

National Earthquake Hazards Reduction Program (NEHRP)
Advisory Committee on Earthquake Hazards Reduction (ACEHR)
March 2-3, 2022
Virtual Meeting Summary

Attendees (listed alphabetically by category)

ACEHR Members

Glenn Rix, Chair	Geosyntec Consultants, Inc.
Lucy Arendt, Vice Chair	St. Norbert College
Ann Bostrom	University of Washington
Robert Carey**	Utah Division of Emergency Management
David Cocke	Structural Focus
Gregory Deierlein	Stanford University
Susan Dowty	International Code Council
Robert Ezelle	Washington Military Department
Thomas Heausler	Consulting Structural Engineer
Ryan Kersting	Buehler
Anne Meltzer	Lehigh University
Danielle Mieler	City of Alameda
Jonathan Stewart	University of California, Los Angeles
Douglas Wiens	Washington University in St. Louis

NEHRP Agency Representatives

Luciana Astiz	National Science Foundation
Michael Blanpied**	United States Geological Survey
William Blanton	Federal Emergency Management Agency
Tina Faecke	National Institute of Standards and Technology
John “Jay” Harris	National Institute of Standards and Technology
Gavin Hayes	United States Geological Survey
Michael Mahoney	Federal Emergency Management Agency
Steven McCabe	National Institute of Standards and Technology
Jacqueline Meszaros	National Science Foundation
Siamak Sattar	National Institute of Standards and Technology

Others

Jason Averill	National Institute of Standards and Technology
Tanya Brown-Giammanco	National Institute of Standards and Technology
Joannie Chin	National Institute of Standards and Technology
Dustin Cook**	National Institute of Standards and Technology
Jazalyn Dukes	National Institute of Standards and Technology
Ryan Janda**	Federal Emergency Management Agency
Katherine Johnson	National Institute of Standards and Technology
James Olthoff*	National Institute of Standards and Technology Acting Director
Richard Osterman*	Department of Commerce
Linda Rowan	Congressional Research Service
Howard Stronach**	Federal Emergency Management Agency
Kevin Wong	National Institute of Standards and Technology

*Attended Wednesday only

**Attended Thursday only

I. Welcome

As Designated Federal Officer (DFO) for ACEHR (or Committee), Ms. Tina Faecke called the meeting to order at 1:00 pm EST, took roll call for the Committee members, and confirmed the quorum requirement was satisfied. She announced the meeting will be recorded and then introduced the Acting NIST Director, Dr. James Olthoff, who thanked the Committee for their engagement and active participation and emphasized the importance of the Committee's assessment. He welcomed the newest member, Mr. David Cocke. He also expressed his appreciation to the Committee Chairperson, Dr. Glenn Rix, for his valuable and dedicated leadership to the Committee, as he will be completing his second term at the end of March. Dr. Olthoff noted that the Committee would receive an update on:

- NEHRP Strategic Plan
- West Coast ShakeAlert Earthquake Early Warning (EEW) system rollout completed
- Building Code change proposals
- USGS Circular 1242 NEHRP post-earthquake investigations
- NEHRP agency collaboration efforts

Rix thanked Dr. Olthoff for the kind words and an overview of the topics being presented over the next two days. Rix asked Cocke to introduce himself and provide some personal background information.

Rix affirmed the purpose of the meeting was to receive NEHRP responses to the September 30, 2021 ACEHR biennial report and to review and assess the latest NEHRP activities. Rix asked the Committee if they had any questions. There were none.

II. Annual Ethics Briefing

Mr. Richard "Eric" Osterman from the Department of Commerce Ethics Law and Programs Office gave a briefing on ethics rules for Special Government Employees, and thanked the Committee for completing their online financial disclosure forms in January.

III. Staff Changes

Dr. Steven McCabe, Associate Division Chief, Materials and Structural Systems Division, provided a summary of the NIST Engineering Laboratory staff changes regarding the statutory programs.

IV. NEHRP (or Program) Update

Dr. John Harris, Acting NEHRP Director, provided a brief update on the status of the NEHRP Strategic and Management Plans, the Interagency Coordinating Committee meeting plans, and the U.S. Government Accountability Office's Assessment Report on NEHRP. Harris' update is available at https://nehrrp.gov/pdf/NEHRPUpdate_ACEHRMarch2022.pdf.

