National Earthquake Hazards Reduction Program
Advisory Committee on Earthquake Hazards Reduction
United States Geological Survey
Golden, Colorado
October 23–24, 2007

Meeting Summary

Advisory Committee Members:

Chris D. Poland, Chair	Degenkolb Engineers
Walter J. Arabasz	University of Utah
Jonathan D. Bray	University of California, Berkeley
Lloyd S. Cluff*	Pacific Gas and Electric Company
David E. Cook	The Boeing Company
Richard K. Eisner	Fritz Institute
Ronald O. Hamburger*	Simpson Gumpertz & Heger, Inc.
James R. Harris	J.R. Harris and Company
Howard Kunreuther	University of Pennsylvania
Thomas D. O'Rourke	Cornell University
Paul Somerville	URS Corporation
Kathleen J. Tierney*	University of Colorado, Boulder; Natural Hazards Center
Anne R. vonWeller	Chief Building Official, Murray City, Utah
Yumei Wang	Oregon Department of Geology and Mineral Industries
Sharon L. Wood	University of Texas at Austin
Mark D. Zoback	Stanford University (SESAC ex-officio liaison)

*not in attendance

NEHRP ICC Member-Agency Representatives and NIST Support:

James M. Turner	NIST, Acting Director
Shyam Sunder	NIST, Building and Fire Research Laboratory Director, ACEHR Designated Federal Official
Jack Hayes	NIST, NEHRP Director
Edward Laatsch	FEMA
Joy Pauschke	NSF
David Applegate	USGS
Tina Faecke	NIST, NEHRP Secretariat
John Filson	NEHRP Secretariat
Brian Garrett	NEHRP Secretariat

Guests:

Bill Anderson	National Research Council (former NSF)
Doug Bausch	FEMA Region VIII

Jane Bullock	Bullock & Haddow, LLC (former FEMA)
Pat Leahy	American Geological Institute (former USGS)
Cliff Roblee	NEES Consortium
Zhenming Wang	Kentucky Geological Survey
Dick Wright	Retired (former NIST)

Summary of Discussions

I. Review Meeting Goals, Agenda, and Scorecard

Chris Poland, Chair of the Advisory Committee on Earthquake Hazards Reduction (ACEHR), welcomed attendees to the meeting and asked the members of the committee to introduce themselves. He and the committee congratulated ACEHR member Walter Arabasz on receiving the John Wesley Powell Award from the U.S. Geological Survey (USGS), which is the highest award that the agency gives to non-employees.

Poland reviewed the committee charge, noting that the NEHRP Reauthorization Act of 2004 is available on the NEHRP website (http://www.nehrp.gov/pdf/PL108-360.pdf). He reminded the committee that with the NEHRP lead-agency role recently shifting to the National Institute of Standards and Technology (NIST) under this legislation, the program has entered a new era and needs time to adjust.

Poland distributed agency activity scorecards to the committee, explaining that they would be used to help align what the NEHRP agencies are doing with their statutory responsibilities under the 2004 legislation. He asked the committee to keep the documents handy during the agency presentations to follow. A member asked whether scores should be based solely on the presentations, and Poland explained that scores should reflect not just the presentations, but everything the member knows about an agency's activities. Poland closed by outlining the meeting agenda (http://www.nehrp.gov/pdf/ACEHRAgendaOct2007.pdf).

II. Welcome and Opening Remarks

James M. Turner welcomed the committee members and thanked them for traveling to Golden for this meeting. He noted that since the last meeting in May, his position had changed from deputy director to acting director of NIST due to the departure of William Jeffrey, and that the NEHRP agencies had been busy during this period and had released the NEHRP annual report, bound copies of which were made available at this meeting.

III. Meeting Logistics

NEHRP Director Jack Hayes announced that three ACEHR members (Lloyd Cluff, Ronald Hamburger, Kathleen Tierney) were unable to attend this meeting. He also noted that in addition to Arabasz, another committee member had recently received an award. On October 2, 2007, Richard Eisner received the 2007 Lifetime Achievement Award in Earthquake Risk Reduction from the Western States Seismic Policy Council.

IV. FEMA Statutory Implementation Activities

A. Presentation

Ed Laatsch reviewed the activities undertaken by the Federal Emergency Management Agency (FEMA) to carry out its responsibilities under the NEHRP Reauthorization Act of 2004 (http://www.nehrp.gov/pdf/fema_statutory_activities_ppt.pdf).

