

Advisory Committee on **Earthquake** Hazards Reduction
National **Earthquake** Hazards Reduction Program

May 4, 2009

The Honorable Patrick D. Gallagher
Deputy Director
National Institute of Standards and Technology
Building 101, Room A1134
100 Bureau Drive
Gaithersburg, MD 20899-1000

Reference: Annual Report of the Effectiveness of the NEHRP
Advisory Committee on Earthquake Hazard Reduction

Dear Dr. Gallagher:

We are pleased to once again report to you and the Interagency Coordinating Committee on the effectiveness of the National Earthquake Hazards Reduction Program (NEHRP), as stipulated in our Charter and Public Law 108-360. By statute, we are charged to report to you and assess the Program's trends and developments in science and engineering, the effectiveness in performing its statutory activities, the need for revision, and the management, coordination, implementation and activities, and we offer recommendations for ways to improve the Program.

Our 2008 report provided our first complete assessment of NEHRP, and made a host of recommendations. We recognize that it will take some time to implement those recommendations and believe that sufficient progress is being made. We are pleased that the NEHRP Strategic Plan has been completed and is undergoing implementation. The Plan is very well conceived and offers a positive vision for the future of the Program. We look forward to receiving the management plan. We are also pleased that you have retained the National Research Council to develop a twenty-year roadmap for the research and implementation activities needed to support the goals and objectives outlined in the Plan. This independent assessment, with cost estimates included, will greatly improve our collective ability to plan for the future.

In reviewing our 2008 report, we remain comfortable with our assessment of the new trends and developments in earthquake science and engineering, and will not repeat that information in this report. We are working this year to develop more information and specific additional recommendations related to three of the areas discussed. These areas include social science research and implementation, lifelines research and implementation, and the need for long-term funding for multidisciplinary research. We intend to submit a comprehensive report that includes these developing recommendations in 2010.



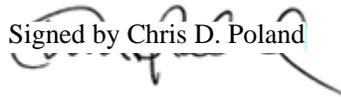
We continue to be quite satisfied with the growing effectiveness of the Program and the revisions that are being instituted. We are pleased that funding for the Program is growing and becoming more stable, and that staff has been added to the NEHRP Office.

We believe that the most significant effort this year to improve the Program needs to focus on its reauthorization by the 111th Congress. We have written to you separately about the areas in the Program that we believe should be modified in the reauthorizing legislation. They include adjustments in some agency responsibilities, enhanced attention to the lifelines that serve the Nation, incorporation of an interagency working group, expanding the support role for the NEES Program to the President's Office of Science and Technology Policy (OSTP), directed support for multidisciplinary research needed to advance earthquake science and engineering, and support for multi-hazard demonstration projects. We trust that our suggestions will be instituted both within the legislation and also with the management of the Program. A copy of our letter is enclosed.

We look forward to our continued association with the NEHRP. We appreciate your willingness to dialog with us and support our activities by creating an open and collaborative environment. Please contact us if you have any questions or wish to further discuss our suggestions.

Sincerely,

Signed by Chris D. Poland

A handwritten signature in black ink, appearing to read "Chris D. Poland", with a long, sweeping underline that extends to the right.

Chris D. Poland, Chair
Advisory Committee on Earthquake Hazards Reduction
National Earthquake Hazards Reduction Program

Enclosure

Advisory Committee on **Earthquake** Hazards Reduction
National **Earthquake** Hazards Reduction Program

May 4, 2009

The Honorable Patrick D. Gallagher
Deputy Director
National Institute of Standards and Technology
Building 101, Room A1134
100 Bureau Drive
Gaithersburg, MD 20899-1000

Reference: Reauthorization of the National Earthquake Hazards Reduction Program

Dear Dr. Gallagher:

The National Earthquake Hazards Reduction Program (NEHRP), originally authorized by the Congress in 1977, was most recently reauthorized and expanded in 2004. NEHRP has been a productive Program for over 30 years, and has provided a remarkable series of accomplishments that have allowed the Nation to be better prepared for major earthquakes. NEHRP is scheduled to be reauthorized by the 111th Congress, and we understand that the first hearing will be held in June.

