National Earthquake Hazards Reduction Program
Advisory Committee on Earthquake Hazards Reduction
U.S. Department of Commerce Hoover Building
Washington, D.C.
November 8–9, 2011
Summary

Advisory Committee Members:

Chris Poland, Chair	Degenkolb Engineers
Norman Abrahamson	Pacific Gas & Electric Company
James Beavers	University of Tennessee
Richard Eisner	Fritz Institute
John Hooper	Magnusson Klemencic Associates
Michael Lindell	Texas A&M University (via WebEx)
Jack Moehle	UC, Berkeley
Thomas O'Rourke	Cornell University
Susan Tubbesing	Earthquake Engineering Research Institute
Anne vonWeller	vonWeller Associates
Yumei Wang	Oregon Department of Geology & Mineral Industries
Brent Woodworth	Global Crisis Services, Inc.
Ralph Archuleta	UC, Santa Barbara (USGS SESAC Chair) *ex officio*

Speakers and Presenters:

Patrick Gallagher	Under Secretary of Commerce and NIST, Director
Shyam Sunder	NIST, EL Director, *Designated Federal Official*
William Grosshandler	NIST, EL Deputy Director
Jack Hayes	NIST, NEHRP Director
Steve McCabe	NIST, NEHRP Deputy Director
Jay Harris	NIST, NEHRP
Stephen Cauffman	NIST, EL
Ed Laatsch	FEMA
Mike Mahoney	FEMA
Joy Pauschke	NSF
John Filson	USGS
William Leith	USGS
Stuart Nishenko	PG&E
L. Thomas Tobin	EERI President
Mila Kennett	DHS
Richard Reed	National Security Council

NIST:

Tina Faecke	NIST, NEHRP Secretariat
Michelle Harman	NIST, NEHRP Secretariat
Nancy McNabb	NIST, EL
Therese McAllister	NIST, EL
Roger Grant	NIST, EL
Joannie Chin	NIST, EL
Francoise Arsenault	BRI Consulting, support to NIST NEHRP

Guests:

Jay Berger	EERI Executive Director
Wilson Bonner	AGI
Kaitlin Chell	AGU
Jeremy Isenberg	AECOM, Chair of NCST Advisory Committee
Elizabeth Lemersal	USGS
Tammy Dickinson	OSTP
Mohammed Ettouney	Weidlinger Associates

Summary of Discussions

I. Welcome and Opening Remarks

Chris Poland, Chair of the Advisory Committee on Earthquake Hazards Reduction (ACEHR), welcomed everyone to the meeting and reviewed the meeting agenda. Shyam Sunder also welcomed the members on behalf of NIST and NEHRP.

II. National Research Council (NRC) Report on Earthquake Resilience

A. Presentation

NRC report panel members Stu Nishenko and Tom Tobin presented a summary of the NEHRP-funded report, *National Earthquake Resilience: Research, Implementation, and Outreach* (www.nehrp.gov/pdf/ACEHRNov2011_Nishenko.pdf). The NRC report, released in March 2011, provides a roadmap for NEHRP for the next 20 years to achieve earthquake resilience. The report includes 18 task elements in areas identified as important along with projected costs for each task. The annualized costs for the first 5 years of the roadmap are $306.5M/year with a total 20-year estimate of $6.8B.

B. Committee Discussion

A wide-ranging discussion of the NRC report recommendations was held by the ACEHR. Several

members agreed that resilience was a major priority for NEHRP for the future and that the report was helpful in identifying individual tasks necessary to reach that goal. The final task in the NRC report involving a complete demonstration project was generally felt to provide the best impact for the investment. A demonstration project would help determine where roadblocks exist with respect to other elements of the overall resiliency goal. Until that approach is adopted, communities will keep working on the science without understanding resilience.

III. National Building Inventory Resilience Roadmap

Mila Kennett briefed the Committee on cutting-edge risk and resiliency tools being developed by DHS S&T (www.nehrp.gov/pdf/ACEHRNov2011_Kennett.pdf). Kennett discussed the High Performance (HP) resilience model and other resilience projects she is managing The current version is for the New York City Financial District and Midtown Manhattan and the primary use is for evaluating emergency evacuation, rescue, and recovery (EERR) systems after an event. The tools include ways to address the progressive collapse potential and EERR fragilities. Other tools are the Owners Performance Requirements (OPR) tool, and the Integrated Rapid Visual Screening (IRVS) which to computes risk and resilience, providing scores and ratings, and assess risk to buildings, mass transit, and tunnels related to seismic vulnerabilities and other hazards.

