigation Fund (PDMF) expenditures in support of these communities and in support of related FEMA pre-disaster mitigation activities under the National Pre-disaster Mitigation Plan are described in the section that follows. The amount of PDMF resources a community receives is influenced by the specific project(s) a local government and the community's private Sector agree to conduct and the extent to which FEMA's funds are leveraging other resources into the community's pre-disaster mitigation efforts. For example:

- Deerfield Beach, FL, a pilot community, received approximately $500,000 to retrofit their high school, which serves as their primary evacuation shelter, and this was matched by the private sector.

- Pascagoula, MS, another pilot community. FEMA provided $300,000 to start up a planning process for prioritizing their vulnerable structures and to initiate a low interest loan program for Individual and small business retrofit, and

- Seattle, Washington, *Project Impact* will, among other activities, allow about 2,000 homeowners to retrofit their homes using self-help classes, prescriptive home retrofitting plans, an expedited permit approval process, and mitigation loan packages. The partners making the retrofit program possible include: Washington Mutual Bank, Seafirst Bank, Master Builders Association, SAFECO, Phinney Neighborhood Association, University of Washington, and the City of Seattle Department of Construction and Land Use.

The ability of a community to match FEMA funding from the private sector is instrumental in the level of funding it receives from FEMA. A tentative limit of $1 M has been used, to this point, for any one community to receive from the PDMF.

4. Implementation Overview: Additional Support for Actions

A mitigation implementation effort that is of critical importance is the recently created Flood Mitigation Assistance (FMA) grant activity. This grant mechanism, which is part of the National Flood Insurance Program (NFIP), is designed to address pre-disaster mitigation needs and reduce the risk of flood losses to the most at-risk structures in the floodplain. Each State is eligible annually for funds to retrofit, remove or relocate vulnerable structures that are currently in a floodplain (with emphasis on structures that have experienced repetitive flood insurance losses). Sites and projects selected by the

State are reviewed by FEMA for compliance with applicable Federal law and regulations. FEMA is encouraging States to review designations for FMA assistance to maximize the benefits of a *Project Impact* designation.

Continued emphasis will also be placed on encouraging the development, adoption, and enforcement of hazard-resistant building codes and standards. FEMA will continue its support of model code organizations' work in mitigation by providing technical assistance and funding that aid the incorporation of natural hazard loss reduction criteria into model building codes, and train officials and professionals on how such guidelines can be followed. FEMA will also work with communities and States through the NFIP and other mechanisms to encourage and facilitate their adoption of model building codes and consensus standards that support disaster resistance.

FEMA presently supports (apart from Pre-disaster Mitigation Funds) a variety of initiatives in land development planning, building sciences and other problem-focused research and development arenas. Continuing these activities is important since their outcomes (or products) form the basis for effective hazard resistant land-use planning and the design and construction criteria used in hazard resistant structures and infrastructure. Examples of some new and continuing activities in this area include but are not limited to:

- The FEMA/NEHRP initiative to identify seismic engineering techniques and considerations for Steel Frame Moment Resistant Buildings;
- Support of the development of the new International Building Code through the provision of mitigation technical assistance, funding efforts to incorporate NEHRP Recommended Provisions in model codes, and funding efforts to ensure that model codes conform to the regulatory requirements of the National Flood Insurance Program;
- Continued development and distribution of technical guidance materials reflect known mitigation techniques and that support the user community with practical, implementation oriented information;
- Support to the periodic revision of national consensus standards related to hazard mitigation,
- Development of a design for an in-residence shelter for homes in areas at high risk from tornadoes;
- Continued post-disaster field investigation and analysis; and
- Continued development of land-use planning guidance.

FEMA also applies limited funds to support technology transfer activities that are focused on implementation requirements. Some of the academic institutions and regional consortia organizations that have received such support include:

- The Natural Hazards Research and Applications Center at the University of Colorado-Boulder;
- The Central U.S. Earthquake Consortium in Memphis, Tennessee;
- The National Center for Earthquake Engineering Research at the State University of New York in Buffalo;
- The New England States Emergency Consortium;
- Memphis State University;
- The Western States Seismic Policy Council;
- Clemson University;
- The Southern California Earthquake Center headquartered at the USC campus;
- The California Universities in Research of Earthquake Engineering headquartered at the Richmond facility of Cal-Berkeley; and
- Texas Tech University

The focus of this document on "pre-disaster" mitigation should not obscure the significant amount of mitigation implementation carried out by FEMA in the aftermath of natural disasters declared by the President under the Robert T. Stafford Disaster Relief and Emergency Assistance Act. The mitigation activities carried out under Sections 404 and 406 of the Stafford Act contribute meaningfully to the achievement of the goals and objectives of the National Plan. FEMA will continue its efforts to streamline the execution of these activities, and will work to more effectively create incentives for pre-disaster mitigation in a post-disaster environment.

V. FY 98 & 99

1. Table of Planned Expenditure from Pre-disaster Mitigation Fund in Fiscal Years 1998 & 1999:

Activity	FY 98 (in K's)	FY 99 (In K's)
• **Local Mitigation Actions**		
30 communities @ average of $700,000	$21,500	
55 communities @ average of $700,000		$38,500
• **Local *Project Impact* Coordinators**		
30 coordinators @ $65,000	1,950	
55 coordinators @ $65,000		3,575
• **Regional Projects**		
2 reg. projects @ $150K per project	300	
4 reg. projects @ $150K per project		600
Mitigation actions in 2 @ $700K per reg.		1,400
• **Partnership Initiatives**	250	725
• **National Awareness Campaign**	200	500
• **Implementation Solutions**	250	300
• **Program Evaluation**	250	250
• ***Project Impact* Needs Conference (Fall 1998) & National Mit. Conference (Spring 1999)**	300	400
• **State and Local Training**	1,250	
• **State Grants**	2,500	
TOTAL	$25,000	$50,000

2. Narrative for Planned FY 98 & 99 Expenditures from Pre-disaster Mitigation Fund: Activities & projects

Local Mitigation Actions

The majority of funds from the PDMF in FY98 and FY99 will be spent on direct mitigation actions that are identified, prioritized and implemented at the community level. These actions must have a direct impact on reducing the identified risks in a community. FEMA will provide 30 communities in FY 98 and 55 communities in FY 99 an average of $700,000 each to undertake such activities as an infrastructure retrofit project, a critical facility retrofit project, a home or small business retrofit program, etc.

FY98 - 30 communities @ average of $700,000 ..... $ 21,500,000
FY99 - 55 communities @ average of $700,000 ..... $ 38,500,000

Local *Project Impact* Coordinators

In support of community coalition building and risk reduction efforts, FEMA will provide seed funding to designated *Project Impact* communities to support the salary and expenses of a full-time coordinator. Continuing support of the coordinator is a responsibility of the local government and its private sector partners. Coordinator responsibilities will include conducting community efforts in building partnerships, conducting risk identification and vulnerability assessments and building public support. In FY98 funding will be provided for coordinators in 30 communities and in 55 communities in FY99. The Federal standard of $65,000 per year was used to estimate the annual cost per coordinator.

FY98 - 30 coordinators @ $65,000 ..... $ 1,950,000
FY99 - 55 coordinators @ $65,000 ..... $ 3,575,000

Regional Projects

Funding for "regional projects" will support pre-disaster mitigation activities that bring together communities, businesses and interest groups to implement mitigation actions within an area defined by geographic rather than political boundaries. The regional "boundaries" will be principally defined by the hazard being addressed. Thus for the flood risk, "watershed" would equal "region". In FY98 funding will be provided for 2 regional projects at a cost of $150,000 per project. In FY99, funding will be provided for 2 new projects, as well as continued funding for the FY 98 projects. Additionally, in FY99, funding for mitigation actions in the first 2 existing projects will be provided at a cost of $700,000 per project. An example of the regional project is the New York State Joint Loss Reduction Project. The State of New York has identified five sub-State, or regional, components, based on the natural hazards confronting them, and is working with each region to form public/private partnerships that conduct joint emergency

management activities including pre-disaster mitigation. FEMA has provided some previous fiscal year funding for the second phase of this project.

FY98 - 2 regional projects @ $150,000 per project $300,000
FY99 - 4 regional projects @ $150,000 per project $600,000
FY99 - Mitigation actions in 2 communities
@ $700,000 per community..... $1,1400,000

Partnership Initiatives

Funding will be provided in both FY98 and FY99 for partnership initiatives that promote pre-disaster mitigation actions among targeted user groups. In FY98, funding will be provided to design a *Project Impact* initiative that promotes pre-disaster mitigation actions within the Nation's university communities. This will result in a definition of methods to better protect the Federal government's investment in research capabilities at university facilities across the nation. The project will include the National Science Foundation, the Department of Transportation arid other Federal research agencies, FY99 funding will further support the University Program and other partnership initiatives.

FY98 - planning and design ..... $ 250,000
FY99 - planning and design ..... $ 725,000

National Awareness Campaign

Funding will be provided in both FY98 and FY99 to promote *Project Impact* and pre-disaster mitigation in a variety of national, State, regional and local media. Funding will also be provided for development, production and distribution of educational materials concerning *Project Impact* and pre-disaster mitigation.

FY98 ..... $ 200,000
FY99 ..... $ 500,000

Implementation Solutions

Funding will be provided In FY98 and FY99 for projects that focus on problems surfaced by end users in communities participating in *Project Impact*. These studies could include economic impact analyses of identified risks, studies of mitigation techniques and actions, etc. FEMA is currently supporting, for example, an effort to examine the range factors that drive economic decisions at the community level in order to identify the most appropriate points in that continuum for mitigation decisions to be incorporated.

FY98 ..... $ 250,000
FY99 ..... $ 300,000

Program Evaluation

Funding will be provided in FY98 and FY99 for the systematic evaluation of *Project Impact* and the effectiveness of pre-disaster mitigation spending. Existing and future *Project Impact* communities and FEMA will refine and improve program systems and deliverables using the results of these annual evaluations.

FY98 ..... $ 250,000
FY99 ..... $ 250,000

Project Impact Needs Conference (Fall 1998) and National Mitigation Conference (Spring 1999)

Funding will be provided in FY98 and FY99 for staffing, design and logistics support for two planned conferences. The *Project Impact* Needs Conference, planned for the Fall 1998, will highlight *Project Impact* activities to date and will include officials from the existing *Project Impact* communities, Federal officials from FEMA and other departments and agencies, academics, Project impact partners from the private sector and other invitees. The National Mitigation Conference scheduled for the Spring 1999, will be a large-scale event open to any individual, group or organization interested in pre-disaster mitigation. Its goal is to highlight the best practices in disaster resistant communities, coalition building and promoting private sector participation. It is anticipated that partnership and sponsorship fees and contributions will complement this funding.