As your Advisory Committee on Earthquake Hazards Reduction (ACEHR), we meet regularly to advise you and the Program's Interagency Coordinating Committee (ICC) on the effectiveness of the Program, new trends and developments in the science and engineering of earthquake hazards reduction, and refinements in the Program that are needed. In that spirit, we have several recommendations for aspects of the Program that must be retained and others that should be refined during the reauthorization process.

We understand that the reauthorization process is a function of the Legislative Branch and our responsibility to you is within the Executive Branch. We also understand that the ICC may have the opportunity to make specific recommendations to the Congress regarding the language in the reauthorizing bill. In that spirit, we strongly suggest that the structure and framework of the Program be maintained, and that the authorization levels for the NEHRP agencies, as well as the Advanced National Seismic System (ANSS) and the Network for Earthquake Engineering Simulation (NEES) be continued at least at current levels, and preferably increased to permit appropriations that will support full implementation of the Program's Strategic Plan. In addition, we suggest that the ICC work toward addressing and implementing the following recommendations, along with the others that are being sought. We appreciate that many of these changes can be made within the legislation now in place, and certainly leave it to your judgment to decide how best to accomplish each task. These recommendations are consistent with our most recent annual report to you, dated May 2008:



1. Change the agency responsible for leading post-earthquake investigations to NIST.

Consistent with the change in the leadership of NEHRP, ACEHR recommends that the leadership for post-earthquake investigation be transferred from the USGS to NIST. Through its work as the lead NEHRP agency, NIST is developing unique expertise in coordinating the NEHRP agencies' activities and integrating the scientific and engineering knowledge needed for an effective Program in earthquake risk reduction. This expertise should be used to coordinate post-earthquake investigations. NIST's role should include the organization and coordination of reconnaissance teams to document the principal effects of major earthquakes and the sponsorship of publications in discipline-oriented interactive media that archive collected data and summarize lessons learned.

This change is not intended to criticize USGS performance or reduce the post-earthquake activities of other agencies. Rather, it is to bring a high level of coordination to the various specialized activities and unify them together in a common and consistent series of reports. This change in lead agency responsibility must be accompanied by the appropriations required for NIST to lead and to exercise this critical component of NEHRP.

There is a need to improve the gathering and integration of discipline-specific findings—from earth science, seismology, engineering geology, geotechnical engineering, structural engineering covering nonstructural performance, lifelines, social science, behavioral science, economics, and emergency management—into lessons learned. As the lead agency for NEHRP, NIST is already responsible for coordinating the program-related activities of the member agencies; thus, it is appropriate for NIST to also coordinate post-earthquake investigations. Moreover, NIST has experience in post-event investigations through roles such as the national disaster investigator following the September 11, 2001 terrorist attacks. Through its strategic planning and program coordination, NIST can develop the expertise required to deploy multidisciplinary reconnaissance teams to collect, synthesize, and archive earthquake data in a manner consistent with the Post-Earthquake Information Management System that is presented in the NEHRP Strategic Plan.

2. Enhance collaboration and advancements in lifeline engineering.

Lifeline systems (power, water, wastewater, communication, transportation, etc) are designed and constructed by their owners based on the local needs and financial constraints with little consideration given to the need for national disaster resilience. There has not been sufficient attention given to the interdependencies among the systems or the national impact that a single outage can have. Several local lifeline outages have each cost the national economy billions of dollars. Adding disaster resilience will not happen automatically; a new kind of national oversight is needed.

All NEHRP agencies need to expand their activities related to lifeline systems, and central oversight is needed to ensure that the resulting programs and products advance the Nation's disaster resilience. Improving the reliability of lifeline services for both new and existing systems is needed. The expert resources of the natural hazards professional community should be tapped to identify performance goals, best practices and standards, define appropriate peer review procedures, and develop specific mitigation practices that can be applied across the Nation. Regulatory oversight is needed to decrease lifeline infrastructure vulnerability to earthquake hazards. The current expectation that each state will take care of this need within their current standards is unrealistic.

3. **Promote synergistic activities.**

NEHRP includes four agencies with statutory responsibilities: NIST, FEMA, NSF, and USGS. It is overseen by the ICC with the support of a Program Coordination Working Group (PCWG) comprising representatives of the four agencies. There are several other federal agencies with activities and interests that contribute to the overall activities of NEHRP.