IV. Standards for Disaster Resilience for Buildings and Infrastructure

Stephen Cauffman presented on the NIST initiative to develop standards for disaster resilience (www.nehrp.gov/pdf/ACEHRNov2011_Cauffman_Stds.pdf). He provided a background on the losses from recent disasters, including Hurricane Katrina and the Tohoku earthquake. Cauffman discussed the framework for resilience standards, which is moving to a holistic approach that incorporates resistance to and recovery from multi-hazard events. He also reviewed the plan to develop performance goals and performance categories, the proposed process for identifying gaps in standards, codes, and current practice, and metrics and performance level criteria.

V. NIST-Commissioned Resilience Work at the Multidisciplinary Center for Earthquake Engineering Research (MCEER)

Stephen Cauffman briefed the members on the resilience grant awarded by NIST to the University at Buffalo Multidisciplinary Center for Earthquake Engineering Research (MCEER) to establish a framework for developing resilience definitions and metrics at the community scale (www.nehrp.gov/pdf/ACEHRNov2011_Cauffman_MCEER.pdf). Cauffman described the research plan for the grant and its objective: to establish a holistic framework for defining and measuring disaster resilience for a community at various scales Research was broad in scope, incorporating social, environmental, lifestyle, and economic aspects in addition to physical infrastructure. Funding on this grant was ended and NIST resilience research focused specifically on physical infrastructure. MCEER has continued the work and additional

information can be found on its website (http://mceer.buffalo.edu/).

VI. NIST Disaster Resilience Programs

A. Presentation

Shyam Sunder provided an overview of non-NEHRP NIST disaster resilience programs (www.nehrp.gov/pdf/ACEHRNov2011) in the context of the following question: Is it possible to integrate multiple hazards into a "global" resilience model? The Committee was briefed on the NIST reorganization, the mission, vision, and core functions of the NIST Engineering Laboratory and measurement science products. The challenges to measuring resilience of communities and the NIST goal for disaster-resistant buildings, infrastructure, and communities was discussed. Sunder also provided an overview of the NIST Disaster and Failure Studies Program. NIST wants to develop resilience metrics for buildings that address structural systems, non-structural systems, utility infrastructure, and duration of recovery and associated economic losses.

B. Committee Discussion

The Chair asked the members for their thoughts on community resilience and NEHRP. One member stated that the focus must shift from science to resilience, otherwise, resilience will not be accomplished. Another member remarked that resilience is not only about life safety; it is also about how fast a community can bounce back. Determining how people respond also is important. The members also discussed factors related to resilience and recovery. The comment was made that the focus should not be only on making communities capable of carrying on. We must aim higher. The Chair remarked that codes and standards deal with individual buildings, as opposed to systems; in his opinion there is a lack of overarching standards and guidelines for community resilience.

VII. PPD-8, National Preparedness

A. Presentation

Richard Reed presented on PPD-8 (www.nehrp.gov/pdf/ACEHRNov2011_Reed_PPD8.pdf). The President's approach to resilience is an all Nation approach, and all Nation response, with everyone having a role to play. An important consideration is the use of non-government resources and the role they can play in a disaster. PPD-8 was signed by the President in March 2011; the Implementation Plan for PPD-8 is due in May 2012. PPD-8 is based on capabilities, which are the key and must be segmented to the risks and vulnerabilities faced by communities, including terrorism. The planning process also is addressed in PPD-8. Measuring progress as to what is and is not working also is a component of PPD-8.

B. Committee Discussion

The members discussed the PPD-8 initiative with Reed who answered questions and expanded on a number of issues. It was noted that innovative practices are taking place in communities around the country that are simple, inexpensive, and effective. These approaches should be documented. The "all Nation" approach in PPD-8 includes the integration of federal and state and local emergency management with faith-based community organizations. The Chair asked if PPD-8 is about a national framework for resilience or about getting the job done across the Nation. Reed noted that PPD-8 is not prescriptive and that the Federal Government cannot tell the states what to do. The comment was made that leadership can make a difference. There is a very critical role for the Federal Government to play in enhancing resilience. The challenge is how to promote adoption of codes and enhance resilience by the states.

VIII. NEHRP Secretariat Update

Jack Hayes briefed the Committee on the activities of the NEHRP Secretariat (http://www.nehrp.gov/pdf/ACEHRNov2011_Hayes.pdf). He welcomed Ralph Archuleta and Norman Abrahamson to the Committee. NIST will fill the vacancies left by Walter Arabasz, Jonathan Bray, and James Harris. Hayes acknowledged the contributions of Tammy Dickinson from the Office of Science & Technology Policy (OSTP), who has been attending the meetings of the Program Coordination Working Group (PCWG) on behalf of OSTP for more than one year.