FY98 ..... $ 300,000
FY99 ..... $ 400,000

State and Local Training

Funding in FY99 will be provided to support training for State and local officials in building partnerships, identifying risks, conducting vulnerability assessments and building public support for mitigation and *Project Impact*.

FY99 ..... $ 1,250,000

State Grants

Funding will be provided in FY99 directly to State emergency management agencies to fund administrative activities in support of identifying and working with *Project Impact* communities and expanding the participation in *Project Impact* to include other agencies within the State government. A total of $50,000 will be provided to each State agency.

FY99 - 50 grants @ $50,000 per State $2,500,000

Total Funding

For FY98 a total of $25 million will be disbursed. Of this total, 96% ($24 million) will be provided directly to the States and local communities. In FY99, 97% ($48.55 million) of all funds will go directly to the States and local communities. In FY98 86 % ($21.5 million) of all funds will fund mitigation actions. In FY99 80% ($39.9 million) of all funds will be fund mitigation actions.

V. The National Plan: Measuring Performance

Measuring progress toward achievement of the goals of the Pre-disaster Mitigation Program will require a documented methodology and quantification of the existing and resulting change in the potential for deaths, injuries and property losses from natural hazard events. Emphasis will be placed on measuring impacts to the public infrastructure that accounts for considerable expenditures under the Disaster Relief Fund, potential losses in utility and transportation systems will also be needed. The more elusive but equally important "indirect" loss estimates, such as social impact and environmental losses, will be considered in the measurement process.

1. National and Regional Measures

In order to achieve the measurements, FEMA will work with State, local and private sector partners to develop and utilize several methods that will measure short- and long-term results at the local, regional and national level. Among others, FEMA will measure and determine trends relative to:

- The increase in the number of States and localities that adopt hazard-resistant building codes and ordinances and the quality of their enforcement;
- The increase in number of localities that implement land-use or construction permitting processes consistent with hazard reduction principles;
- The State and local laws on natural hazard risk disclosure; and
- Changes in community participation in the National Flood Insurance Program and relevant migration of flood policies from subsidized to actuarial rating.

FEMA will continue to expand implement a nationally applicable loss estimation model known as "HAZUS" (Hazards U.S.). This model will provide baselines of probable future losses (direct and indirect), and permit comparisons, periodically, of probabilistic losses. The modeling results can demonstrate, for example, the probable impact of the adoption and enforcement of updated building codes and/or the implementation of mitigation projects. The earthquake module of this loss estimation methodology is

already available (with baselines expected to be produced in FY 1999), with wind and flood modules under development at this time.

2. Project/Community Measures and Indicators

FEMA will continue to evaluate communities after disasters occur to establish the effectiveness of mitigation measures taken and whether there was a reduced need for response and recovery activities. The mitigation actions performed after the mid-west flood of 1993, and the subsequent reduction of losses that were demonstrated in the 1995 flood of the same geographic region, provide evidence that the effectiveness of mitigation can be documented. The results gathered after new disasters occur in the areas in which projects were completed will be shared with other Federal, State, local, and private sector partners.

FEMA is presently working with the University of Delaware/Disaster Research Center to conduct an evaluation study of effectiveness of *Project Impact* in pilot communities. The study has four outputs:

1. describe and document the processes through which *Project Impact* pilot communities developed their plans and objectives under the initiative;

2. monitor and document the progress pilot communities are making toward achieving their stated goals;

3. monitor and document the mitigation partnership in the community that is precipitated by *Project Impact*;

4. identify factors that contribute to successful implementation in the pilot communities; and

5. make recommendations and point out factors that FEMA should take into account in implementing the program on a national scale.

FEMA will use this data to modify *Project Impact* implementation. We also expect to define specific indicators within each *Project Impact* community that can demonstrate mitigation is working and genuine risk reduction is occurring in the existing and new construction of the community.

END

Part Two

Ad Hoc Panel Report

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March 30, 1998

Hon. James L. Witt
Director Federal Emergency Management Agency
500 C Street, SW
Washington, D.C. 20472

Dear Director Witt:

The ad hoc panel, which you formed to assist FEMA in the analysis of various mitigation strategies and to peer review a National Pre-disaster Mitigation Plan, has completed its work. I am attaching its report.

In 1997, Congress provided $30 million for pre-disaster mitigation efforts. The Joint Explanatory Statement of the Committee of Conference called for a "formal needs-based analysis and cost/benefit study of the various mitigation alternatives," with the results of such analysis and study being "incorporated into a comprehensive, long-tem National Pre-disaster Mitigation Plan." The Conference Statement also provided that after the Plan was developed it should be "independently peer-reviewed and submitted to the Committee on Appropriations" by March 31, 1998.

Draft released 3/31/98

The panel heard presentations on a number of pre-disaster mitigation alternatives including *Project Impact*, the HomeSaver Project of the Partnership for Natural Disaster Reduction and the rapid deployment-technologies concept of the Centers for Protection Against Natural Disaster (CPAND) as well as on the National Flood Insurance Program. It is clear to the panel that for every dollar spent in pre-disaster mitigation, there are quantifiable and multiple savings to individuals, businesses and the taxpayers in the form of reduction in losses. However, it was impossible for the panel to conduct a formal needs-based analysis and cost/benefit study of particular mitigation alternatives by the Congressional deadline of March 31, 1998.

Nevertheless, the panel developed a statement of pre-disaster mitigation principles and strategies that reflected its understanding of the attributes and priorities by which all pre-disaster mitigation alternatives should be measured and that would be essential elements in and criteria for any comprehensive long-term National Pre-disaster

Mitigation Plan. The panel's primary conclusion was that the highest priority in mitigation efforts must be direct implementation at the local level.

Another basic conclusion of the panel was that the attention of Congress and the Administration to the need for adequate funding of pre-disaster mitigation, evidenced by the 1997 appropriation, is welcome and necessary to reverse the current course of inadequate funding for such mitigation efforts. While continuing efforts should be made to improve knowledge of natural disaster hazards and their mitigation, it is essential that our nation allocate the clearly inadequate resources that are currently allotted to disaster mitigation to direct implementation of existing information and techniques so as to immediately reduce the likelihood of loss of life and property.

The panel also determined that these principles and strategies should be utilized by Congress and federal agencies in all evaluations of particular pre-disaster mitigation approaches and projects so as to maximize limited available resources.

On the basis of the panel's statement of principles and strategies, FEMA prepared its Pre-disaster Mitigation Plan. The panel then peer-reviewed the Plan and suggested refinements that would make even more likely the attainment of the primary goal of mitigation. With these refinements, the panel found that the Plan fully incorporated and reflected the panel's recommended principles and strategies and met the Congressional mandate for a long-term National Pre-disaster Mitigation Plan.

The panel distinguished itself by developing principles and strategies by which proposed pre-disaster mitigation approaches and projects should be evaluated and I am proud that you gave me the opportunity to participate in its efforts. However, the panel's contribution to our nation's efforts to reduce losses from natural disasters will be wasted unless its recommendations are implemented at the highest levels of government.

Sincerely,

George K. Bernstein

Encl.

AD HOC PANEL REPORT

EXECUTIVE SUMMARY

This document is the report of an ad hoc panel formed by the Federal Emergency Management Agency to respond to a Congressional mandate for a National Pre-disaster Mitigation study and plan. At the Agency's request, the panel has examined various approaches to the accomplishment of pre-disaster mitigation and provided the Agency with input and recommendations for plan development. The essential recommendations are that any agenda for pre-disaster mitigation activities and projects must:

- concentrate on directly reducing potential losses from natural hazard events through implementation;

- overcome the obstacles to mitigation implementation by developing, among other strategies, effective incentives for decision-makers; locally empowered implementation, a market for natural hazard risk reductions based on awareness and knowledge; Federal and State leadership; technically sound choices for action based on data, technology and information; and supportive public/private partnerships; and

- improve the performance of buildings, facilities and systems in natural hazard events through, among other means, effective codes and standards; an end-user discipline in the identification of research and information needs; sound mitigation principles in growth management; and effective educational partnerships to increase the quality of implementation.

The panel also reviewed a draft National Pre-disaster Mitigation Plan, peer-reviewed it, and provided comments to the Agency. The Plan basically followed the panel's input. The panel believes the Agency should continue to develop the Plan, conduct periodic reviews and updates, and broaden external participation in its activities. The panel has two recommendations with respect to the Plan that it believes are essential to its success:

1. The Plan must be adequately funded. Funding for implementation of pre-disaster mitigation should be increased to $500 million.

2. The President and the Congress must provide Federal leadership by endorsing the Plan, following its principles, and working toward coordination of all Federal efforts that contribute to natural disaster loss reduction.

Document Overview

The *Report and Commentary on Pre-Disaster Mitigation* is presented in two volumes. The first volume comprises key documents necessary to understanding the panel's recommendations and the process by which they were derived. The second volume offers supplementary materials that those who want an in-depth understanding of the panel's review process may find helpful.

This overview is followed by a *Description of the Panel's Process* that explains how panel members reached their recommendations. Next, it provides a rationale for *Selection of Panel Members* that contains an explanation of how panel members were chosen and reviews the pertinent qualifications that each member of the panel brought to its deliberations.

The heart of Volume I is the *Report of the ad hoc Panel on a National Pre-disaster Mitigation Plan to the Federal Emergency Management Agency*. The document contains the key recommendations given to FEMA as guidance for its development of a national mitigation plan. It is followed by Review Comments of the ad hoc Panel on the FEMA Draft National Pre-Disaster Mitigation Plan, which contains a summary of the panel's response to the FEMA plan as presented at the third and final meeting of the panel.

Attachments to this volume include *The Congressional Mandate* that initiated and guided the panel's deliberations (excerpted from the 1997 Conference Committee Report 105-972). This is Attachment A. Finally, abbreviated biographies of all panel members give a fuller view of their qualifications for the service they have performed (Attachment B). The biography of the Chairman is presented first. Biographies of other panel members follow, alphabetized by last name.

Volume 2 contains an agenda, list of attendees, and any presenters for each of the panel's three meetings. Materials for the third panel meeting also include a copy of the FEMA plan as it was presented and reviewed at this meeting.

