

NEHRP Agency Responses to May 2008 ACEHR Report

January 2009

FEMA

ACEHR¹ Recommendation 1: Revitalize state earthquake programs and support pilot studies to characterize and mitigate unacceptable risk in communities.

NEHRP² Response: The President's FY 2009 budget request included an increase of \$3,500,000 to FEMA's base budget for the Risk Reduction Division, to support State assistance and related mitigation activities. The FY 2009 DHS appropriation includes funding for this increase, so FEMA will restart its efforts in this area during 2009.

ACEHR Recommendation 2: Fund FEMA at the authorized level and assure funding is dedicated to earthquake risk reduction.

NEHRP Response: As mentioned in response to Recommendation 1, a funding increase of \$3,500,000 is included in the FY 2009 DHS appropriation. Funding increases beyond this level will be a matter of consideration for the incoming Administration in its FY 2010 budget request and a subsequent matter of consideration in FY 2010 Congressional appropriations.

ACEHR Recommendation 3: Continue to develop and maintain guideline documents that will improve the effectiveness and reduce the cost of seismic protection for lifelines, existing buildings, new buildings, and applied socio-economic policies for cost-effective mitigation. Promote their adoption and implementation to stakeholders.

NEHRP Response: FEMA much appreciates the ACEHR endorsement of FEMA's efforts. Within the limits of current resources, FEMA will continue to develop and maintain guidance based on current best knowledge and lessons learned from members of the earthquake professional community. Based on the resources available, FEMA will promote knowledge transfer, guidance, outreach, training, and education related to new and existing buildings, lifelines and critical infrastructure; and application of socio-economic concepts.

NIST

ACEHR Recommendation 1: NIST must secure the funding to effectively carry out its role as the lead agency for NEHRP and its role in applied research and assistance in implementation of cost-effective mitigation through codes and standards.

¹ The "ACEHR Recommendations" in this memorandum are the specific recommendations found in the May 2008 ACEHR report to the NIST Director, *Effectiveness of the National Earthquake Hazards Reduction Program, A Report from the Advisory Committee on Earthquake Hazards Reduction*.

² The "NEHRP Responses" in this memorandum are the coordinated responses of the NEHRP agencies to the ACEHR report. The responses were developed by the NEHRP Program Coordination Working Group (PCWG) and reviewed and approved by the NEHRP Interagency Coordinating Committee (ICC).

NEHRP Response: NIST appreciates the committee’s support in making this recommendation. NIST is currently operating under the terms of a continuing budget resolution until March 2009 that funds NIST at FY 2008 levels; the FY 2008 funding levels are essentially the same as those of FY 2007. The President’s FY 2009 budget request included \$4,750,000 of new research funds for earthquake research at NIST. Of the total, \$3,250,000 was included in a line item specifically designated for NEHRP, while \$1,500,000 was combined in a multi-hazard line item for Disaster-Resilient Structures and Communities. NIST awaits Congressional appropriation action on the President’s budget request.

ACEHR Recommendation 2: NIST must plan for the development of multidisciplinary expertise within its own staff and foster relationships with other public agencies and private-sector entities to accomplish the coordinated research to effectively fulfill its obligations.

NEHRP Response: In 2007, NIST awarded a 5-year indefinite delivery/indefinite quantity (IDIQ) research contract to the NEHRP Consultants Joint Venture (ATC + CUREE). This contract provides access to multidisciplinary expertise within the earthquake professional community. Current appropriations have permitted NIST to hire two new research structural engineers with earthquake-related backgrounds. One researcher began work at NIST in August 2008 while the other began work in January 2009. NIST agrees with the ACEHR recommendation, but future staff growth in both the structural area and others will depend on future appropriations.

In addition, as one of the NEHRP partner agencies, NIST intends to consider strongly the use of the NSF-supported George E. Brown, Jr. Network for Earthquake Engineering Simulation (NEES) facilities for any experimental research it undertakes in support of NEHRP. As with the planned staff growth, NIST-funded NEES research will depend on future appropriations.