B. Questions and Answers

Several ACEHR members asked for more information about FEMA's activities relating to existing buildings and infrastructure. Laatsch responded that FEMA has been active in developing guidance publications relating to existing buildings (e.g., ASCE 31 and 41) as well as new construction. He said that budget constraints had forced the agency to stop providing funding support to the American Lifelines Alliance about 18 months ago, but that a request for additional funding, beginning in fiscal year (FY) 2009, was moving forward from FEMA to the Office of Management and Budget (OMB) that would allow them to restart their infrastructure work.

In response to a question about the status of FEMA's Project Impact outreach initiative, Laatsch explained that, despite the loss of funding support, the program continues, albeit on a more modest level than in the past. FEMA's support was intended largely to plant the seeds of a program that could be continued by others. Laatsch explained that since the 9/11 attacks, agency support for mitigation activities such as NEHRP has declined as greater emphasis has been placed on disaster response operations.

One member asked how FEMA has been adjusting to the increasing involvement of the American Society of Civil Engineers (ASCE) in building code development. Laatsch replied that although FEMA remains very active in code development, it has recognized that the ASCE 7 committee structure is the more appropriate venue for the work formerly carried out by the National Institute of Building Sciences Provisions Update Committee on behalf of FEMA. Another member commented that this shift has enabled the NEHRP Recommended Provisions to adopt a more forward-looking focus, rather than having to concentrate on code-ready language.

V. NIST Statutory Implementation Activities

A. Presentation

Jack Hayes reviewed the activities undertaken by NIST to carry out its responsibilities under the NEHRP Reauthorization Act of 2004 (http://www.nehrp.gov/pdf/nist_statutory_activities_ppt.pdf).

B. Questions and Answers

One member asked about NEHRP staffing at NIST. Hayes explained that the agency has developed a plan to build an earthquake research team at NIST consisting of two senior managers and about six research engineers. Both senior staff will report to Hayes; one will manage NIST's in-house earthquake engineering research program, and the other will run the extramural program. These programs will include research already initiated by NIST under a new indefinite-delivery, indefinite-quantity (IDIQ) contract with a joint venture comprising the

Applied Technology Council (ATC) and the Consortium of Universities for Research in Earthquake Engineering (CUREE).

Shyam Sunder added that NIST plans to devote about 40 percent of its NEHRP research funds to the intramural program and the remaining 60 percent to extramural efforts (including the ATCCUREE contract). FY 2008 research funds are expected to total about $5.5 million. Sunder also remarked that NIST is encountering some difficulty in finding qualified applicants for its in-house NEHRP positions, and asked for the committee's help in identifying suitable candidates.

A member inquired about whether and how NIST is engaging with the National Oceanic and Atmospheric Administration (NOAA). Hayes and Sunder indicated that, although NIST has strong, ongoing relationships with NOAA in connection with hurricane and wildfire hazards, it is working to further develop the new NEHRP research programs and adjust to its role as NEHRP lead agency before reaching out to agencies outside NEHRP. In the future, however, NIST does anticipate such collaboration and has already been in contact with the managers responsible for NOAA's tsunami hazard mitigation program.

VI. NSF Statutory Implementation Activities

A. Presentation

Joy Pauschke reviewed the activities undertaken by the National Science Foundation (NSF), which currently receives about 40 percent of the total NEHRP budget, to carry out its responsibilities under the NEHRP Reauthorization Act of 2004 (http://www.nehrp.gov/pdf/nsf_statutory_activities_ppt.pdf).

B. Questions and Answers

One member asked how NSF is working to integrate social sciences with the physical sciences in the research that it supports. Pauschke responded that NSF offers NSF-wide research programs that offer additional funding opportunities for self-forming, interdisciplinary research teams in the earthquake field as well the opportunities in the ongoing unsolicited NSF research programs. Other questions concerned how NSF disseminates research results (this is done primarily through the grantees) and tracks progress in diversity (this is reported on an agency-wide, rather than program-specific, basis).

A member inquired about the status of the recent NSF reorganization involving the merger of manufacturing and civil engineering divisions into the Civil, Mechanical and Manufacturing Innovation Division. Pauschke indicated that some adjustments have been required to successfully merge these two formerly separate cultures, but that the merger has been implemented and the new division is now looking at ways to involve its constituent communities.