Attachments to Volume 2 include the Presentation Materials used by presenters at the meetings (Attachment A). These are in the form of overheads with talking points. These are followed by a descriptive bibliography of other materials reviewed by panel members (Attachment B). These materials include supplementary readings mailed out to panel members prior to the meeting for their review, handout materials made available by and for panel members at each meeting, and materials included in participant folders for use at the meeting.

A Description of the Panel's Process

In its direction to FEMA on the steps to follow in developing a National Pre-disaster Mitigation Plan, Congress indicated procedures and process that, if taken at their face value, could require years to complete. As an example, there is the stipulation that

FEMA analyze and study all alternative mitigation strategies. The job of defining what is meant by strategy (considering the three specifically cited in the report language), then cataloguing all possible strategies, could in itself take over three months.

In order to reply responsibly to the expressed Congressional need for some objective judgements about the merits of various approaches to achieving risk reduction, FEMA decided to enlist the assistance of a panel of individuals with a broad range of pertinent expertise in the field of natural hazards mitigation. These individuals could make reasoned judgements on the effectiveness of, and need for, a number of representative strategies. In addition, they would be able to provide a peer review of the Plan, providing the Agency the benefit of their diverse perspectives.

Discussions of this proposed methodology with Congressional conferees indicated that this approach would be acceptable. Preliminary work included the identification and confirmation of members, the preparation of a list of representational strategies, and the selection of logistical support mechanisms.

Once the Agency finalized panel membership and planned the first meeting, Panel members were sent "read-ahead" materials to help them prepare. These materials consisted of individual summaries of alternative mitigation approaches (included in Volume II of this report). During the first meeting, the panel heard presentations on the HomeSaver Project, the CPAND approach to technology transfer, the Housing Affordability Through Design Efficiency research proposal of the NAHB Research Center, and FEMA's *Project Impact*.

The Agency asked panel members to consider these different approaches to mitigation within the context of activities that can be described as:

- basic or applied research and problem studies;
- technology transfer mechanisms that bring research results to the practitioner (for example, by incorporating proven mitigation techniques in building codes to ensure their use in vulnerable areas); and
- the implementation of mitigation measures.

The panel engaged in a useful qualitative discussion of each strategy. However, it chose not to make quantitative comparisons among the alternatives on the premise that it was not the panel's role to prepare a spending plan for FEMA (or for any other Federal Agency with budgetary responsibilities in disaster mitigation).

This report will refer to and discuss various approaches for achieving mitigation. The panel discussed each mitigation approach in terms of:

- the effectiveness and efficiency with which it could be expected to achieve a reduction of natural hazards risk;

- the cost effectiveness of the strategy;
- the resources that might be identified to accomplish the strategy; and
- other considerations that are relevant to a comprehensive discussion of the strategy from a national policy maker standpoint, such as the capacity of the strategy to provide measurable results.

The panel's discussions resulted in its recommendations and commentary to the Director of FEMA on a framework for a National Pre-disaster Mitigation Plan. This material is included in this document. A preliminary copy of it was also provided to FEMA for its drafting of the Plan. At its third and final meeting, the panel conducted a "peer review" of the draft Plan and provided comments to FEMA, Panel members also provided written comments on the draft Plan. The panel's review of the Plan was based principally on how well the Plan responded to panel recommendations and what revisions would improve its clarity or presentation. Review comments of the panel are also included in this document.

Selection Of Panel Members

In identifying and selecting individuals to participate on this *ad hoc* panel, FEMA considered three counter-balancing goals. First, there was the goal of obtaining representatives of "FEMA and other Federal agencies, state and local governments, industry, universities, professional societies, the National Academy of Sciences, the Partnership for Natural Hazards Reduction, and CPAND" as mandated in the Conference Committee report (Report 105-972). Second, the Agency decided that, in order to be effective, the panel needed to be small enough to allow all participants to become fully engaged in discussions. Third, the Agency believed that the panel members needed to be as unfettered in discussion as could reasonably be accomplished.

As the listing below will show, a fairly broad representation of societal disciplines was achieved, and several members of the panel do "double duty" in order to overlap points of view. The second goal was accomplished by limiting the number to twelve members. The third goal was achieved by informing members that they were not "representing" organizations (with the exception of the Idaho National Engineering and Environmental Lab [INEEL] and the Centers for Protection Against Natural Disasters [CPAND], which appear to be special cases in the view of the Conference Committee), but rather speaking from the viewpoint each one has as a result of his or her pertinent academic and career experience. This philosophical approach enabled FEMA to avoid the difficult and inherently unfair process of deciding which organizations would not be represented and made it possible to limit the panel to twelve members.

PANEL MEMBERS

The following summarizes the range of perspectives and experience panel members brought to their consideration of the national mitigation strategy.

1) George K. Bernstein, Esq. - Chairman
The Bernstein Law Firm

Mr. Bernstein, an attorney specializing in insurance regulatory law, was the first Federal Insurance Administrator and served as the author and principal decision-maker for the Executive Branch during the drafting and enactment of the Flood Disaster Protection Act of 1973. This Act implemented the successful formula that resulted in the participation of 18,000 communities in the National Flood Insurance Program. Mr. Bernstein has also chaired committees involving the National Earthquake Hazards Reduction Program, including the Expert Review Committee and NEHRP Advisory Committee, which reported to the Congress in 1987 and 1993 respectively.

2) Christopher Arnold, President
Building Systems Development

Mr. Arnold is an architect in private practice who has been involved in research on multi disciplinary aspects of earthquake preparedness and mitigation since 1976. He has directed a number of key studies for the National Science Foundation on the structural impact of earthquakes. Mr. Arnold has also served as a member of the National Earthquake Hazards Reduction Program's Expert Review Committee and its National Advisory Committee. Currently, he is President-elect of the Earthquake Engineering Research Institute (EERI).

3) Arrietta Chakos
Assistant to the City Manager
City of Berkeley, California

For the past ten years, Ms. Chakos has been an active assistant for natural hazard affairs to the City Manager of Berkeley, California. In this capacity she works with state and Federal legislators on a range of mitigation issues. The Berkeley local government faced with the multi-hazard risks of earthquakes, mudslides and urban wildfire - is recognized as a leader in implementing local mitigation implementation measures, incentives and priorities.

4) Lloyd S. Cluff
Manager, Geosciences Dept.
Pacific Gas and Electric

Mr. Cluff is a seasoned researcher who has completed field studies in many active fault zones throughout the world. He has also served as an advisor to the governments of

countries with active fault zones on the evaluation of earthquake and other geologic hazards and on the formation of guidelines and policies to promote seismic safety. He is currently the manager of the Geosciences Department and the Earthquake Risk Management Program for a large public utility company. In addition, he is a member of the National Academy of Sciences' Board of Natural Disasters (NAS/BOND).

5) Rodman D. Grimm
Thicksten, Grimm, Burgum, Inc.

Mr. Grimm is the President of the Centers for Protection Against Natural Disasters (CPAND). In this capacity, he works closely with businesses, industries, homeowners, insurance carriers, educational institutions, and government agencies to develop and implement policies that will encourage the dissemination and adoption of effective mitigation technologies.

6) James R. Harris
3 R Harris and Company

Mr. Harris, a practicing structural and civil engineer, participates on the Wind Load Committee of the American Society of Civil Engineers and on the Building Seismic Safety Council. His work has included designing or evaluating numerous buildings in high seismic zones and conducting research on effective building techniques to enhance earthquake performance.

7) George Hosek
Michigan Department of Environmental Quality

Mr. Hosek has been involved in land planning and use for the State of Michigan for 32 years. He has worked in the state's Department of Conservation, Natural Resources, and Environmental Quality. For the last 13 years, he has been the State Coordinator for Michigan's National Flood Insurance Program. He has served the Association of State Flood Plain Managers as Vice Chair and as Chair. FEMA has appointed Mr. Hosek to serve on its NFIP Community Rating System task force.

8) Linda Noson
Project Impact volunteer, Seattle, Washington

Ms. Noson has a academic background in seismology and earthquake research. After working briefly with FEMA's Seattle office in the mid-80's, she was employed by a variety of private sector firms Over the years, she has been involved in Seattle's public awareness efforts, earthquake education initiatives, strategy development, and private sector mitigation interest groups. She presently works with the city as a private sector volunteer to define the short and long-term activities in mitigation associated with the city's participation in FEMA's *Project Impact*.

9) Cheryl O'Brien
Executive Director, The Partnership for Natural Disaster Reduction

Midway through the second meeting of the panel, Ms. O'Brien replaced the outgoing Executive Director, N. Clark Williams, as the representative for the Partnership for Natural Disaster Reduction. She is a professional engineer with a technical background in structural analysis and is a senior member of Lockheed Martin Idaho Technologies Company's Applied Mechanics group.

10) David Rodham
Undersecretary for Public Safety
State of Massachusetts

Currently the Undersecretary for the Executive Office of Public Safety of the State of Massachusetts, Mr. Rodham is the former director of Massachusetts Emergency Management Agency and a former President of the National Emergency Management Association (NEMA). As a former state legislator, selectman, town manager, and director of public works, he also possesses practical experience in many roles essential to mitigation strategy development at both the local and state level.

11) L. Thomas Tobin
Tobin and Associates

A practicing engineer with a strong specialty earthquake-protective design, Mr. Tobin is the former Executive Director of California Seismic Safety Commission. During his tenure, the Commission worked to pass legislation to increase earthquake preparedness through a range of mitigation policies and practices. In addition, he brought to the panel substantial education and experience in addressing coastal hazards through his work with the California Coastal Conservation Department. A former member of the NEHRP advisory committee, he is active in the Earthquake Engineering Research Institute (EERI) and the American Society of Civil Engineers.

12) N. Clark Williams, former Executive Director
The Partnership for Natural Disaster Reduction

Mr. Williams represented the Idaho National Engineering and Environmental Laboratory (INEEL) and its Partnership for Natural Disaster Reduction. Midway through the second meeting, his position on the panel was ceded to Cheryl O'Brien, who is the new Executive Director of the Partnership.

13) Brent Woodworth
Director of Services
IBM Crisis Response Team Manager

As the Executive of International Business Machine's (IBM's) crisis response segment, Mr. Woodworth is an excellent representative of the private sector's approach to disaster management.

Report of the *ad hoc* Panel on a National Pre-disaster Mitigation Plan to the Federal Emergency Management Agency

INTRODUCTION

The purpose of this document is to provide to the Federal Emergency Management Agency (FEMA) input and recommendations to be included or reflected in a National Pre-disaster Mitigation Plan. The ad hoc panel has decided to format this input and recommendation as a "framework" for a Plan (including explanatory comment on various aspects of the framework) into which the activities of a plan may be placed. In addition, the panel has included recommended criteria for 1) the prioritization of actions within the framework; 2) the Agency's execution of Plan activities, and 3) the degree to which the Plan should define measurable results. The Panel believes that these criteria are filters through which FEMA and other decision-makers should pass information and data when determining the merit of specific activities or projects proposed for inclusion in the Plan, and deciding whether to give them practical and fiscal support.