Discussion:

The Committee asked if the management plan will have specific metrics for measuring progress on the updated strategic plan since the original strategic plan didn't have a management plan. NIST reminded the Committee the management plan is still in the development process, but agreed to discuss this question of including a progress indicator with the Program Coordination Working Group (PCWG). The primary purpose of the management plan is to enable adaptation

and the PCWG needs to determine how to make it organic to allow change. Initiative funding-based opportunities could be included in the plan to assist with redirecting agency efforts.

V. NEHRP Responses to the 2021 ACEHR Report Recommendations

Harris presented NEHRP agency responses

(<https://nehrp.gov/pdf/NEHRPResponses30Sept21ACEHRreportFINAL.pdf>) to the six recommendations identified by the Committee in their September 2021 Biennial Report (<https://nehrp.gov/committees/reports.htm>).

Discussion:

The Committee asked if identifying opportunities for the agencies to coordinate activities related to functional recovery rise to the level of a need to convene the Interagency Coordinating Committee. There was a concern that the NEHRP agencies will return to their silos. Mahoney noted that NIST and FEMA already held meetings to begin coordinating efforts on a functional recovery workshop. Agency coordination direction/resources and concurrence on the updated strategic plan are action topics for an Interagency Coordinating Committee meeting.

A question was raised regarding multi-agency coordination on emerging topics such as functional recovery, and what is needed to get better coordination on key definitions, concerns, and concepts among the PCWG for activities being planned. Harris reported that programmatic coordination efforts are a standing agenda topic for monthly PCWG meetings. Specific activities are coordinated within each agency based on the individual agency resources, priorities, and cultures but shared during PCWG meetings.

A concern was expressed by the Committee for the need to define “multi-hazard” which is interpreted differently, including the risks and factors involved. Harris agreed there is a need to learn how hazards interact and then define that as well as the results. McCabe noted that NEHRP and the National Windstorm Impact Reduction Program have been working together on hurricane and tornado reconnaissance events, including social science effects.

For NEHRP’s response to the fourth recommendation in ACEHR’s September 2021 report, only USGS earth and social science was addressed regarding lifelines and structural systems research on the use of EEW alerts. EEW is one of the research priorities for the USGS external grants and provides an opportunity to seek synergies between ShakeAlert and earthquake engineering. In terms of other agency involvement, implementation and advancement of EEW in the west coast is a core objective of the Strategic Plan, so agencies will evaluate activities that support this concept.

VI. NEHRP Activity Reports by Strategic Plan Goals

Harris provided an overview of the reporting process for the major NEHRP activities since the April 12-13, 2021 ACEHR meeting based on the updated goals. Harris’ overview is available at https://nehrp.gov/pdf/ProgramActivityUpdates_ACEHRMarch2022.pdf

A list of Program activities since the April 2021 ACEHR meeting are linked within the meeting agenda at [https://nehrp.gov/pdf/ACEHR%20mtg%20agenda_2-3March2022%20\(FINAL\).pdf](https://nehrp.gov/pdf/ACEHR%20mtg%20agenda_2-3March2022%20(FINAL).pdf). These activities are categorized as legislatively-defined focus areas or Program identified focus areas to support the updated strategic plan as well as ACEHR recommendations. Each agency will highlight one or two projects from their list. Time was allocated for open dialogue after each agency update.

FEMA Updates - Mr. William Blanton, FEMA's Earthquake and Wind Programs Branch Chief, noted staff changes at FEMA. Mr. David Javier, State Assistance Program Manager, retired and FEMA is currently working on hiring his replacement. Ms. Christina Aronson, Civil Engineer from the FEMA region 8 office, and working remotely from Colorado. The FEMA Notice of Funding Opportunity is not released yet, but information on the grant program is included in the activities list linked with the agenda.

