

Title

NEES a Large Scale Infrastructure for Earthquake Engineering Research

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Abstract

Over a ten year period, the George E. Brown, Jr. Network for Earthquake Engineering Simulation (NEES) has developed a well-managed national network of shared-civil engineering research facilities; a reliable and relevant cyberinfrastructure that connects the laboratories with the global earthquake engineering community; and facilitated a community effort to address the challenges in earthquake engineering.

The state-of-the-art 14 experimental facilities have supported 422 shared-use and industry research projects that have yielded significant advances in earthquake engineering in the form of new design techniques, construction methods and changes to building codes, standards of practice that make the built environment safer, more realistic computational models, and experimental techniques such as hybrid testing. This body of work is described in over 4800 citations of NEES work, and more than 200 doctoral students have been supported.

To connect the community with the NEES network, the NEEScomm Center at Purdue University, headquarters for operations of NEES, has deployed and supports the NEEShub, the platform for collaboration of the NEES cyberinfrastructure, that provides a publically accessible curated data archival system with comprehensive data on past experimental and field investigations on the seismic performance of buildings and other structures. The NEEShub also facilitates access to software applications and high-speed computational tools. Over 2.0 million project files and directories are now stored in the NEES Project Warehouse.

In this presentation, we will describe some of the aspects of the NEES project, briefly illustrate of a broad selection of research projects, and describe how the NEES cyberinfrastructure is having an impact on civil engineering research and practice.

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Bio: Fellow of the American Concrete Institute (FACI), Dr. Julio A. Ramirez is a Professor of Civil Engineering at Purdue University, West Lafayette IN. Dr. Ramirez is a consulting member of the American Concrete Institute (ACI) 318 Building Code Committee; and a voting member of Joint Committee ACI-ASCE 445, Shear and Torsion; and ACI-ASCE Committee 408, Bond and Development of Reinforcement. Dr. Ramirez is presently committed to two major projects: (a) a NEES Research (NEESR)- Grand Challenge research study aimed at identifying collapse triggers in non-ductile reinforced concrete buildings subjected to seismic actions, (b) center director for the George E. Brown Jr. Network for Earthquake Engineering Simulation NEES Operations wards for the period of 2010-2014. Prof. Ramirez currently serves as the Chief Officer of the National Science Foundation funded George E. Brown Jr., Network for Earthquake Engineering Simulation (NEES) and Director of the NEEScomm Center headquarters of NEES Operations in Discovery Park of Purdue University. Dr. Ramirez has served as an

Associate Editor for the Committee on Concrete and Masonry Structures (CCMS) Division of the American Society of Civil Engineers (ASCE) Structural Journal and has also served as referee of technical articles for the ACI Structural Journal, ASCE Structural Journal, ASCE Computing in Civil Engineering, ASCE Transportation, and the Prestressed Concrete Institute Journals. He has been a member of several National Cooperative Highway Research Program (NCHRP) research panels. He has served in NSF proposal review panels for several directorates. He has received the 2000 Delmar Bloem Award and the 2006 Joe W. Kelly Award of the American Concrete Institute. Dr. Ramirez received a Ph.D. in Civil Engineering from the University of Texas, Austin in 1983.

Bio: Thomas Hacker is an Associate Professor of Computer and Information Technology at Purdue University, and a Visiting Professor in the Department of Electrical Engineering and Computer Science at the University of Stavanger in Norway. Dr. Hacker's research interests center around high performance computing and networking on the operating system and middleware layers. Recently his research has focused on cloud computing, cyberinfrastructure, the reliability of large-scale supercomputing systems, and data-oriented infrastructure. Dr. Hacker is the co-leader for Information Technology for the NSF Network for Earthquake Engineering Simulation (NEES), which brings together researchers from fourteen civil engineering laboratories across the country to share innovations in earthquake research and engineering. He received a Ph.D. and M.S. in Computer Science & Engineering from the University of Michigan, Ann Arbor, and a B.S. Physics and Computer Science from Oakland University in Rochester, Michigan.