The essential strategic approach underlying the framework is implementation. The panel believes that it is important to focus concerted public and private sector support and encourage mitigation implementation activities at the local level. A crucial step in directly reducing natural hazard losses is increasing the desire, commitment and technical capability of local decision-makers. This step engenders an ongoing and continuing practice of policies and standards that mitigate the effects of the natural hazards faced in each locality and region. This in turn results in long-term actions.

In order to effect the comprehensive changes that will result in the reduction of losses from natural disasters in the United States, the panel also believes that there must be substantial and sustained fiscal support from the Congress. Without sufficient resources to carry through on the strategic underpinnings of the framework, the panel believes the Plan will be meaningless.

The panel recommends that FEMA flesh out this framework by placing the next layer of work (activities) into this structure. "Activities" should be viewed as one level above specific projects. The panel is aware that there are varying time frames that will be associated with activities and with projects. Indeed, there are two differing contexts to time frames: first, there is the time frame for completion of a project; second, there is the time frame in which the project shows an effect in the form of reduced disaster losses. In the preparation of activities and identification of projects, some time scales will be obvious, while others will need to be made evident. These aspects should be

considered by the Agency and other Plan participants and reflected as the Plan as it is measured, updated, and improved over time.

The panel also acknowledges that there is a nest of plans within which the Agency and others must operate. While the Agency expects the Plan will be revised in order to operate more effectively within this context of plans, the essential strategic principles and approaches should not change. The Plan framework has been developed to allow flexibility and participation, provided that these qualities do not diminish or retard the achievement of the goals.

PANEL RECOMMENDATIONS AND COMMENTS

Proposed Framework for the National Pre-disaster Mitigation Program

VISION:

The vision is a future in which practices and policies that minimize to acceptable levels the negative impacts of natural hazards on the private and public sectors are adopted throughout the United States.

The use of the term "acceptable levels" is meant to work in concert with "minimize." A range of individuals and organizations determines acceptable levels of losses in any specific instance. The determination of acceptable levels of negative impacts should be consistent with the responsibilities of those with the burden to do so. As an example, the panel discussed the application of performance-based building codes. A private company may decide that it wants to make sure that its employees have a life safety factor in their building (in a natural hazard event) but be willing to risk the economic loss that may be realized if the functioning of the building is lost. A hospital may require a significantly different determination (i.e., that a continued functioning of the building is essential) resulting in a building that is constructed much more strongly with respect to natural hazard effects.

MISSION:

The mission of the National Pre-disaster Mitigation Program is to reduce fatalities and injuries and to minimize the negative social, economic and other effects of natural hazards by developing, promoting and implementing knowledge, safer practices and regulations.

The panel discussed whether it would be better to use the term "losses" instead of "fatalities," "injuries", etc. The panel believes life safety is of special importance. The loss of life, however, does not lend itself to cost-benefit analysis. The loss of life, or the avoidance of the loss of life, should be preeminent without needing such analysis. On

the other hand, economic and social losses from natural hazard events cannot reasonably be completely eliminated.

GOALS AND OBJECTIVES:

Goal 1. Implement natural hazard loss reduction practices and policies.

The panel strongly supports the strategy of providing resources for implementation and recommends that this feature receive emphasis in the Plan. Clearly, there are some localities where mitigation measures are currently being implemented. The intent is to increase or enhance implementation actions in these jurisdictions. In localities that do not presently mitigate natural hazard effects, the intent is to begin implementation.

Achieving the results that are contemplated under this goal will require much more resources than are presently available. As stated in the introduction to this framework, the panel believes that there is a priority need to attain the resources that will support an effective pre-disaster mitigation effort. Such pre-disaster resources will enable practices and policies to be implemented on an accelerated or initial basis in at-risk jurisdictions of the U.S.

Objectives:

a. **Create and leverage incentives for public and private sector loss reduction actions.**

The panel believes that incentives are needed in order to achieve the depth and breadth of mitigation actions that are expected. These actions must occur in the private as well as the public sectors; i.e., both should generate incentives.

b. **Support and encourage the development of disaster-resistant communities.**

The Federal sector will not be able to create on its own communities that are "disaster resistant." It should instead act as a catalyst in leveraging support for, and investment in, short-and long-term mitigation actions in communities.

c. **Motivate the public to take actions to mitigate the impact of natural hazards.**

The panel considered that this objective would be accomplished through marketing and education techniques. It is important to influence the public's attitude toward mitigation. Presently, consumers too often deny the natural hazard threat. This means that there is an insufficient market for mitigation measures in which to operate. Improving the market will require public understanding of the effects natural hazards have on lives, livelihoods, and communities; awareness and appreciation of the specific natural hazards that the public faces in a locality; and public knowledge of the availability and application of techniques to mitigate the potential effects.

d. Implement policies and practices that reduce the vulnerability of Federally owned, financed, and leased facilities and infrastructure.

The panel has two recommendations reflected in this objective. First, Federal sector support to State and local jurisdictions should be combined in a manner that supports mitigation, minimizes duplication and avoids conflicting structures or rules of delivery. Secondly, the Federal sector has a responsibility to demonstrate by example a leadership role in mitigation implementation.

e. Support and encourage policies and practices that reduce the vulnerability of facilities and infrastructure that are owned, financed, and leased by State and local government.

This objective is separated from the objective on Federal sector disaster resistance since the activities, projects, tools and results measurements that would occur under it are substantially different.

f. Develop and provide information to decision-makers and professionals on natural hazards and loss reduction measures.

The panel pointed out that the kinds of activities that would take place under this objective are different from the activities that would occur under objective g. or h. The information provided should be the data needed to help decision-makers reach credible and creditable risk reduction decisions, whether those decisions are building-specific or of a policy nature.

g. Provide technical assistance for implementing loss reduction measures.

This has been a critical component of mitigation implementation. The natural hazards disaster mitigation community has developed some mechanisms to ensure that those who implement mitigation actions, from homeowners to local governments, have the information they need to take technically sound mitigation actions. The panel commented that there are two aspects to technical assistance that help to make it effective. One is that the provision of technical assistance be provided when it is needed. Response to users at the appropriate time will result in an implemented mitigation measure. A second aspect is that technical assistance be provided through the right mechanism. This includes utilizing the individuals or organizations that are most likely to have credibility for the user. For example, building officials should provide technical assistance on code enforcement methods to building officials.

h. Support mitigation training and education for professionals and practitioners.

The panel pointed out that many professions are involved in implementing mitigation and that the Agency needs to focus some energy on its less traditional, non-emergency management audience. This objective includes activities that give technical know-how

to the individuals who, on a daily or regular basis, carry out the application of risk reduction technologies, such as design professionals, land use planners, emergency planners, and facilities managers. There is also merit in pursuing the incorporation of mitigation principles and strategies into the educational curriculum of these disciplines.

i. Discourage social and economic activities that create vulnerability to natural hazards.

The panel wants to emphasize that a mitigation action can be the avoidance of risk as much as the reducing of existing vulnerability or the construction of new buildings to resist natural hazards. It is not the intent of the panel to suggest that the national mitigation program should seek to regulate all construction through national land use requirement.

In addition, the panel recommends that the Plan include the development of disincentives to the activities that create conditions of unacceptable, long-term risk. The panel recommends that the Federal government put into practice policies and procedures that consider the long-term effect of short-term mitigation solutions. As is the case with some of the flood control structures that have been built, there can be unacceptable increases in long-term risks (and the resulting costs of disasters) from neglecting those effects.

j. Advocate public and private risk-reduction decision-making based on the use of hazard identification and risk assessment methods.

There is a rapidly growing and useful set of technologically based tools that can meaningfully improve the technical and scientific basis for mitigation decisions. Application of these tools — which include such items as natural hazards mapping, computerized risk assessment geographic information systems, and rapid reliable data on natural hazards events and natural hazards-induced damage — will support effective risk management.

Goal 2. Improve the performance of facilities and systems in natural disasters.

The panel commented on the distinction it perceived between the first and second goals. As pointed out, the emphasis of this framework is on implementation. It is important to construct buildings that will resist the forces of natural hazards. It is also important to try to improve the quality of mitigation measures and build safer buildings using improved knowledge or technology.

There are presently a number of activities and projects being conducted that will, in the long-term, provide results in the form of reduced potential for disaster losses. There is value in ensuring that this work is part of the Plan so that its focus on results and application is sustained and strengthened.

This goal includes objectives and activities that relate to reducing natural hazards risk in the built environment through the development of knowledge and the transfer of knowledge to the practitioner. While Goal 1 focuses on implementation actions, Goal 2 speaks specifically to the importance of utilizing the implementation experience to improve the quality of mitigation actions.

Objectives:

a. Support the transfer of technology to the end user.

An important aspect of technology transfer is the involvement of the user in the "front-end" of technology development. This facilitates the utility of technology for those who must apply it. In addition, focusing on the end user in technology transfer activities emphasizes the importance of the individual, institution or organization that implements risk reduction measures under the Plan.

b. Improve the quality of planning, design, and construction practice.

This objective is meant to include, principally, activities that 1) provide those who build buildings and infrastructure with the knowledge, tools and technical know-how required in order to realize the natural hazards mitigation aspects of code and standards and 2) provide those involved in enforcement or compliance with appropriate motivation to check plans, inspect work, and approve occupancy. One way to accomplish the second point that was discussed by the panel is to encourage and support design engineer observation of the critical structural details during construction, thus improving the quality of disaster-resistance in buildings and other facilities.

c. Support efforts to improve the development, adoption, and enforcement of building and planning codes and standards that relate to natural hazards.

There is a whole array of activities associated with the code development process, and they are being carried out on an ongoing basis. To the extent that this process is addressing the needs of the Plan's goals in the U.S., there is an element of mutual support that should be formalized through appropriate mechanisms. The adoption process of codes and growth management plans is also crucial to the mitigation of natural hazard risks, particularly in new buildings. However, the panel particularly emphasized the importance of enforcement since it believes this process is critical in ensuring the implementation of building practices that can directly save lives and property. The best building codes are useless if not applied.

d. Support and encourage the validation of mitigation technologies.