Mr. Michael Mahoney, Senior Geophysicist in FEMA's Earthquake and Wind Programs Branch, highlighted two of the four new technical guidance publications, FEMA's Applied Technology Council Seismic Code Support Committee changes, and enhanced performance metrics for the functional recovery of buildings and infrastructure. Mahoney's presentation is available at <https://nehrl.gov/pdf/4FEMAProgramUpdateACEHRMarch2022.pdf>.

Discussion:

The Committee inquired if the FEMA Building Code Strategy document would be shared. The document isn't available yet online, but Blanton offered to email a copy to Faecke for distribution.

NSF Updates - NSF updates were given by Dr. Luciana Astiz, Program Director, Earth Science Division, Geoscience Directorate and Dr. Jacqueline Meszaros, Science and Technology Advisor, Natural Hazards, Disasters and Resilience, Division of Civil, Mechanical and Manufacturing Innovation, Directorate for Engineering. A pie chart was presented displaying the nearly 140 NEHRP-related projects awarded by the Directorate in addition to a bar graph showing the awards by NEHRP goals and objectives. The joint NSF/NIST Disaster Resilience Research Grant awards will be announced soon. The NSF Rapid Response Research (RAPID) grant awards collect data quickly following an earthquake. NSF provides infrastructure for science research to benefit the entire research community. Funds for NSF Centers come with a mandate to engage with relevant communities and populations to conduct educational activities and sustain themselves beyond NSF's support. NSF's update is available at https://nehrl.gov/pdf/NSFProgramUpdate_ACEHRMar2022.pdf.

Discussion:

There is a lot of discussion now regarding open science and in particular locating datasets alongside computational infrastructure in the cloud to facilitate scientific advancement, especially artificial intelligence awards related to seismic. Who has the responsibility for funding this? Has NSF had discussions about broader strategies for supporting this kind of open science infrastructure, and where does DesignSafe fit into any broader strategy for supporting open science? Astiz responded in terms of seismic data, NSF funded the transition for the data to go into cloud storage and to build tools through the cloud. Interoperability is the key here and people will have different roles.

The Committee requested the list of NEHRP-related awards (approximately 140). Astiz emailed the list of projects from March 2021 to April 2022 to the ACEHR members.

VII. Closing Remarks

Rix reviewed the agenda for the second day and expressed his appreciation to FEMA and NSF for their excellent updates.

Harris expressed his appreciation to the Committee Chairperson for his valuable and dedicated leadership to the Committee. He also recognized Mr. Ryan Kersting for his valuable contributions and active participation on the Committee, as he will be completing his second term at the end of May.

VIII. Adjournment for the Day

Faecke thanked the ACEHR members for their participation and reminded everyone to use the same WebEx information to join the meeting tomorrow.

The meeting was adjourned at 3:59 pm EST.

ACEHR MEETING SUMMARY – Day Two

March 3, 2022 (1:00-4:00 pm, EST)

I. Call to Order and Opening Remarks

Committee DFO Faecke called the meeting to order at 1:00 pm EST, took roll call for the Committee members, and confirmed the quorum requirement was satisfied. She reminded everyone the meeting will be recorded.

Rix reviewed the agenda for the day.

II. Public Input Period

Committee DFO Faecke reported that no one from the public registered to speak.

III. Program Activity Updates (continued)

Federal agency representatives resumed Program activity updates for the Committee, moderated by Harris.

USGS Updates - Dr. Gavin Hayes, Senior Science Advisor for Earthquake and Geologic Hazards, provided the USGS update. Hayes described updates to the earthquake early warning system, following statewide ShakeAlert rollouts in California, Oregon, and Washington. He then reviewed the progress made on updating USGS Circular 1242 for NEHRP post-earthquake investigations. His presentation is available at <https://nehrp.gov/pdf/USGSProgramUpdateACEHRMarch2022.pdf>.

Discussion:

The Committee inquired about the degree of collaboration with USGS on the new NSF hazard centers. The Southern California Earthquake Center (SCEC) is focused on southern CA involving collaboration with USGS - is it thought that the new centers will also involve USGS collaboration? Is this collaboration ongoing and does it include collaboration with NSF on subduction zones? Hayes acknowledged there are several areas of overlap between NSF and USGS. USGS is committed to continue discussions with NSF. NSF is waiting for proposals in March and then the review process will begin and collaboration with USGS will be determined.