Steve McCabe, the new NEHRP Deputy Director, officially joined NIST on April 11 and has assumed responsibility for the NIST research program. Hayes acknowledged the hard work of Tina Faecke and Michelle Harman. He reported that John Filson is temporarily back to full-time status as the Acting Senior Science Advisor for the USGS Earthquake and Geologic Hazards Program, pending the filling of the vacancy left by David Applegate's promotion.

On the NEHRP reauthorization, Hayes reported that the House Science Committee will consider the bill for mark-up on or about November 15. The NEHRP annual report for FY 2010 was released last month. An abbreviated report devoted primarily to budget issues is planned for FY 2011. The last meeting of the NEHRP Interagency Coordinating Council (ICC) was held on April 27, 2011. The next meeting will be held on January 12, 2012. A Post-Earthquake Investigations Planning Workshop and Lifelines Research Needs Workshop have been tentatively scheduled for 2012. Other activities of note include re-engagement with the Interagency Committee on Seismic Safety in Construction (ICSSC) project to develop ICSSC RP-6, *Standards of Seismic Safety for Existing Federally Owned or Leased Buildings,* which is being developed under contract to the Building Seismic Safety Council (BSSC); ongoing work with the U.S.-Japan Cooperative Program in Natural Resources (UNJR) Panel on Wind and Seismic Effects since the August 2011 meeting in Japan; and the work of the NIST Disaster and Failure Studies Program.

A member asked about work on tsunamis. Hayes noted that there are no direct references in the pending NEHRP reauthorization to tsunamis. NIST may have a role, yet to be determined.

IX. USGS Earthquake Program Update

John Filson presented on USGS activities (www.nehrp.gov/pdf/ACEHRNov2011_Filson.pdf). Plans for FY 2012 include a study of the recent Virginia earthquake and publication of study results. USGS believes it is important to understand the cause of the Mineral, Virginia earthquake in the context of geology, structure, and tectonics that might be similar to other locations in the Eastern United States. Filson discussed the recent 5.6 magnitude earthquake in Oklahoma which occurred near a mapped fault. Filson described USGS plans to revise the National Hazard Seismic Maps and work on early warning systems. He also reported on an award from the Moore Foundation to three west coast universities that the USGS will coordinate. The American Recovery and Reinvestment Act (ARRA) funding has been applied to upgrade selected ANSS stations and the upgrades are nearly complete. Lastly, Filson raised the issue of a NEHRP policy to pursue lessons learned and post-earthquake investigations. The Christchurch earthquake would provide valuable lessons learned because of the effects on a modern city. Perhaps NEHRP should write and adopt a comprehensive policy on the study of lessons learned. To clarify the post-earthquake investigations funding issue, Filson noted that the USGS received *ad hoc* funding to study the Loma Prieta and Northridge earthquakes, but has never received authorizations or appropriations specifically for continuing efforts in post-earthquake investigations.

X. FEMA Mitigation Earthquake Programs Update

Ed Laatsch updated members on the FEMA program, including staffing changes at FEMA HQ and Regional offices and the budgets for FY 2011 and FY 2012. Laatsch reported on recent FEMA earthquake projects and publications. In FY 2012, the FEMA focus will continue to be on disaster-resilient building codes, updating publications, support to the states and regional consortia, training, and earthquake awareness projects. Other activities may have to be curtailed because of reduced funding, including those focusing on infrastructure/lifelines and multi-hazard and manmade hazards.

XI. NSF Earthquake Research Programs Update

Joy Pauschke briefed the Committee on NSF earthquake research activities (www.nehrp.gov/pdf/ACEHRNov2011_NSF.pdf). She provided an overview of the NEHRP activities supported by NSF under the Directorate for Geosciences and the Directorate for Engineering. She discussed the NSF RAPIDs grants. Pauschke also updated ACEHR on NEES and that NSF is now planning for earthquake engineering research infrastructure and related research beyond 2014.

XII. Committee Discussion with NIST Director

Dr. Patrick Gallagher greeted the members and thanked them for their work and opened the floor to questions. Questions about the anticipated NEHRP funding levels were asked and how the national debate about the size of Government could affect the Program. It was noted that when the debate turns to assigning funding priorities, ACEHR advice and recommendations will be important inputs to the process. Gallagher thanked the members again for their efforts. He reiterated that the ACEHR input provided in the Committee reports and at the meetings is important to him.

XIII. NIST Disaster and Failure Studies Program Overview

William Grosshandler provided an overview of the NIST Disaster and Failure Studies Program, (www.nehrp.gov/pdf/ACEHRNov2011_Grosshandler.pdf). He discussed the core mission and functions of the Program within the NIST EL. Grosshandler reviewed typical study objectives, the types of disaster and failure studies, and NIST's role in the studies, including international disaster and failure events. He also reviewed the validated decision criteria that provide the basis for launching a NCST study; the NCST study of the Joplin, Missouri tornado; reconvening of the NCST Advisory Committee; and the new disaster failures data repository being developed.