Facilities that can test structures or systems by subjecting them to natural hazard forces, either to scale or at full-scale, have much to contribute to the credibility of risk reduction measures. With respect to the wind hazard arena, the panel discussed the

value of utilizing existing testing facilities to their maximum extent. A use analysis of existing facilities (similar to the very valuable use analysis that was performed for small and large-scale earthquake simulation facilities in the U.S.) should be done.

At least equally important is the contribution of observed damages from natural hazard events. The quantification as well as qualification of these losses provide valuable lessons and data to the fields of activities that will apply that data for improvements in codes, standards, and risk reduction rehabilitation techniques.

The panel received material on two "emerging technologies"- techniques for retrofit standards for steel frame, moment-resistant buildings and a laser mapping technique. Some panel members have familiarity with these techniques, but the panel as a group is neither in a position to judge the merit of the technologies, per se, nor in a position to judge the worth of funding demonstration projects on their merit.

e. Support research to improve the understanding of natural hazards phenomena and their effects.

The panel would not want the Plan to become research oriented. Nevertheless, the panel believes that new knowledge about the causes and effects of natural hazards (the development of the tectonic plate theory for the cause of earthquakes, as an example) can have an important and dramatic effect on the implementation of mitigation measures. Currently, both public and private sector are undertaking a number of research-based activities that develop practically useful knowledge and understanding of natural hazards.

Those activities would be reflected in this objective.

f. Advocate research based on user needs, including the development of user driven partnerships.

The panel believes that while the development of fundamental knowledge has its place, the Plan must be centered on mitigation implementation. To do so, it needs to rely on user identification of the improvements needed in implementation measures that would be supported by research, or by research focused on a specific problem encountered in the implementation action.

Program Principles for Decision-Making

The panel believes it is very important that FEMA, the Congress, or any other institution that ultimately has some responsibility or role in the fulfillment of the Plan, should have the panel's recommended criteria in mind when choosing to support one project over another, The principles are intended as tests for use in the decision-making process. They are critical to the success of the Plan because, while the framework for the Plan is intentionally broad and inclusive, decision-making and priority setting are the means to ensuring achievement of essential strategy: implementation.

These are also intended to be common sense principles. For example, not everything done in the Plan will provide measurable outcomes or results in five years. Similarly, judgement about loss reduction effectiveness should consider that mitigation measures for differing natural hazards will have differing sorts of returns on the investments; e.g., for the most part, a flood mitigation measure will reduce the loss of life less than would an earthquake mitigation measure.

1. **The proposed project will reduce losses effectively, including life, and losses that are economic, social, and environmental.**

2. **The proposed project is consistent with the framework and approaches of this plan.**

3. **When considered with other projects, the project contributes to an integrated approach to hazard mitigation.**

4. **The project is assigned (or can be assigned) to an agency with the requisite responsibility and expertise.**

5. **The project will produce meaningful, definable, and measurable outcomes in terms of Principle One.**

FEMA Approaches

In implementing the goals and objectives cited above, the panel believes it should provide to FEMA its views and recommendations on the methodology the Agency should follow in evaluating the projects or activities that it should do and how it should pursue carrying out those activities..

1. **Give priority to activities that directly reduce losses.**

   This is the primary recommendation of the panel to FEMA. Those activities that directly reduce losses are, as an example, the retrofit or rehabilitation of a structure to diminish potential losses, the removal of a structure from a floodplain, the elevation of a structure or its contents to a height above expected flood levels, strengthening or installing tie-downs in homes.

2. **Work interactively with Federal, state, and local government, and with the private sector, to accomplish objectives through various approaches, including the formation of partnerships. Ensure that effective mitigation techniques are communicated to end-users.**

   FEMA should not attempt to achieve risk reduction objectives on its own. First, it will meet more success if it acts in concert with other sectors. Second, the long-term continuity of mitigation, in part, relies on the incorporation of mitigation principles into the daily decision-making of these other partners.

3. **Coordinate the multiple initiatives and agencies with overlapping roles in order to assure consistency and maximize results.**

   There is a lack of coordination in the delivery of Federal sector mitigation programs in support of local implementation. The growing number of Federal and private sector initiatives exacerbate the challenge of coordination. To the extent possible, FEMA should strive to present a harmonious "menu" of programmatic support to those implementing mitigation actions, diminishing or eliminating contrary or conflicting messages and requirements.

4. **Evaluate projects periodically to assess results and take appropriate action to discontinue, sustain, or revise them as needed.**

   FEMA needs to examine those projects it is supporting periodically and, if a project is not producing results, terminate the project. If the results are worth enhancing, the project should receive more resources. If it is working as expected, it should continue.

Measuring Plan Results

It is crucial that the Plan adequately address the element of results measurement. It is important enough to be a separate chapter or section. In order to assess the success of the National Disaster Mitigation Programs in meeting its goals, the panel recommends that FEMA include the following in the section it prepares on measuring results:

1. **Define and quantify the level of existing risks in terms of life, economic, social, and environmental loss.**

   These terms are the results that Congress and the American populace expect from a governmental effort to reduce disaster losses. An initial "snapshot" of the risks faced from disasters nationally is needed to allow meaningful reporting on progress. The capacity to quantify risk should improve over time as more data becomes available. These risk measures should be considered in future revisions of the Plan.

2. **Evaluate results from completed and from ongoing long-term projects.**

   By carrying out this effort, the executors of the Plan will ensure that projects that do not produce, or produce inadequately, can be terminated or effectively altered.

3. **Consider these measurements and evaluations in future revisions of the Plan.**

   The consequences of altered projects may also affect the articulation of activities or objectives. It is not unreasonable to revise these elements to reflect current understanding and expectations.

Review Comments of the Ad Hoc Panel On the FEMA Draft National Pre-disaster Mitigation Plan

PANEL GUIDANCE ON PLAN IMPLEMENTATION

The panel believes that the removal of two major impediments to natural hazards risk reduction— inadequate funding and an absence of national leadership — is essential if FEMA is to successfully carry out the Plan. The panel wishes to recommend that:

- Funding for pre-disaster mitigation be increased up to $500 million per year; and
- The President and the Congress show Federal leadership by endorsing the Plan, following its principles, and working toward coordination of all Federal effort that contributes to natural disaster loss reduction.

PLAN INPUT AND REVIEW

The panel provided input and recommendation to the Agency in the form of a framework for the Plan. FEMA then drafted a Pre-disaster Mitigation Plan. The panel peer-reviewed that draft. The panel also conducted a process to clarify and refine the framework of vision, mission, goals and objectives as well as its comments on them. This was carried out subsequent to the Agency's initial draft Plan. The panel understood that FEMA would consider these comments on the draft in its preparation of the final Plan.

GENERAL COMMENTS

In its review of the draft Plan, the panel found that the Agency had accepted its framework and had adopted it for the Plan. In its discussion of the Plan draft, the panel has the following, overall comments:

- The successful implementation of the framework and the resulting Plan will rely on some very important and fundamental changes for the Agency. Therefore, the Plan needs to recognize that the Agency itself will have to develop its capability and capacity, both in headquarters and field operations, to carry out the principles for Program decision-making and the FEMA approaches for the Plan.
- Some of the "activities" were written as though at the specific "project" level rather than the higher level of "activity". The panel suggests that the Agency try to articulate the higher order of Plan elements first (i.e., activities) before establishing projects to be carried out within the Plan's framework. One way to accomplish this

would be for FEMA to compose a paragraph on the "activities" one does under an "objective" and include a representative sample of projects. The Plan would thus show an illustrative list of potential activities and projects. Whether a specific one is undertaken would be subject to the recommended principles and approaches.

- As implied in the preceding point, the Agency is requested to ultimately ensure that all elements below the objective level—especially projects—go through the decision-making steps contemplated by the criteria of principles and approaches recommended by the panel. The draft Plan contained activities that, while capable of answering positively to those criteria, probably did not undergo that decision-making process.

- The panel encourages the Agency to carry out the broader distribution and review input that was suggested in its presentation to the panel on the Plan. The panel believes that the Plan should receive periodic external and internal review and be revised as required. It will thus improve its strength in the mitigation community, obtain additional input, and increase participation in pre-disaster implementation activities.

- The time frames of actions presented in the draft were approximately one to two years. While this is an appropriate frame of reference, the Agency should strive to reflect the longer-term actions as well. One recommendation of the panel was to show the "longer-term" as 1) five years or more "intermediate", and 2) ten years or more "long-term". Different increments could be used. Also, time frames should distinguish between the duration of a project and the results of a project.

SPECIFIC COMMENTS

1. The Introduction may need to be revised in order to reflect in more detail the key points that were discussed by FEMA and the panel.

2. A preamble to the Plan should state clearly how the principles for decision-making and recommended FEMA approaches will be used under the Plan. Some of this is already in the full document, but it needs to be moved forward in order to emphasize its importance.

3. The Plan should include "States" in the paragraph that explains Goal #1 and in the statement of Objective 1.

4. In goal 1, objective 1, the establishment of "links" between banks or the insurance sector and communities does not seem appropriate. Links already exist.

5. Citing other Agencies involved in or carrying out activities may highlight the interactive context and potential Federal participation in the Plan, Those cited at first should be obvious and representative ones rather than an exhaustive list.

6. Architects and engineers should be included as principle audiences in the technical assistance objective of Goal 1.

7. In the Goal 2 objective on improving the quality of planning, design and construction, building trade associations should be included in the listing of target audiences.

8. In its criteria for communities to be identified as *Project Impact* partners, the Agency should include a community willingness to communicate and share experiences, successes and lessons learned with other communities interested in becoming disaster resistant.

9. In the Goal 2 objective on the development and enforcement of codes and standards, revision is needed to indicate that, while the major model building codes already have criteria for earthquake wind and flood, continued development of loss reduction criteria in the model codes would support achievement of this mitigation goal.

10. In identifying high-risk communities, the panel would recommend that the Agency develop differing actions for communities to undertake depending on their level of risk. For example, the mitigation actions for a high or very high-risk area for earthquake hazards should not be the same in moderate risk areas.

11. Also, in identifying communities as "high-hazard", the Agency should ensure that there are no unintended negative judgements cast onto such communities, especially those that have already undertaken risk reduction actions.

12. The objective in Goal 2 on the validation of technologies should acknowledge that a study of this type has already been performed for the earthquake hazard. As a substitute, it may be more direct to state that a project under this objective could include a study on both the needs and the availability of testing facilities related to wind hazards, and to develop an action plan that addresses those needs.