Another member asked whether NSF would be open to participating in an approach whereby joint teams from the NEHRP agencies would visit high-risk states or regions to evaluate their earthquake-related needs. Pauschke responded that such an operational needs assessment role would not conform with NSF's mission of funding fundamental research; however, NSF does

fund research that investigates the seismic hazard and the seismic performance of the built environment throughout the United States, including high-risk regions.

VII. USGS Statutory Implementation Activities

A. Presentation

Dave Applegate reviewed the activities undertaken by USGS to carry out its responsibilities under the NEHRP Reauthorization Act of 2004 (http://www.nehrp.gov/pdf/usgs_statutory_activities_ppt.pdf).

B. Questions and Answers

A member asked how the Department of the Interior determined that the Advanced National Seismic System (ANSS) was the most cost-effective program investment in the entire department. Applegate responded that there were two primary criteria used in making that determination: the risk associated with the investment not paying off, and the value of the investment to the nation. ANSS was rated as having the lowest risk and the highest value. Another member asked how USGS is working to make its investment in ANSS pay off. Applegate explained that the agency is leveraging the system's contributions to multihazard activities and leveraging outside funding for the system. NSF helped fund development of the ANSS backbone network, for example, and USGS then took over operation and maintenance (O&M) of the network.

One member asked whether the ANSS budget is being used to develop new monitoring stations or to fund O&M. Applegate replied that as new stations are added within a fixed level of funding a growing share of the budget is of necessity being devoted to O&M. He stated that the House has approved additional appropriations for ANSS in FY 2008, but the legislation has yet to be enacted; Congress has authorized $173 million for the system. A member remarked on how important it is for ANSS to get the funds needed to complete its planned dense urban instrumentation. Another member concurred, stating that science follows data and that practitioners are more likely to embrace recommendations that are supported by monitoring data.

VIII. Review of NEHRP Annual Report

A. Presentation

John Filson discussed the requirements for, contents of, and lessons learned from NEHRP's 2007 annual report, which was completed in March 2007, and the process under way for the 2008 report (http://www.nehrp.gov/pdf/annual_report_ppt.pdf).

B. Questions and Answers

One member commented on how challenging it is to convey in these reports the full impact of NEHRP, since the program stimulates or triggers so many additional activities at the federal, regional, state, and local levels. It was suggested that future reports attempt to highlight some of these "ripple effects." A member noted that the 2007 report includes information on state activities funded through NEHRP grant funds, and commented that this boosted interest in the document. Another member questioned whether the reports might be too lengthy for congressional staff, and whether it might be useful to distribute short, glossy summaries along

with or in place of the full reports. Sunder indicated that congressional staff have appeared interested in obtaining and reading the 2007 report.

IX. FEMA Interim Performance Measures Report and Current FEMA Performance Effectiveness Measures

A. Presentation

Ed Laatsch described the work carried out in late 2004 and early 2005 on the development of initial performance measures for NEHRP (http://www.nehrp.gov/pdf/fema_interim_report_ppt.pdf). FEMA completed this initial effort as one of its final tasks as the NEHRP lead agency, producing the *Interim Report on NEHRP Performance Measures* in December 2005. After providing an overview of this project, Laatsch described FEMA's current NEHRP-related performance metrics.

B. Questions and Answers

The committee asked how the initial NEHRP performance measures were selected and whether any joint measures were considered in addition to the agency-specific measures discussed by Laatsch. Laatsch indicated that joint measures were not pursued at that time; the NEHRP agencies felt that it was more feasible to start by taking advantage of the metrics and measurement infrastructures that each agency had already put in place. Federal agencies had devoted considerable effort to performance measurement in response to the Government Performance and Results Act of 1993 and to the use, beginning in 2003, of the Program Assessment Rating Tool by OMB.

Several members asked specific questions about FEMA's current performance measures. These included whether the agency is tracking the adoption of codes for lifelines (this is not being tracked), and whether data is being collected on the adoption of seismic provisions in building codes and on code enforcement. Laatsch explained that through a partnership with the Insurance Services Office (ISO), FEMA has begun gathering such data by accessing and customizing the data that ISO tracks under its Building Code Effectiveness Grading Schedule (BCEGS). One member asked why FEMA is not measuring the utilization of its publications. Laatsch responded that metrics relating to publications have so far been limited to production and distribution efficiency because those are the measures for which data are available, but that requesting feedback on the effectiveness of its publications is an ongoing priority for FEMA.