XIV. NIST Earthquake Mitigation Research Update

Steve McCabe briefed the members on NIST earthquake mitigation research (www.nehrp.gov/pdf/ACEHRNov2011_McCabe.pdf). He discussed the project portfolio, including in-house NIST projects and external projects, research accomplishments, and plans for the future.

McCabe highlighted the DFSP data repository, which led to a discussion of its place in the earthquake engineering community. McCabe discussed two large analytical-experimental projects for FY2012: Seismic Response of Reinforced Concrete Walls and Seismic Behavior of Deep Steel Beam-Columns with Plastic Hinges. Each of the projects will start in FY 2012 and each will involve significant laboratory testing by academic labs experienced in large-scale structural testing.

The Chair criticized the research efforts related to Chile, questioning why this work was being pursued. He remarked that the profession should be moving toward a performance-based approach and not looking only at wall failures in buildings that did not collapse. He hopes that the on-going ATC-92/TO 19, Chilean-U.S. Seismic Provisions and Design Comparison will do this. Mike Mahoney on behalf of FEMA commended NIST for its work in Chile. He added that there are also lessons learned from New Zealand and both NIST and FEMA would be challenged to locate funds to work on the Christchurch event.

The Chair reiterated his concern regarding some of the research being performed and stated that ACEHR needs to better understand how research projects are selected. McCabe noted that projects selected have been identified as urgent needs by experts in the community, by participants at workshops and through development of ATC/NCJV reports and other documents. Moreover, this process was presented in detail by Hayes at the Fall 2010 ACEHR meeting in Memphis.

XV. Mineral, Virginia Earthquake Lessons Learned

William Leith, Jay Harris, and Mike Mahoney presented on the Mineral, Virginia earthquake and lessons learned from the earthquake (www.nehrp.gov/pdf/ACEHRNov2011_Leith.pdf and www.nehrp.gov/pdf/ACEHRNov2011_Harris_Mahoney.pdf). Leith remarked that USGS is studying the geology for the earthquake and is pushing for the installation of additional NetQuake sensors. Sensors are already located at USGS HQ and the National Cathedral, and one is planned for the U.S. Capitol. A study to characterize the velocities at seismic recording sites will start next month and run through next spring. Harris discussed the impact of the earthquake on the Louisa County High School and Thomas Jefferson Elementary School. Mahoney concluded the talk by discussing damage to residential homes in Louisa County.

XVI. Public Comment

Tom Tobin, president of EERI, spoke on its behalf. He observed that the long standing EERI Learning from Earthquakes (LFE) program does not fit within the new NSF structure for RAPID grants. He requested ACEHR to address this urgent need. Tobin stated that the current budget situation in Washington affects NEHRP and its constituent agencies to meet their mission. Budget reductions can significantly impact the bridge between research and practice, which can reduce the value of research products produced by NEHRP. Furthermore, building code adoption and enforcement are critical. ACEHR should request the restoration of funding levels cut from NEHRP agencies and push for prioritization of the Program in the Federal budgeting process. NEHRP needs to be reauthorized. The Program needs to be funded at the levels noted in the NRC report National Earthquake Resilience: Research, Implementation, and Outreach. It is important for ACEHR to speak out about authorization levels on behalf of the community.

XVII. Next Committee Report

The Chair asked the members to review the Committee reports from 2010 and 2011 as preparation for the upcoming ACEHR report. A decision is needed on how to address the NRC report and what to say about it. He asked the members to read the entire NRC report. He will schedule a conference call in about 30 days to discuss the report and the Committee's feedback on it.

In discussion on the reporting, the topic of resiliency again was mentioned. It was observed that it would be valuable for ACEHR to hear from those with "on the ground" experience in community resilience. It was observed that the NEHRP agencies have been accomplishing impressive work given limited funds. The report should include an endorsement of these efforts in this budget environment. He asked the authors of the agency sections in previous reports to review those sections and take the lead in updating them. Another area to consider in the next report is redundancy and inefficiency, if it exists. Databases, particularly if they reside at universities, could fall within this category. Other possible areas to cover in the report include synergies between agency programs and funding for lifeline research.

XVIII. Upcoming ACEHR Meetings

The next conference call meeting will be held from 11:00 to 1:00 ET on December 19 or December 20. Tina Faecke will poll the members to determine their availability.

XIX. Adjournment

The Chair thanked the members and adjourned the meeting at 4:00 p.m. on November 9, 2011.