13. The Plan should be consistent throughout with respect to its mention of "Federal, State and local."

14. In the section on measuring results, it is important that measurement not be commingled with evaluation. Clearly, the panel believes that projects should be evaluated or assessed. But the evaluation effort is likely to be much more subjective than is the measurement effort. Measurement should be as empirical as is possible.

Appropriation

ATTACHMENT A
Excerpts from the
1997 Conference Committee Report 105-972

Acknowledging the importance of pre-disaster mitigation in reducing the loss of human life, the costs and disruption caused by severe property damage, and the ever-growing cost to all taxpayers of government-backed disaster relief efforts, the conferees have provided $30,000,000 for program planning and implementation of pre-disaster mitigation efforts. The conferees acknowledge the potential value of various alternatives that have been suggested to achieve pre-disaster mitigation, including grants to state and local governments to conduct pilot demonstration projects as proposed by the Agency in their fiscal year 1998 budget submission, the HomeSaver Project proposed by The Partnership for Natural Disaster Reduction, the rapid deployment-technologies concept proposed by the Centers for Protection Against Natural Disasters (CPAND), and other research and applied engineering activities, particularly those jointly funded by the public and private sectors.

The conferees agree that up to $5,000,000 of the amount provided for pre-disaster mitigation is available immediately to fund up to seven pilot projects approved by the Director of FEMA. Prior to the expenditure of the remaining funds for any specific pre-disaster mitigation program or project, the conferees direct that the appropriate level of funding be used by the Agency to conduct a formal needs-based analysis and cost/benefit study of all of the various mitigation alternatives. The results of these analyses and studies, along with any relevant information learned from the aforementioned seven pilot projects, shall be incorporated into a comprehensive, long-term National Pre-disaster Mitigation Plan. The plan should be developed, independently peer-reviewed, and submitted to the Committees on Appropriations not later than March 31, 1998. FEMA is directed to involve in this planning effort participants which shall include, but are not limited to, representatives of FEMA and other federal agencies, state and local governments, industry, universities, professional societies, the National Academy of Sciences, The Partnership for Natural Disaster Reduction, and CPAND. The conferees intend that none of the remaining funds provided herein be obligated until the plan has been completed and submitted as outlined above. The conferees note that this approach is intended to be the foundation for providing the best and most cost-effective solution to reduce the tremendous human and financial costs associated with natural disasters.

A

NO NAS Review or Participation! LRE/VLC 6/09

ATTACHMENT B
Biographies of Panel Members

George Bernstein, Chairman

Professional Experience. Since 1974, as an attorney in Washington, D.C. and New York City, Mr. Bernstein has represented investors, insurers, agents, brokers, state insurance departments, the Federal government, and international organizations on such insurance matters as: chartering, licensing, restructuring, merger and acquisition of domestic and offshore insurers and risk retention groups; reinsurance, solvency regulation and receiverships; health insurance, pricing and coverage; antitrust; financial deregulation; product liability; medical malpractice; workers compensation; tort reform; and natural hazard insurance and loss reduction. He has appeared before and continues to testify frequently as an expert witness in state and Federal courts and before Congress and state legislatures.

He served in the U.S. Department of Housing and Urban Development as the first Federal Insurance Administrator from 1969 to 1974. In this capacity, he administered the National Flood Insurance Program, the Federal FAIR Plan and Riot Reinsurance Program, and the Federal Crime Insurance Program. He was also insurance advisor to the White House on such issues as national health and workers compensation insurance, frequently testifying before Congress as an expert witness on behalf of the Administration.

In March 1972, he was also appointed Administrator of the Federal Office of Interstate Land Sales Registration (OILSR), overseeing the Federal program requiring disclosure and registration of unimproved property sold in interstate commerce. He served in both positions through November 1974, when he left HUD to return to the private practice of law.

Prior to Joining HUD in 1969, Mr. Bernstein served with the New York State Insurance Department from 1964, as Deputy Superintendent and General Counsel, and from 1967, as First Deputy Superintendent. Before his appointment to the Insurance Department, he practiced law, primarily in insurance, in New York City.

From 1957 to 1961, as New York State Deputy Assistant Attorney General and Assistant Attorney General in the Litigation and Appeals Bureau, he argued more than 50 civil and criminal appeals in state and Federal courts on behalf of the Insurance Department and other state agencies.

Public Service. Mr. Bernstein was a U.S. Delegate to the NATO Conference on Flood Insurance, 1970; Insurance Advisor to the Cost of Living Council and the Price Commission, 1971-1974, U.S. Government Consultant to the Japanese Government on Flood and Natural Disaster Insurance, 1972; Special Counsel to the New York State

Select Committee on Insurance, 1974-1976. He was consultant to: the Overseas Private Investment Corporation, 1975-1977 and 1983-1984; the President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research, 1979-1981; the Federal Retirement Investment Board, 1987; the Inter-American Development Bank, 1993.

He was a member of the President's Interdepartmental Committees on All Risk and Disaster Insurance, 1970-1971 and Medical Malpractice, 1971-1973; the National Academy of Sciences Committee on Medical Malpractice, 1972-1973; the Advisory Committee to the New York State Legislature on Recodification of the Insurance Law, 1972-1974; the President's Interdepartmental Study on Workers' Compensation, 1973-1974; the National Insurance Development Program Advisory Board, 1976-1977. In 1996, he was a presenter to the People's Bank of China Conference on Insurance Regulation in Changing Markets.

He was Chairman of the Federal Expert Review Committee for the National Earthquake Hazards Reduction Program ("NEHRP") from 1986 to 1990 and the NEHRP Advisory Committee from 1991 to 1993.

Since 1983, he has been court-appointed Agent for the Vermont Insurance Commissioner as Rehabilitator and Liquidator of Ambassador Insurance Company. From 1991 to 1993, he also served as the Vermont Special Deputy Commissioner in the successful rehabilitation of Springfield Life Insurance Company. He is currently serving as Vermont Special Deputy Commissioner in the liquidation of Beverage Retailers Insurance Company Risk Retention Group.

Professional Affiliations and Committees. Mr. Bernstein belongs to the Association of the Bar of the City of New York, where he was Chairman of its Insurance Law Committee 1990-1993 and 1975-1978 and a member of the Committee on Professional Liability Insurance, 1990-1993. He is a member of the District of Columbia Bar Association, the Federal Bar Association, and the American Bar Association, serving on its Tort and Insurance Practice and International Law Sections. He is an associate member of the Society of Financial Examiners and a Principal Charter Member of the Society of Insurance Receivers.

Awards. In 1974, he received HUD's Distinguished Service Award and the Torch of Liberty Award from the Anti-Defamation League of B'nai B'rith.

Education/Professional Qualifications. Mr. Bernstein attended Cornell University, receiving his BA in 1955 and his LLB in 1957, At law school, he won the Moot Court Competition and was Chairman of the Moot Court Board. He was admitted to the New York Bar in 1957, the U.S. Court of Appeals, 2nd Circuit in 1958, the U. S. Supreme Court in 1972, and the District of Columbia Bar in 1973.

Publications/Speaking Engagements. He is the author of numerous articles and studies and has lectured on insurance, natural hazard loss reduction and other areas.

Christopher Arnold

Professional Experience. Mr. Arnold has been primarily concerned with research, analysis and system development for institutional building types. In addition he has had overall responsibility for all building systems design (BSD) research activity since the inception of the firm in 1964.

From 1971-1975, Mr. Arnold was co-principal in charge of design of the Jerry L. Pettis Veteran's Administration Hospital, in Loma Linda, California. This was the first V.A. hospital designed to remain functional for four days after a major earthquake.

Mr. Arnold is currently Co- Principal Investigator for a three year NSF Research Study on Housing Reconstruction in Kobe, Japan, following the January 1995 earthquake.

From 1990 to 1992, Mr. Arnold was Principal Investigator for a NSF study on Damage and Business Interruption to Small Businesses in the 1994 Northridge earthquake. In 1989-1990 Mr. Arnold acted as Principal Investigator for an NSF study on Reconstruction after Earthquakes. He was project director of an Earthquake Engineering Research Institute Joint US/Japan Workshop on Urban Earthquake Hazards Mitigation (1984). In 1989 he was a member of the AIA Urban Design Assistance team that worked in Armenia on the replanning of Spitak. Following the 1989 Loma Prieta Earthquake, he was appointed a member of the Governors Board of Inquiry into the Bay Bridge and I-880 Collapses (The Housner Committee).

From 1982-1994, he was Principal Investigator for an NSF study on Planning Information for Earthquake Hazard Response and Reduction, a comparative study between the cities of Oakland, California and Yokohama, Japan.

Public Service. In 1987 he was a member of the Expert Review Committee of the National Earthquake Hazards Reduction Program (NEHRP) and was a member of the National Advisory Committee for NEHRP, 1991 - 1993 . He was a member of the EERI Board of Directors, 1992-1995, and Vice-President of EERI, 1994-1995. In 1997, he was nominated as President-elect of EERI.

Professional Affiliations and Committees. He is a fellow of the American Institute of Architects; a member of the Royal Institute of British Architects; and a member of the Earthquake Engineering Research Institute. From 1985 to 1990, he was a member of the Committee on Earthquake Engineering of the National Research Council, National Academy of Sciences.

Education/Professional Qualifications. Mr. Arnold received his B.A. in Architecture from London University and his Master of Arts and Architecture from Stanford University. He is a Registered Architect in the state of California.

Publications. Since 1976, Mr. Arnold has been heavily involved in research on multi-disciplinary aspects of the earthquake problem. He is the author (with Robert Reitherman) of Building Configuration and Seismic Design (1982) and many articles and papers on the architecture of seismic design.

Arrietta Chakos

Professional Experience. Since 1994, Arrietta Chakos has served as chief of staff in Berkeley, California's City Manager's Office. Her responsibilities include intergovernmental relations and hazard mitigation. Ms. Chakos works with state and Federal legislators on local government issues, including seismic safety matters.

Ms. Chakos coordinated the district's public efforts on a successful $158 million seismic safety bond measure. She assisted city efforts on two local hazard mitigation bond measures totaling $104 million to be used for the upgrade of all major city facilities, including the City Hall, a new Public Safety Building, eight fire stations, an emergency operations center, and an auxiliary water distribution system. She also secured Federal funding approval for $28 million seismic mitigation project and coordinated efforts to obtain $2 million in Federal funding for regional crime prevention partnership. She also coordinated community relocations out of four seismically unsafe schools.

From 1990-1994, she coordinated hazard mitigation efforts in the local schools and assisted state legislators to direct funding for seismic rehabilitation to urban school facilities. She assisted in the passage of a $158 million local bond measure to fund the upgrade of all local public schools and secured additional state and Federal monies for those projects.