X. Current NSF Performance Effectiveness Measures

A. Presentation

Joy Pauschke presented an overview of the NSF metrics relevant to NEHRP (http://www.nehrp.gov/pdf/nsf_performance_ppt.pdf).

B. Questions and Answers

Several members asked about performance relating to the dissemination of research results. Pauschke explained that because NSF has no funds that it can provide to support dissemination efforts, the agency does not track metrics on research dissemination. Although grantees include information on their own dissemination activities in the project reports that they submit to NSF,

this information may reflect only their initial efforts. In regard to NSF's metric on the operation of NEES research facilities, a member asked whether the measure tracks the time that the facilities are used or the time that they are available for use. Pauschke clarified that it is the time that facilities are operational or available for use that is measured.

XI. Current USGS Performance Effectiveness Measures

A. Presentation

Dave Applegate reported on current USGS metrics relevant to NEHRP (http://www.nehrp.gov/pdf/usgs_performance_ppt.pdf).

B. Questions and Answers

One member asked how the agency evaluates which jurisdictions have the infrastructure needed to effectively use its tools or information. Applegate indicated that FEMA is tracking the adoption of building codes with seismic provisions; current USGS metrics track which jurisdictions are covered by ANSS strong-motion instrumentation, not which areas are or are not ready to use it. Another member asked how USGS determined how many monitoring instruments are needed to support ShakeMap. Applegate and Filson responded that this determination of the necessary density of station coverage was made back in the late 1990s when ANSS was being planned; the method used was documented in the ANSS planning report (USGS Circular 1188). In answer to a question about what specific products are included in the agency's seismic hazard maps, Applegate stated that the types of maps included vary by city depending on local geologic conditions and hazards. A member asked whether Applegate could provide any performance results for the measures he had described. Applegate briefly reviewed some of the latest performance data and stated that USGS can provide complete results should the committee desire them.

XII. Current NIST Performance Effectiveness Measures and Future NEHRP Performance Measures Development

A. Presentation

Jack Hayes provided an overview of current performance measurement activities and planning at NIST, and discussed the future development of metrics for NEHRP (http://www.nehrp.gov/pdf/nist_performance_ppt.pdf).

B. Questions and Answers

The committee asked how lifelines are expected to figure into NIST's new earthquake research program. Hayes stated that a workshop is planned for 2008 to develop a roadmap for research and development related to lifelines. Sunder added that the funding increases so far requested by NIST's Building and Fire Research Laboratory for NEHRP research reflect the priorities identified in the ATC-57 roadmap on the research-to-implementation gap for structures. Separate plans for lifelines will need to be formulated based on findings from the 2008 workshop.

One member inquired about how the agency-specific measures described at this meeting will fit together to assess the performance of the entire NEHRP program. Hayes and Sunder responded that the development of program metrics will be addressed following completion of the new

strategic plan for 2008–2012, when work will begin on the accompanying management plan (approximately 8 to 10 months from now). Metric development will need to reflect the realities of a program that comprises four separate agencies with different cultures, different relationships with OMB, and different levels of involvment in NEHRP. Hayes added that the program will be looking for a practical approach to performance measurement that does not unduly burden the participating agencies.

XIII. Budget Process Discussion

Chris Poland chaired a discussion of the federal budget process and its application to NEHRP. Some of the main issues and insights that were touched upon included the following:

- Getting funds authorized by Congress is important when you want to do something new that you have not been able to do before.
- Each congressional appropriations committee has responsibility for multiple program areas and can shift funds around within those areas.
- There can be intense competition for funds within, as well as between, agencies.
- Since NEHRP funding is unlikely to impress local constituents, congressional earmarks are probably not a productive means of boosting program funding.
- Although it is probably too late to increase the total funds that an agency will receive for FY 2009, it is still possible to redirect funding within the programs and priorities that FY 2009 funds have been requested for. To do so, however, the committee would need to persuade agency management, who are responsible for ranking competing priorities. A recommendation to increase the funding allocated to a priority can be more salable if it is accompanied by suggestions on how other program funds can be freed up.