NSF

ACEHR Recommendation 1: NSF should enhance its support for multidisciplinary research related to NEHRP, which can be used as a model for reducing risks associated with other natural and human-induced hazards. In particular, there is an opportunity for the Engineering and Geosciences Directorates to partner with the Social, Behavioral, and Economic Sciences Directorate to understand the social and economic factors that promote mitigation measures.

NEHRP Response: NSF appreciates the ACEHR support for multidisciplinary research, which has been a strategic cornerstone of NSF research programs such as the now-“graduated” EERC’s and the current NEESR. NSF continues to support multidisciplinary research through a variety of funding opportunities:

- Cross-cutting and NSF-wide funding opportunities for multidisciplinary and interdisciplinary research are offered through a number of programs, e.g., Cyber-enabled Discovery and Innovation, Dynamics of Coupled Natural and Human Systems, Integrative Graduate Education and Research Traineeships, Research Experiences for Undergraduates, Engineering Research Centers, and Science and Technology Centers: Integrative Partnerships.

- NSF recently completed a five-year, NSF-wide Human and Social Dynamics (HSD) program solicitation that supported multidisciplinary research in social science, physical science, natural science, and engineering. Awards were made from this program during FY 2004 through FY 2008 that supported research on hazards and disasters.
- The Office of Emerging Frontiers in Research and Innovation within the Directorate for Engineering issued an FY 2007 solicitation for Resilient and Sustainable Infrastructures (RESIN) that addressed infrastructure research related to natural disasters and sustainability and required multidisciplinary research approaches.
- The Division of Engineering Education and Centers within the Directorate for Engineering supported the three EERC's from 1997 through 2007. A cornerstone of the EERC research was the use of multidisciplinary research approaches.
- The Division of Civil, Mechanical and Manufacturing Innovation within the Directorate for Engineering offers programs that encourage multidisciplinary research approaches, including the Civil Infrastructure Systems program, the Infrastructure Management and Extreme Events program, and the NEES Research program.

NSF welcomes the ACEHR interest in multidisciplinary research and encourages further dialog on how NSF can make ongoing programs that emphasize multidisciplinary or interdisciplinary research approaches more visible and effective.

ACEHR Recommendation 2: NSF should enhance its support for curiosity-driven basic research, which has been the foundation of many important technical discoveries. Basic research sponsored by NSF educates the next generation of engineers and scientists engaged in earthquake risk reduction. Such support is thus a means of expanding the workforce in earthquake engineering and science.

NEHRP Response: NSF agrees with the need for supporting curiosity-driven basic research. Supporting curiosity-driven basic research is a core NSF strategy, as discussed in the *National Science Foundation Investing in America's Future: Strategic Plan FY 2006-2011*. The Directorates for Engineering; Geosciences; and Social, Behavioral, and Economic Sciences all support curiosity-driven, basic research in their divisional core research programs.

In response to this recommendation from the ACEHR, the Directorate for Engineering is phasing out in FY 2009 the broader collaborative proposal categories in the NEES Research (NEESR) program solicitation to enable additional support for more curiosity-driven, basic research proposals.

ACEHR Recommendation 3: NSF should solicit support from other federal agencies to leverage the NSF investments in the George E. Brown, Jr. Network for Earthquake Engineering Simulation (NEES) to address critical research needs for the civil infrastructure. To date, research support for NEES has not matched the levels needed by the earthquake community to reduce earthquake risks significantly.

NEHRP Response: NSF agrees with the ACEHR that the NEES facilities collectively represent an earthquake research community research asset. The facilities are made available for use by investigators for research supported by federal, state, and local agencies, industry consortia, and the private sector, in addition to use for NSF-supported research. In the period 2004-2008, USGS, Caltrans, the Commonwealth of Pennsylvania, industry consortia, and others have supported research at NEES facilities. As stated by NIST in its response to ACEHR NIST recommendation 2, NIST intends to consider strongly the use of NEES facilities for any experimental work it undertakes in support of NEHRP. The new NEHRP Strategic Plan lays out numerous research priorities that, if resources are available, will require the use of NEES facilities. Maximizing use of NEES facilities is also a stated strategic principle in the new NEHRP Strategic Plan.