From 1989-1990, Ms. Chakos worked for Macmillan/McGraw Hill as editor and writer on Whole Language Catalog, a resource guide for educators.

From 1984-1989, she was Project Manager for the Live Oak Company, where she developed the business system and the annual budget.

During the period from 1980-1984, she served as acquisitions editor for Bookpeople. In this capacity she selected and edited books for publication and distribution, supervised book production and promotion, and chaired the Board of Directors.

Other professional activities during the period of 1976-1979 include freelance editing for Bay Area Presses; teaching university writing courses and developing writing protocols for staff.

Public Service. Ms. Chakos has served on a number of disaster preparedness and hazard mitigation panels at the local, state and Federal levels. Ms. Chakos has been a member of the Earthquake Engineering Research Institute Mitigation Incentives Working Group since 1997, where she is assisting in development of white paper on hazard mitigation incentives. She is also a member of the Association of Bay Area Government's Hazard Mapping Advisory Group. In this capacity she has provided advice on an update of a study on mapping San Francisco Bay Area seismic hazards. Ms. Chakos is a member of the Oversight Committee for HAZUS Loss Estimation project, FEMA/National Institute of Building Sciences. In this capacity, she advises on a project to develop national standards for natural hazards loss estimates.

From 1992-1996, Ms. Chakos chaired a Town and Gown Preparedness Group founded to develop disaster preparedness partnerships among local emergency response professionals. From 1991-1992, she was a working group member for the Cities of Berkeley and Oakland Blue Ribbon Task Force on Emergency Preparedness. In this capacity she assisted in post-disaster assessment of 1992 Oakland/Berkeley Hills fire response.

From 1991-1992, she served as the Mayor's representative on the Citizen's Review Task Force for Disaster Preparedness, City of Berkeley, CA. From 1990-1994, she was a Local Government Alternate for the Policy Advisory Board of the Bay Area Earthquake Preparedness efforts.

Professional Affiliations and Committees. Other affiliations include board membership on the Berkeley Alliance, the Cal-in-Berkeley Alliance, and the Cal-in-Berkeley program. She is a member of the National Women's Political Caucus, League of Women Voters, and American Association of University Women.

Honors. Citation in Who's Who of American Women.

Publications. Her publications include writings on teaching earthquake hazard mitigation in public schools and a presentation of a case study of multi-disciplinary seismic risk management based on Berkeley, California.

Lloyd S. Cluff

Professional Experience. Mr. Cluff has completed field studies of the relationship of active tectonics, seismic geology, and seismicity of many active fault zones throughout the world including those in New Zealand, Australia, Chile, Argentina, Peru, Bolivia, Ecuador, Columbia, Venezuela, Costa Rica, Nicaragua, Honduras, El Salvador, Guatemala, Mexico, Japan, Taiwan, India, Nepal, Pakistan, Iran, Afghanistan, Turkey, Armenia, Georgia, Russia, Morocco, Algeria, Egypt, Israel, Lebanon, Jordan, Romania, Switzerland, Spain, Portugal, Italy, western United States, British Columbia, and Alaska.

He has also served as an advisor to the governments of many of these countries regarding the evaluation of earthquake and geologic hazards and risks and the formulation of seismic safety guidelines and public policy, especially in the siting, design, and construction of critical facilities.

He has served since 1985 as the Commissioner of the California Seismic Safety Commission, Sacramento. He has also served as Chairman of Commission from 1988-1990 and 1995-1997.

From 1985 to the present, he has been the manager of the Geosciences Department at the Pacific Gas and Electric Company, San Francisco, California. He is also the Manager of the company's Earthquake Risk Management Program.

Prior to this, he was the Vice Principal, Principal, and Director for Woodward-Clyde Consultants of San Francisco, California from 1960-1985. Earlier, he was an Associate Professor of Geology and Geophysics at the University of Nevada, Reno, Nevada (1967-1973).

Public Service. Mr. Cluff's public service includes the following: 1996-present, Member, National Academy of Sciences, Board of Natural Disasters; 1989-1990, Member, U.S. National Committee for the Decade for Natural Disaster Reduction, National Academy of Sciences; 1986-1990 Member, National Earthquake Prediction Council' s Working Groups on California Earthquake Probabilities 1987, Member, Expert Review Committee, National Earthquake Hazards Reduction Program (NEHRP); 1981-1984, Member, Geological Science Board, National Academy of Sciences; 1978-1984, Member, Earthquake Hazards Mitigation Advisory Panel, National Science Foundation and U.S. Geological Survey; 1980-1981, Chairman, Seismic Safety Review Panel, California Public Utilities Commission.

From 1975-1979, he served as a Member of the Newmark-Stever Panel, which developed the National Earthquake Hazards Reduction Program. In addition he served from 1970-1974 as a member of the California Governor's Earthquake Council; 1967-1972, Member, President of Venezuela's Earthquake Safety Commission; 1966-1970, Member, Governor's Earthquake Council, State of Utah; 1969, Member, Santa Barbara Channel Oil Spill Panel, Office of the President and Secretary of the Interior.

Professional Affiliations and Committees. Mr. Cluff has served as President of the Earthquake Engineering, Research Institute (1992-94); President of the Seismological Society of America (1981-83); President of the Association of Engineering Geologists (1967-70), and Vice President of the International Association of Engineering Geology (1968-72).

Awards. Honors he has received include the Alquist Award of the California Earthquake Safety Foundation, 1968; Honorary Member, Earthquake Engineering

Research Institute, 1996; Elected Fellow, California Academy of Sciences, 1992; Degenkolb Award, Structural Engineers Association of Northern California, 1992; and Elected Member, National Academy of Engineering, 1978.

Rodman D. Grimm

Professional Experience. Mr. Grimm has twenty-five years experience in organizing, managing and financing large projects. He possesses a broad understanding of the legislative process, government operations and the regulatory structure, particularly as they relate to private industry. He has extensive experience in properly assembling and managing diverse resources as a cohesive team to address complex issues. He also has functional expertise in multi-disciplinary project management, domestic and international marketing, large project financing; defense, energy, environmental and transportation consulting; regulatory economics; government planning, organization, and implementation; and Federal and state-Executive Branch and Congressional liaison.

Currently, Mr. Grimm serves as President of the Centers for Protection Against Natural Disasters (CPAND). In this capacity he provides policy guidance for CPAND's efforts to attain its primary objective of achieving a large reduction in the damage caused by natural disasters through the rapid and widespread dissemination of cost-effective damage prevention technologies. He works closely with businesses, industries, homeowners, insurance carriers, educational institutions, and government agencies to develop and implement policies that will encourage the adoption of proven cost-effective damage prevention and reduction technologies at the end user level. Coordinate the activities of CPAND's eight regional Centers. As a Director of the California State University, Long Beach Foundation, he participates in various university projects as a technical consultant.

Previous business and professional experience for Mr. Grimm includes serving as President of Thicksten Grimm Burguml; as the Principal for Kearney: Management Consultants; serving on the President's Executive Interchange Program, where he worked in the Department of Energy and the Department of Commerce; Manager of Marketing for Combustion Engineering, Incorporated (Now A.B.B., Inc.); and as Account Supervisor for Marketing Inland Steel Company.

He has also served as a Captain in the United States Army Special Forces.

Public Service. Mr. Grimm is a member of the Board of Directors for the Center for the Commercial Deployment of Transportation Technologies and for the Centers for Protection Against Natural Disasters. He has also been appointed by the President to serve on the Congressionally Mandated Advisory Panel on Financing and Managing Radioactive Waste Facilities. He has been active in Politics and Federal/Congressional Liaison for over twenty-five years.

Education and Honors. Mr. Grimm received his Bachelor of Arts in Economics from Washington State University, where he graduated with honors and was elected to the Phi Kappa Phi Scholastic Honorary Society. He received his Master of Business Administration from the University of California at Berkeley and was elected to Beta Gamma Sigma Scholastic Honorary Society.

James Robert Harris, P.E., Ph.d.

Professional Experience. Dr. Harris is well versed in structural engineering practice and research. He has designed or evaluated hundreds of structures ranging from dwellings to high-rise buildings including industrial facilities, long-span structural floors carrying exceptional loads, buildings in the highest seismic zones, excavation bracing, pile and pier foundations, and renovations of historic buildings. This background spans nearly all types of construction and structural materials and includes responsibility for management of all design disciplines. His experience includes six years of full-time research. His research has focused on the loading and response of structures, particularly earthquake and snow loadings. A second focus is on improving the formulation and use of engineering standards. He has written over 25 reports and journal articles on the results of his research.

Professional Affiliations and Committees. Professional Society Memberships for Dr. Harris include: American Concrete Institute; Fellow; American Consulting Engineers Council; American Society of Civil Engineers; American Society for Testing and Materials; American Welding Society; Colorado Society for Natural Hazards Research; Earthquake Engineering Research Institute; The Masonry Society; National Society of Professional Engineers; Structural Engineers Association of Colorado; President, 1990.

Dr. Harris is also currently involved in the following professional committees and activities. For the American Concrete Institute, he is a member of Committee 318, Standard Building Code, and subcommittees on Seismic Provisions and on Safety, Serviceability. and Analysis; for the American Institute of Steel Construction, he is a member of Specification Committee and Task Committee on Seismic Provisions; for the American Society of Civil Engineers, he serves as: Chairman, Committee for Minimum Design Loads for Buildings and Other Structures (ASCE 7), and is a former Chairman for the Subcommittee on Earthquake Loads for the American Society of Civil Engineers; he is a member of the Committee for Design Loads on Structures During Construction and the former Chairman of the Subcommittee on Loads.

For the Applied Technology Council, he is a Consultant on Guidelines/Commentary for Seismic Rehabilitation of Existing Buildings; for the Building Seismic Safety Council, he is a member of the Provisions Update Committee and Technical subcommittees on Structural Design and Reinforced Concrete; for the National Council of Structural Engineers Associations, he serves as Chairman for the Committee on Registration and Licensing, and for the Structural Engineers Association of Colorado, he serves as Chairman of the Committee on Snow Loads and Committee on Seismic Standards.

Awards. Awards Dr. Harris has received include the United States Federal Emergency Management Agency Outstanding Public Service Award, 1986; United States Department of Commerce Bronze Metal Award for Superior Federal Service, 1981; District of Columbia Council of Engineering and Architectural Societies National Capital for Special Achievement, 1981; and the University of Colorado Department of Civil Engineering Ketchum Award for outstanding graduating senior, 1968.