XIV. Overview of Draft NEHRP Strategic Plan Outline

A. Presentation

Jack Hayes described the proposed outline that has been developed for the 2008–2012 NEHRP strategic plan, and the proposed schedule for plan development (http://www.nehrp.gov/pdf/strategic_plan_ppt.pdf). He supplemented his PowerPoint presentation with the following information on which agencies have been tentatively assigned to lead or assist in the development of strategic-plan text relating to each of the 15 proposed program objectives:

Lead and Supporting Agencies for Draft Strategic Plan Objectives

Objective	Lead Agency	Supporting Agency
1	USGS	NSF
2	NSF	
3	NSF	
4	NIST and NSF	
5	USGS	
6	FEMA	NSF
7	FEMA	NIST
8	FEMA	NIST and NSF
9	NIST	FEMA

Lead and Supporting Agencies for Draft Strategic Plan Objectives

Objective	Lead Agency	Supporting Agency
10	USGS	
11	USGS	FEMA
12	FEMA	NIST
13	FEMA	NIST
14	FEMA	
15	FEMA	NIST, NSF, USGS

B. Questions and Answers

Hayes concurred with a member who suggested that it may be appropriate for the committee to compare its document, "Trends and Developments in NEHRP-Related Science and Engineering" (http://www.nehrp.gov/acehr/pdf/trends_developments.pdf), to the program "thrust areas" proposed for the section of the plan entitled "Program Development." A member asked whether the thrusts are intended to encompass everything that NEHRP needs to do. Hayes said no, that the thrusts are meant to be the most important or urgent gaps that the program should work to fill.

Several members commented on the "forward-looking workshops" proposed for the final section of the plan. Sunder asked for the members' input on topics for these workshops. It was suggested that they should include multihazard perspectives and the increasing involvement of the Department of Homeland Security in natural hazards-related work. Topics of workshops recently held or being planned include existing buildings, performance-based seismic engineering, earthquake scenarios, and post-earthquake information management systems.

XV. ACEHR Discussion

Chris Poland asked members for specific comments and suggestions relating to the strategic plan. Some of the comments provided included the following:

- Accompany the discussion about gap-filling thrusts with contextual information on areas that are not considered gaps.
- In the mission statement, say "encourage implementation of" instead of "implement."
- Incorporate information on the financial aspects of long-term mitigation and on the societal consequences of earthquakes.
- Mention hot-button projects, including ANSS, HAZUS, and NEES.
- In Objective 3, change "risk avoidance" to "decision making relating to low-probability, high-consequence events and community-scale resilience."
- Consider combining or rewording objectives 7 and 8 (e.g., to emphasize system interdependencies).
- Change "rapid impact statements" to "rapid impact assessments" in Objective 10.
- In Objective 11, change "realistic" to "comprehensive."
- Add code adoption and enforcement into Objective 12, and change "systematic" to "technical."
- Add professional organizations into Objective 13.
- Discuss seismic safety commissions and the development of financial plans under Objective 14.

- Add private-sector practices and policies into Objective 14.
- Change the second thrust into an additional objective or work it into Objective 14.
- Rephrase Objective 15 to focus on education and its subsidiary forms; explicitly include risk communication.

XVI. Recent FEMA Program Changes

A. Presentation

Ed Laatsch discussed recent changes in NEHRP-supported activities at FEMA (http://www.nehrp.gov/pdf/fema_program_changes_ppt.pdf). The agency is currently planning a new public outreach campaign in partnership with the Safe America Foundation. More information about this should become available over the next 12 to 18 months. FEMA has also begun to provide some information relating to man-made hazards through its Risk Management Series publications.

Changes in mitigation-related budgeting have significantly reduced the non-salary funding available for carrying out NEHRP program activities, from about $15 million in 2000 to an expected $6 million in 2008. This has compelled FEMA to discontinue its support for the American Lifelines Alliance and the Natural Disasters Roundtable. The agency is also having trouble maintaining past levels of support for HAZUS and the regional earthquake consortia, and no longer has the funds needed to maintain its large inventory of earthquake-related publications. Additional funding has been requested for NEHRP-related activities as part of the FY 2009 Over Target Request (OTR) process, and that request is currently under review.

B. Questions and Answers

One member asked what FEMA expects from the outreach initiative being planned with the Safe America Foundation. Laatsch responded that the campaign should improve the disaster resilience of several communities by increasing public awareness and by engaging a cross-section of community stakeholders in a focused, targeted initiative that can serve as a model for other communities. Another member questioned why, when funding has been declining, FEMA's performance measurement results have generally been improving. Laatsch explained that the metrics are showing how well FEMA is doing with the funding that it has.