USGS

ACEHR Recommendation 1: Fully fund ANSS at the level authorized in the current NEHRP legislation. The USGS must make a commitment to work through the Department of the Interior (DOI) and OMB to ensure that this objective is met.

NEHRP Response: USGS has identified ANSS support as a priority in its science strategy. In FY 2008, congressionally added funds for the USGS multihazards initiative were used to strengthen ANSS in Southern California and the Pacific Northwest. The new NEHRP Strategic Plan identifies ANSS support as a strategic priority, based on the availability of resources to support system fielding and maintenance.

ACEHR Recommendation 2: Proceed with multi-hazard demonstration projects, such as the project being carried out in Southern California that was initially funded by Congress in Fiscal Year (FY) 2007. The demonstration projects should expand the multihazard scope to include other high-risk areas as part of this effort.

NEHRP Response: Within its funding constraints, USGS agrees with the ACEHR assessment. USGS has used FY 2008 congressional appropriations increases to strengthen the multihazard demonstration project in Southern California and initiate multihazard projects in the Pacific Northwest and Central U.S. Funding to continue this activity was not included in the President's FY 2009 budget request. Should appropriations for this activity continue, USGS will seek to enhance the projects.

ACEHR Recommendation 3: Enhance the interaction of the USGS with its NEHRP partners in earthquake engineering (NIST and NSF), earth science (NSF), and earthquake preparedness (FEMA). The noteworthy level of coordination in some geographic areas, such as California, and in some project areas, such as the National Seismic Hazard Mapping project, should be extended to other geographic and project areas.

NEHRP Response: USGS heartily agrees with the spirit of this recommendation and is continuing to strive for stronger connections with our partner agencies as appropriate. Examples of current cooperation include the Global Seismographic Network, participation as a partner in NSF's Earthscope, providing technical support for FEMA's New Madrid catastrophic planning exercise with the Central U.S. Earthquake Consortium, the Great

Southern California Shakeout public preparedness exercise in partnership with FEMA and the jointly NSF-USGS supported Southern California Earthquake Center, joint support with FEMA for providing a new *Putting Down Roots* publication for the Wasatch Front region, and continuing support for FEMA by providing seismic design maps for development of the NEHRP Provisions that will become part of the national model building codes.

Management, Coordination, and Implementation

ACEHR Recommendation: Consistent with the change in the leadership of NEHRP, ACEHR recommends that USGS delegate post-earthquake investigation leadership to NIST, including the organization and deployment of reconnaissance teams and sponsoring the publication of discipline-oriented interactive media that archive collected data.

NEHRP Response: The NEHRP agencies do not disagree with the ACEHR recommendation. However, a number of practical considerations make accomplishing this most difficult in the short term. First, the USGS leadership role in post-earthquake investigations is statutory. Without a change in public law, USGS cannot unilaterally delegate or otherwise transfer this responsibility to another agency. Second, NIST is neither funded nor staffed for this leadership role; without the funding and subsequent staffing, NIST cannot shoulder this burden. USGS is currently staffed to be better able to perform this task than is NIST. In addition to its existing capacity, USGS has post-earthquake responsibilities required by the Stafford Act that accommodate its immediate attention to field investigations. Moreover, it is important to note that current appropriations across NEHRP are inadequate to support large field investigation efforts, although USGS makes every effort to perform post-earthquake field investigations in the seismological and geotechnical areas, while NSF supports its GEER and LFE efforts in earthquake engineering. Clearinghouses are supported by all the NEHRP agencies for a wide variety of data types. The new NEHRP Strategic Plan proposes a revamp of the entire post-earthquake information management activity that, with adequate resources, may accommodate the recommended change.