A question was raised asking if there are any long-term plans to extend the EEW program outside of the western U.S. Hayes responded there are no current plans to extend ShakeAlert, although USGS is guided by their appropriations. Until USGS receives legislative guidance and additional funding, ShakeAlert is unlikely to be extended. Any extension would require an implementation plan, would include a cost-benefit analysis.

Does the USGS Circular 1242 include coordination with the NSF-funded Education Engineering Research (EER) following a major earthquake? Most groups including those funded by NSF are being engaged in the update process assumption, but USGS can follow-up with more specifics. NSF has great EER representation (including DesignSafe) on the writing and review committees for updating 1242. The challenge is that none of the EER's are an operational body to persist over time so they aren't officially in the federal loop long-term. Who is playing the coordinator role after a major urban CA earthquake: the Earthquake Engineering Research Institute (EERI), CONVERGE, or federal agencies? It is critical to have conversations regarding coordination before the earthquake happens. The circular will provide guidance on coordination and will define the various roles.

Will the USGS Circular 1242 update address any aspects of post-event investigations for cascading hazards, in particular tsunamis or landslides? Who is doing the post-event assessments across federal agencies? There are parallel discussions regarding tsunamis and Circular 1242, and there are similar conversations regarding landslides, but USGS will follow-up and get back to ACEHR about that.

Most EEW system mistakes are related to station density, but mistakes will decrease as station density improves. If the network doesn't surround the earthquake, ShakeAlert may have an issue with offshore earthquakes. Eastern CA shares similar problems. Technical implementation plans for ShakeAlert focused first on the high-risk urban areas and station density in Eastern CA has not improved until recently, which led to warnings for earthquakes over the past year to take longer (before station density improved). USGS goes through an after-action process to evaluate the algorithms and alert delivery process to improve the inner workings of ShakeAlert. Are there any efforts investigating offshore stations and what is the likelihood of progress? Any effort to expand ShakeAlert would require a cost-benefit analysis.

Are there any ongoing discussions about integrating crowd-sourced data with ShakeAlert data? Low cost sensors are within the research realm and USGS is exploring how the lower quality sensors might benefit ShakeAlert.

NIST Updates - An update for the Earthquake Engineering Group (EEG) at NIST was provided by Dr. Siamak Sattar, Acting EEG Leader, Materials and Structural Systems Division. He provided background information on the NIST and FEMA joint effort in developing the NIST FEMA Functional Recovery Report ([FEMA P2090 – NIST SP 1254](#)) and highlighted ongoing efforts related to functional recovery. Sattar's presentation is available at https://nehrp.gov/pdf/NISTUpdate_ACEHRMarch2022.pdf.

Discussion:

What is the level of awareness, interest, and acceptance of functional recovery efforts outside of the western U.S.? It depends on the audience (professionals familiar with codes or business

managers). There is a need for education and outreach on the concept of functional recovery across hazards in the U.S.

Can you provide an estimated timeframe for when some functional recovery items (prescriptive design requirements, FEMA P-58 framework, provisions included in the NEHRP Provisions) will be completed? By mid-2023, NIST will finalize the prescriptive design requirements project by developing a generalized framework for structural systems and then will use that framework to develop a specific prescriptive design requirement for reinforced concrete moment frames. Once that framework is developed, hopefully it will be adopted to develop similar requirements for different structural systems.

The 12th National Conference on Earthquake Engineering (12NCEE) hosted by EERI will include a mini workshop to present some of the data collected during the five functional recovery workshops. NIST used that data to develop a preliminary framework for functional recovery and would like to gain feedback from the experts and collect additional data before deciding whether to hold a follow-up workshop. FEMA will give several presentations on the Applied Technology Council (ATC) 138 project and related functional recovery work at the 12NCEE. The ATC project to revise FEMA P-58 will be completed by this fall and Volume 8 will be published by the end of the calendar year. The Building Seismic Safety Council (BSSC) Provisions Update Committee (PUC) functional recovery provisions is a five-year project just getting underway and will be published with the next NEHRP Provisions in five years. Any follow-on with the ATC-138 project will be determined after the revised P-58 is published this fall. NIST has a cost-benefit project for designing for functional recovery looking at four different structural systems (reinforced concrete moment frames, steel moment frames, buckling-restrained braced frames, and core walls). During the 12NCEE, a NIST economist will present some findings from that ongoing effort and will communicate those findings to the PUC. The Committee encouraged NIST and FEMA to continue working together on functional recovery efforts.