XVII. Recent NIST Program Changes

A. Presentation

Jack Hayes provided an overview of recent developments in NEHRP-supported activities at NIST (http://www.nehrp.gov/pdf/nist_program_changes_ppt.pdf).

B. Questions and Answers

A member inquired about the timeframe for the in-house study that has been initiated on the economic impacts of the seismic provisions in model building codes. Hayes stated that the study is expected to be completed in FY 2009. Another member questioned whether geotechnical engineering might fall between the cracks of NIST's new earthquake research program. Hayes responded that geotechnical engineering will be addressed through the IDIQ support contract with the ATC-CUREE joint venture. The committee also asked whether the research program

might look into estimating scenario losses with and without prior mitigation. Hayes noted that the MAE Center is already developing loss estimation fragility functions needed to do this.

XVIII. Recent NSF Program Changes

A. Presentation

Joy Pauschke discussed recent developments in NEHRP-related activities at NSF (http://www.nehrp.gov/pdf/nsf_future_ppt.pdf).

B. Questions and Answers

Pauschke was asked how, given the impending graduations of the three NSF-supported earthquake engineering research centers (EERCs), the agency will maintain social science research opportunities. Pauschke stated that NSF has established many agency-wide programs that solicit and support research proposed by interdisciplinary teams. A member commented that by ending all financial support for the EERCs, NSF will likely lose any ability to influence their future directions. Pauschke noted that NSF has always intended for the centers to end their dependence on NSF funds and become self-sufficient, self-directed entities. Another member asked whether NSF ever commingles research support from the engineering and geosciences directorates. This is done, according to Pauschke, both through co-funding of specific projects and through joint contributions to agency-wide research programs.

XIX. Recent USGS Program Changes

A. Presentation

Dave Applegate provided an overview of recent developments in NEHRP-supported activities at USGS (http://www.nehrp.gov/pdf/usgs_program_changes_ppt.pdf).

B. Questions and Answers

Applegate was asked whether the FY 2005 tsunami supplemental funding was given to NEHRP. He answered that although the funds were provided to both the USGS Earthquake Hazards Program and Global Seismographic Network line items (the two USGS components of NEHRP), they were designated for specific purposes only (e.g., for building new monitoring stations in the Caribbean and initiating on-site 24/7 operations at the National Earthquake Information Center). A member asked whether, as USGS involvement in EarthScope continues, O&M costs can be budgeted and funded separately. Applegate responded that the agency's future role in EarthScope has yet to be determined.

XX. Panel Discussion

At the invitation of ACEHR, four accomplished panelists, each formerly employed by a different one of the four NEHRP agencies, spoke to the committee. Each of these individuals provided observations and insights concerning NEHRP and their agency's past, present, and future roles in the program. Some of the valuable information they conveyed is summarized below.

A. An NSF Perspective, Presented by Bill Anderson

Anderson worked in the earthquake program within NSF's Engineering Directorate for more than 20 years before retiring from the agency several years ago. He traced the history of

earthquake research at NSF before and after NEHRP was established, and identified some of the tensions relating to earthquake research that have persisted through the years. These include devoting resources to curiosity-driven research versus directed or goal-driven research, to hot topics versus less glamorous subjects, to multidisciplinary versus disciplinary research, and to the major segments of earthquake research (geotechnical, structural design, and social science/interdisciplinary).

Looking ahead, NSF-NEHRP issues that will need to be addressed include (1) how to keep multidisciplinary research at the forefront following the EERC graduations; (2) how to maintain the outreach and dissemination that has been performed by the centers; (3) how to keep resources in balance across earthquake research disciplines; (4) how to replenish, and increase diversity within, the earthquake research and practice communities; and (5) how to leverage the abundant resources being allocated to homeland security.

B. A FEMA Perspective, Presented by Jane Bullock

Bullock was NEHRP program director at FEMA when the agency assumed the NEHRP lead-agency role, and remained involved with the program as FEMA chief of staff in the 1990s. Some of the most important lessons she learned were the following:

- An important avenue of growth for the program can be through "supplementals," the extra funding that tends to be shifted to hazard programs (often permanently) following a major related disaster.
- External committees of experts such as ACEHR can play a critical role in preparing for the next supplemental by analyzing and determining the most productive uses for new program funding. Following an earthquake, the committee's recommendations can be taken to OMB to facilitate supplemental funding.
- Assigning responsibility for mitigation to the emergency management community can be problematic, since these professionals are often more focused on disaster response.
- Mitigation must be done at the local level in cooperation with the local business community. Robust local programming is essential for NEHRP.
- NEHRP needs, but has generally not had, a strong and supportive political constituency in Congress or among states, localities, businesses, other federal agencies, or other hazard organizations. Such constituencies can be cultivated by leveraging multihazard approaches and relating earthquake risk reduction to other needs (e.g., reducing the vulnerability of lifelines to earthquakes is critical to national security).