The NEHRP vision is for a Nation that is earthquake-resilient in public safety, economic strength, and national security. The related mission is to develop, disseminate, and promote knowledge, tools, and practices through coordinated, multidisciplinary, interagency partnerships. While NEHRP's four lead agencies are making significant progress, there are other departments, agencies, and commissions that sponsor significant earthquake research in support of their individual missions that overlap with NEHRP. These areas of overlap are often lost opportunities for integration and implementation into NEHRP.

For several years after its inception, the Interagency Committee on Seismic Safety in Construction (ICSSC) was successful in coordinating inter-departmental activities in seismic risk reduction. Over the past six years, however, the ICSSC has been dormant. To utilize fully the federal resources invested in earthquake hazards reduction, we suggest that either the ICSSC be reinvigorated and its charge expanded, or an Interagency Working Group (IWG) be formed consisting of other agencies that would work with NEHRP's Program Coordination Working Group to assure maximum possible coordination and collaboration.

In either case, at least the following agencies should be considered for membership with others that can contribute to NEHRP:

- Department of Homeland Security, Office of Science and Technology and the United States Coast Guard
- Department of Transportation, Research and Innovative Technology Administration
- Department of Energy
- National Oceanic and Atmospheric Administration
- Nuclear Regulatory Commission
- Environmental Protection Agency
- Army Corps of Engineers
- Department of Housing and Urban Development

4. **Charge the Office of Science and Technology Policy, Executive Office of the President, with soliciting support from other agencies for the George E. Brown, Jr. Network for Earthquake Engineering Simulation (NEES).**

The George E. Brown, Jr. Network for Earthquake Engineering Simulation represents a significant national resource available to advance the practice of earthquake engineering. At present, it is an underutilized resource because of funding limitations within NSF and the private sector users. There is an opportunity to solicit additional research work for NEES from other federal agencies to utilize effectively and further leverage the Nation's investment in NEES.

ACEHR understands that such interagency solicitation is generally the responsibility of the President's Office of Science and Technology Policy (OSTP) and its National Science and Technology Council (NSTC). Their recently published initiative, *Grand Challenges for Disaster*

Reduction, illustrates the need and opportunity for taking advantage of the NEES Equipment Sites and their associated cyberinfrastructure.

5. Charge NEHRP agencies to support interdisciplinary research activities.

ACEHR has previously recommended that the applied research needed to advance the state-of-the-art of earthquake engineering and improve practices should be highly interdisciplinary, with more involvement from the social sciences. ACEHR believes that the Earthquake Engineering Research Centers (EERCs) are well suited to provide the multidisciplinary, applied research that is needed. Noting that interdisciplinary research and social science research are strengths of NSF, and given the newly launched “missing link” research at NIST, there is a need for coordinated, joint support from at least NSF and NIST for multidisciplinary projects either within the newly graduated EERCs or by teams that have the appropriate inter-disciplinary skills.

The NEHRP Strategic Plan calls for a variety of research activities related to improving practices and improving the Nation’s earthquake resilience. Advancements are needed in all areas of earthquake science and engineering. NSF’s Directorate for Social, Behavioral and Economic Sciences is a prominent funder of interdisciplinary research involving the social and physical sciences with a portion of that funding available for applied research. NIST’s niche in problem-focused research in support of standards, practices, and codes puts them in a leadership position for defining and coordinating the work that needs to be done.

6. Continue the development and sponsorship of multi-hazard demonstration projects.

NEHRP should encourage multi-hazard demonstration projects. In 2008, USGS sponsored a very successful multi-hazard demonstration project in southern California that was initially funded by Congress in Fiscal Year (FY) 2007. The demonstration project effectively integrated the earthquake hazards faced by that region with the other natural hazards in a manner that encouraged preparedness and mitigation activities with multiple benefits. USGS should be tasked to expand the development of multi-hazard assessments in other high-risk areas.

We appreciate the ICC’s support of NEHRP and trust that these suggestions will be judged to be reasonable and represent constructive changes to the Program aimed at covering various unaddressed problems and gaps. We believe they are consistent with the overarching goals of NEHRP, support the vision outlined in the new Strategic Plan, and will further stimulate more effective and efficient use of the available funds.

Please contact us if you have any questions or wish to further discuss our suggestions.

Sincerely,

Signed by Chris D. Poland



Chris D. Poland, Chair
Advisory Committee on Earthquake Hazards Reduction
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