IV. FEMA Grant Programs Presentations

The first presentation on *Building Resilient Infrastructure and Communities* (BRIC) was given by Mr. Ryan Janda, FEMA's Non-Disaster Grants Implementation Branch Chief, Hazard Mitigation Assistance Division. His presentation is available at https://nehrp.gov/pdf/FEMAGrants_BRIC_ACEHRMarch2022.pdf.

The second presentation on Hazard Mitigation Grant Program (HMGP) was given by Mr. Howard Stronach, FEMA's Disaster Grants Implementation Branch Chief, Hazard Mitigation Assistance Division. His presentation is available at https://nehrp.gov/pdf/FEMAGrants_HMGP_ACEHRMarch2022.pdf.

Discussion:

Regarding BRIC, could you please explain the requirements for cost-effectiveness a little further and how seismic vulnerability studies and/or community resilience building inventory programs (to gather data needed to actually develop a mitigation program) may or may not qualify? All mitigation projects for BRIC and HMGP must meet a benefit cost analysis showing a benefit cost ratio of 1.0 or greater. Applications for a seismic vulnerability study or a community resilience building inventory that are part of a planning related activity where that information is incorporated into a future update of a mitigation plan, there is no cost effectiveness requirement. Sometimes states use a cost benefit analysis as a ranking factor for HMGP.

The 2015 Hazard Mitigation Assistance Guidance is being updated and will be released in several months for public comment. Subscribe to the Hazard Mitigation Assistance GovDelivery (https://public.govdelivery.com/accounts/USDHSFEMA/subscriber/new?topic_id=USDHSFEMA_1324) to receive additional information.

There are some barriers to utilizing the grant programs such as the need to be construction ready, the three-year project period and administrative burden. Is FEMA looking at those issues at all in its program design, in addition to supporting under resourced communities with cost-share? California's mitigation plan is currently being reviewed by FEMA and they are trying to apply for Hazard Mitigation Grants now with many challenges. FEMA is trying to expand the period of performance (PoP) for subgrants by one year but that change hasn't been approved yet. FEMA routinely provides extensions to the PoP if needed, as long as the projects are being managed and completed in a timely manner. Reach out to your hazard mitigation officer for guidance as a first step. Phased projects are also a good option. FEMA has developed some sub application support materials for the 11 most common project types (not seismic retrofit yet), providing what needs to be submitted and that material will be published soon. In the interim, that material has already been provided informally to FEMA's regional offices.

The Committee is interested in hearing more about strategies being considered to help vulnerable communities meet match for mitigation projects. Cost sharing is the number one obstacle to FEMA's grant program. It is difficult to merge other program requirements with FEMA's requirements. FEMA doesn't have any legal authority to increase the federal share to their programs; therefore, they are focusing on organizations that have funding or donated resources available that could be used as match.

The Committee asked if hazard mitigation plan updates (e.g., to take into account new knowledge about climate change and extreme weather events) are an issue. In other words, do requirements for FEMA approved plans translate into requirements for adequately updated plans? FEMA suggested bringing in their mitigation planning team to address these questions and brief the Committee at a future time on the mitigation plan process. It was noted that California updates their project mitigation plan every five years.

V. Closing Remarks

Rix expressed his appreciation for the NEHRP agencies and other ACEHR members and turned the meeting over to the incoming Chair, Dr. Lucy Arendt. Kersting also expressed his appreciation since his term will end in May. Arendt agreed to wait until August 2022 for the next ACEHR meeting, avoiding the last week. It is unclear whether the meeting will be in-person or virtual. Faecke will poll the members to determine the best meeting dates and times.

VI. Adjournment

Faecke thanked everyone for their participation and adjourned the meeting at 4:00 pm.