C. A USGS Perspective, Presented by Pat Leahy

Leahy retired in May 2007 after 33 years at USGS, including 12 years as associate director for geology during which he was responsible for overseeing earthquake hazard programming. He told ACEHR that although the traditional growth strategy for hazard programs has been to wait for supplementals to increase the base funding used for budgeting, this approach can no longer be relied upon. The program needs a champion in Congress. The ICC can also play an important role in setting joint priorities and in working to match appropriations to authorizations.

Use of realistic scenarios and multihazard assessments can help bring visibility to and cultivate constituencies for earthquake risk reduction. A common message set in the context of public

safety is important in Congress, and through its new coordinated budget approach NEHRP can leverage strength in numbers at OMB. Another valuable political lesson has been provided by the Pew Commission on Oceans, which submitted authoritative recommendations to Congress during the final days of the Clinton Administration. A member of the commission has remained engaged in monitoring the progress of these recommendations, and periodically issues a scorecard. Failing scores can be influential on Capitol Hill.

D. A NIST Perspective, Presented by Dick Wright

Wright accumulated many years of experience at NIST, which he first joined in 1971. Echoing Bullock, he observed that earthquakes have been an important vehicle of opportunity for NEHRP, and advised ACEHR to be ready to show leadership after the next large quake. He spoke of the need to seriously explore multihazard perspectives, since the replication of complex entities like NEHRP and the Interagency Committee on Seismic Safety in Construction (ICSSC) is likely not feasible for other natural hazards. Lifelines, which are critically important in multihazard approaches, should be covered in the new NEHRP strategic plan. There is a big push for infrastructure renewal in the country now, which can be leveraged to promote lifeline mitigation.

Wright also called for the following:

- Reengagement with ICSSC.
- Support among all NEHRP agencies for social science and public policy research and development.
- Establishment of ongoing relationships with national standards organizations to ensure that the standards used in everyday practice reflect seismic needs.

Following Wright's talk there was a general discussion referencing the comments of all four panelists. One member pointed out that in addition to the push for infrastructure renewal, there is increasing emphasis on green, sustainable communities, and seismic safety is critical to sustainability. A number of members commented on multihazard perspectives, suggesting that NEHRP could market its multihazard opportunities and that multihazard approaches can be an effective tactic for seismic safety implementation at state and local levels and among building owners. In response to a member's question about how to move toward a multihazard focus, Sunder commented that while this could be pursued through the next NEHRP reauthorization, it may be advisable to get the earthquake program in order first.

XXI. Public Comment Period

Zhenming Wang, of the Kentucky Geological Survey, was the only member of the public who spoke to ACEHR. Wang distributed copies of a letter, dated October 12, 2007 (http://www.nehrp.gov/pdf/kgsletter.pdf), sent to ACEHR by the director of the Kentucky Geological Survey. The letter discusses the director's concerns about the scientific methodology used by USGS in developing the national seismic hazard maps. Applegate stated that USGS is aware of these concerns and will continue to work with Kentucky. Wang stated that NEHRP has done an outstanding job in generating earthquake research results, but needs to place additional emphasis on communicating and implementing these results.

XXII. ACEHR Closing Discussion

The committee discussed possible recommendations that ACEHR may want to include in its first report to the ICC. Three categories of recommendations were suggested:

- New activities that should be funded and undertaken immediately to improve the program.
- New activities that should be planned as future program enhancements (and that can perhaps be implemented via budget supplementals).
- Existing activities that should be maintained as essential elements of the program.

A. Immediate Improvements

Following are the major recommendations pertaining to new activities that should be funded and undertaken immediately to improve the program:

- The federal budget enacted for FY 2008 should include the increased funding being sought for NIST and all of the funds currently authorized for FEMA.
- ANSS should be fully funded in the FY 2009 budget.
- Additional programming should be developed that is aimed at expanding implementation of earthquake mitigation measures at the local level. Program activities should be coordinated through state seismic safety commissions where they are available. Consideration should be given to how financial incentives, successes, and long-term risk planning requirements can be used to engage business and expand mitigation efforts.
- More attention needs to be devoted to lifelines and lifeline interdependencies; to preparing for the next earthquake by planning how any attendant supplemental funding should be allocated; and to cultivating NEHRP advocates in Congress, the Executive Branch, or the business community.
- There is a need to bolster next-generation development work on HAZUS.