Education/Professional Qualifications. Dr. Harris holds a Ph.D from the University of Illinois, 1980; an MSCE from the University of Illinois, 1975; and a BSCE from the University of Colorado, 1968. He is registered as a Professional Engineer in Colorado, as a Civil Engineer in California, as a Structural Engineer in Missouri, and as a Professional Engineer in Ohio. He is also registered with the National Council of Engineering Examiners (Record # 8449).

George R. Hosek

Professional Experience. George R. Hosek has been involved in land planning and use issues for the State of Michigan for 32 years. During this time, he has been employed by the Departments of Conservation, Natural Resources, and Environmental Quality.

Over the last 13 years, he has worked to reduce flood losses in Michigan as the National Flood Insurance Program State Coordinator.

Public Service. He was appointed to the NFIP Community Rating System task force and serves as Trustee on the ASFPM Foundation Board of Trustees.

Professional Affiliations and Committees. Mr. Hosek has been involved in flood plain management nationally through his affiliation with the Association of State Flood Plain Managers. He has served in numerous capacities with that organization, including two years as its Vice Chairman and two years as its Chair.

Education. Mr. Hosek holds a Bachelor's Degree in Landscape Architecture from Michigan State University.

Linda Lawrence Noson

Professional Experience. Linda Noson has twenty years of professional experience in the design and implementation of hazard management programs. Her major strengths lie in strategic planning, team building, and information transfer. Primary areas of technical expertise include risk management, hazard vulnerability analysis, mitigation planning, emergency planning, and the development and delivery of hazard reduction training and education programs, workshops, seminars and implementation products.

She is currently President of Linda Noson Associates, which is based in Seattle, Washington. She provides comprehensive hazard management services—including hazard identification, hazard vulnerability, and planning services—to clients including the City of Bellevue, Fred Hutchinson Cancer Research Center and Children's Hospital, and the Regional Medical Center. She also serves as a Federal Emergency Agency Disaster Assistance Employee. She is currently serving as project coordinator for the Seattle project Department of Construction and Land Use home retrofit program under the Seattle *Project Impact*.

Prior to this, Ms. Noson was Director of Mitigation Management Services for Dames and Moore Inc, (1994-1997). In this capacity she designed comprehensive hazard mitigation programs using risk-based methodologies to establish client planning needs, identify critical plan elements, and set implementation priorities. She also developed facility mitigation planning tools, manuals, and management briefings. Ms. Noson was Project Team Coordinator for the FEMA-funded pilot test of HAZUS, a loss estimation methodology, in Portland Oregon. She also served as Project Manager for a multiphase emergency management program for a major Washington utility.

Previously, she was the Director of the Seismic Hazard Division of Ratti Swenson Perbix (1991-1994). Here, she developed a Seismic Hazard Division for a prominent structural engineering firm extending firm capabilities to address multi-building hazard reduction programs linked to the clients operational and safety priorities. She was Implementation Team Leader for a FEMA-funded assessment of the National Earthquake Hazard Reduction Program managed by Martin-Marietta. She produced nonstructural mitigation manual and training seminars for public and private sector clients. She also co-developed and delivered a building inventory workshop for city building officials in Boise, Idaho.

Prior to this, Ms. Noson was a Natural Hazard Specialist in FEMA's Region X office (1988-1991). She managed the FEMA Region X Earthquake Hazard Reduction Program, providing guidance and oversight to Oregon, Washington, Idaho, and Alaska State Emergency Management agencies. She was also a technical consultant to local, regional and national entities on the nature of Pacific Northwest earthquake hazards. She helped develop science education materials with state science center, helped design and deliver earthquake hazard reduction workshops and conferences, and acted as a liaison with scientific community.

As a Seismologist at the University of Washington (1977-1988), Ms. Noson provided information on the nature of Pacific Northwest earthquakes to state legislature, public agencies, individuals, and the media. She served as Co-Chair of the Washington State Seismic Safety Council (1986) and was Director of the School of Earthquake Safety and Education Program (1983-1986). She also led a FEMA-funded pilot project to field test a variety of earthquake hazard preparedness products designed for schools.

Professional Affiliations and Committees. She is on the Board of Directors of the Cascadia Region Earthquake Workgroup (CREW) and serves as the Committee Chair

for the Sixth National Conference Earthquake Engineering, She is also a member of the Contingency Planners and Recovery Managers (CPARM) and the Structural Engineers Association of Washington.

Awards. Her awards include an Excellence Award from the Washington Technical Society of Communication and the John Pyne Environmental Education Award (1988).

Education. Ms. Noson earned her B.S. in Geology from Western Washington University in 1969 and her M.A. in Geology from the University of Washington, Seattle, in 1973.

Publications. She has published several articles on earthquake hazards mitigation policy and education.

Cheryl O'Brien

Professional Experience. Cheryl O'Brien manages the technical programs for the Partnership for Natural Disaster Reduction (PNDR). The partnership, which was supported in its development by the Federal Emergency Management Agency, is an initiative to reduce the loss of life and property from natural hazards by improving building technology. Central to PNDR efforts to establishment of one-of-a-kind test complex at the INEEL which can subject real buildings and structures to severe natural environments. A PNDR priority is to fund, design and build a Windstorm Stimulation Center to test fullscale, two-story structures to hurricane-force winds, flying debris, and rain.

As manager of the PNDR technical programs, Ms. O'Brien is responsible for initiation and completion of feasibility studies and requirements for structural testing needs. Ms. O'Brien collaborates with universities to develop unique natural environment recreation technologies. This technology is then integrated into the facility designs and functions.

As a program manager, she is responsible for program development such as identifying and addressing technology gaps and planning for facility operation use. She has produced workshops and organized working committees of international experts to define and establish the organizational functions of the PNDR to accomplish mitigation technology development and implementation.

Ms. O'Brien became involved with the PNDR project in 1995 when she was named principal investigator for an internal study addressing the technical feasibility of the PNDR facility. She is a Professional Engineer with a technical background in structural analysis and is a senior member of Lockheed Martin Idaho Technologies Company's Applied Mechanics group.

Prior to her career at INEEL, Ms. O'Brien was a structural engineer at Puget Sound Naval Shipyard.

Education. She holds Bachelor's and Master's degrees in Civil Engineering from the University of Idaho in Moscow, Idaho.

A. David Rodham

Professional Experience. Mr. Rodham serves as Undersecretary for the Executive Office of Public Safety of Boston, Massachusetts. He is also Team Leader for Innovations in State and Local Government program for the School of Government, Harvard University. Concurrently, Mr. Rodham is Chairman of the Board of Trustees and a member of the Board of Investment of the Savings Bank in Wakefield.

Mr. Rodham has also served as a Director of Public Works.

Public Service. He was elected to the Massachusetts State Legislature. He has also served as Selectman, Town Manager, and director of Finance and Administration for the Town of Lynnfield.

Professional Affiliations and Committees. He is a former President of the National Emergency Management Association (NEMA) and former Director of the Massachusetts Emergency Management Agency (MEMA). He has also served as the President of the Massachusetts Highway Association.

Education. He holds a Bachelor's Degree in Political Science from the University of Massachusetts and a Master's Degree in Administration from Antioch University.

L. Thomas Tobin

Professional Experience. Mr. Tobin is a consultant on natural hazards and public policy and a registered professional engineer.

Mr. Tobin served ten years as Executive Director of the California Seismic Safety Commission. During his tenure, the Commission was instrumental in passing legislation establishing a new seismic measures including a hazards mapping program, unreinforced masonry buildings retrofit program, higher standards for essential services buildings, requirements for evaluation and strengthening of existing hospitals, requirements for disclosure of seismic weakness in homes and commercial buildings, and bond initiatives to finance strengthening of state office buildings.

The Commission also sponsored passage of the California Earthquake Hazard Reduction Act of 1986 and wrote the state's earthquake risk mitigation program,

known by the name of the publication California at Risk. The Commission also successfully opposed attacks on the Field Act, the Hospital Seismic Safety Act, and several other earthquake risk management programs.

Mr. Tobin has worked on natural hazards and risk management problems for over 33 years. He worked for the Pacific Gas and Electric Company, the San Francisco Bay Conservation and Development Commission, and the California Coastal Commission. His experience in earthquake engineering includes the siting and design of industrial, port and transportation facilities, and the safety of dams. He has pursued hazard mitigation through land use regulation and planning. He has lobbied for legislation having testified to Congressional committees on 6 occasions and state legislative committees on over 100 occasions.

Professional Affiliations and Committees. Mr. Tobin served on the NEHRP advisory committee from 1991 to 1993 and the California State Historical Building Safety Board from 1991 to 1995. He is active in the Earthquake Engineering Research Institute and the American Society of Civil Engineers.

Honors. He is EERI's 1996 Distinguished Lecturer. He also received the San Jose State University College of Engineering's 1996 Award of Distinction.

Education. He is a graduate of the University of California at Berkeley in civil engineering and has a Master's degree in geotechnical engineering from California State University at San Jose.

Brent H. Woodworth

Professional Experience. Mr. Woodworth has over twenty years of executive management and business development experience. Mr. Woodworth is the developer and manager of IBM's Worldwide Business Resumption Services and the IBM Crisis Response Team. He is responsible for the operations of the IBM Crisis Response team in 62 counties.

Mr. Woodward and his Crisis Response Team provide emergency response services to subscribed customers anytime and anywhere a disaster happens. In the past three years, the Crisis Team has responded to multiple disasters including the California earthquakes, the Mid-West floods, hurricane damage in the Virgin Islands, explosion and fire in Johannesburg, fires in Indonesia, and the bombing in Oklahoma City.

Mr. Woodworth is responsible for the development of IBM's public and private sector partnership program. He works closely with the U.S. Federal Emergency Management Agency (FEMA), the Small Business Association (SBA) and a wide variety of state and local government agencies and representatives.

Education and Professional Qualifications. Mr. Woodworth has a Bachelor of Science Degree in Business Management with a minor in Bio-Chemistry and Physics. Mr. Woodworth is certified in disaster recovery planning, emergency medical services, crisis management, and disaster communication services.

Public Speaking. Mr. Woodworth has been a regularly feature speaker at national and international corporate meetings and industry conferences. Mr. Woodworth and his team have been featured in numerous radio, television, and newspaper interviews. Brent has also been a guest lecturer on the subject of disaster preparedness, mitigation, responses, and recovery at colleges and universities including the University of Nebraska, the University of Southern California, Harvard Law School and the University of Canterbury in New Zealand.