B. Future Enhancements

Three items were identified as new activities that the committee should recommend be planned as future program enhancements:

- Increased emphasis on lifelines.
- Movement toward a multihazard structure.
- Movement toward a performance and risk basis.

C. Essential Elements to Be Maintained

The following were suggested as existing activities that ACEHR should recommend be maintained as essential elements of the program:

- Promoting the adoption of mitigation measures.
- Developing improved mitigation measures.
- Improving our understanding of earthquakes (this includes the monitoring infrastructure).
- Maintaining the involvement of the social sciences.

- Fully utilizing NEES research facilities.
- Supporting the development and implementation of earthquake scenarios.

D. General Discussion

There were lengthy discussions about possible recommendations relating to NSF, to international collaboration, and to metrics and program evaluation. Generally, however, which of the above categories applied to these recommendations was not explicitly addressed.

Recommendations on NSF

Members discussed what recommendations should be made relating to NSF. One suggested that perhaps some sort of guidance could be given about what should happen to NSF funds freed up by the graduation of the EERCs or about the importance of multidisciplinary research. Another member observed, however, that many researchers who have not been part of the EERCs are happy that the centers' funding will be freed up.

It was suggested that NSF should enhance its support for curiosity-driven research as a way of expanding the earthquake workforce. A member stated that, in light of the EERC graduations, NSF should examine whether there are certain capacities that it has successfully developed through the centers that should continue to be supported. Another suggestion was to recommend that NSF maintain some minimum level of financial support for the graduating EERCs as a way of maintaining some influence over their future activities.

Recommendations on International Collaboration

A member asked whether the committee wanted to make any recommendations about international collaboration. It was pointed out that earthquake science is global and that much can be learned from earthquakes occurring in other countries, and that NIST is looking at how research is increasingly being done internationally and the consequent importance of international standards. A final comment was that any recommendations should refer not only to what we can learn from other countries, but also to what we can share with them.

Recommendations on Performance Metrics and Program Evaluation

The chairperson asked whether the committee wanted to make any suggestions about performance metrics. One member advised that the committee not get involved in the development of formal program metrics. Another member concurred, stating that the committee should concentrate on making recommendations rather than on burdening the agencies with metrics.

Members questioned how ACEHR could evaluate NEHRP's progress without using some sort of performance measures, and an individual suggested that ACEHR use available performance data that it considers significant as a supporting adjunct in its work, but that the committee's primary method of evaluation should be the application of members' expertise and judgment.

A member asked whether ACEHR's evaluative approach should be to decide whether each NEHRP agency is meeting its statutory requirements, or to look at the progress of mitigation in the field (i.e., program effectiveness). Another responded that since NIST and NSF do not work at the local level, that approach may not work for them. Surveys or focus groups were mentioned

as possible tools for gauging mitigation progress at the local level. Other suggestions were to look at the tools that have come out of NEHRP's work and how well they are being applied; at levels of awareness and preparedness among the general public; and at state and local preparedness, response, and mitigation accomplishments.

The chairperson asked the committee for a consensus on whether it wants to use metrics or rely on expert judgment. One person observed that the current statutory language may not be as good as it could be, so the committee might want to recommend revisions for the next NEHRP reauthorization. Another responded, however, that it may be better for the committee to focus on the new strategic plan, and assume that its execution will satisfy the statutory requirements. It was then suggested that the agencies that are leading the development of individual plan objectives be asked to consider metrics that might be appropriate for those objectives. These metrics could then be included in the management plan that must be developed to accompany the strategic plan.

XXIII. Summary and Wrap-up

Chris Poland announced that the primary agenda item for the next ACEHR meeting will be a review of the 2008–2012 draft NEHRP strategic plan. After some discussion, it was determined that the date and location of this meeting will not be set until the ICC has met and approved the release of the draft plan. ACEHR will then meet to develop consensus revisions for incorporation into the draft plan.

XXIV. Adjournment

Chris Poland thanked the members for their attendance and contributions to this meeting. The meeting was adjourned at 4:00 p.m.