EARTHQUAKE ENGINEERING RESEARCH INSTITUTE

NEWSLETTER

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Publications

Next Oral History in *Connections* Series: Joseph Penzien

Joseph Penzien

Continuing the work of the late Stanley Scott (see page 3 of March 2002 *EERI Newsletter)*, the EERI Oral History Committee has been at work on further *Connections* volumes. The next volume, on Joseph Penzien, has been completed and will be mailed this month, and other volumes are in process. The popular series, begun a decade ago, has documented the oral histories of Henry Degenkolb, John Blume, Michael Pregnoff, John Rinne, George Housner, William Moore, Robert Wallace, Nicholas Forell, Henry J. Brunnier and Charles De Maria, Egor Popov, and Clarence Allen.

Support for the program has been provided by the EERI general fund and FEMA, and recently the National Science Foundation provided a financial shot in the arm via a grant to EERI to boost the production of other volumes. The committee consists of Bob Reitherman (chair), William Anderson, Roger Borcherdt, Gregg Brandow, Ricardo Dobry, Bob Hanson, and Loring Wyllie. Suggestions for candidates to be interviewed can be sent to the Oral History Committee, c/o Eloise Gilland, EERI Publications Manager, **eloise@eeri.org**.

A photo from the oral history taken at a party attended by Caltrans Seismic Advisory Board Members. Left to right: EERI members Joe Nicoletti, Joseph Penzien, Bruce Bolt, I. M. Idriss, and Jim Roberts.

News of the Institute

2005 Annual Meeting: Ixtapa, Mexico

Marking the 20th anniversary of the Mexico City earthquake, the EERI Annual Meeting Organizing Committee, led by Co-Chairs Richard Klingner and James Jirsa, is putting together an excellent program in collaboration with our Mexican colleagues, led by Sergio Alcocer and Arturo Tena-Colunga. The first Annual Meeting to be held outside the United States, it will take place in Ixtapa, Mexico, February 2-6, 2005. One day longer than previous Annual Meetings, it will have built-in "free time" each afternoon so that participants can take advantage of the unique location.

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Publications

Finding Fault in California

A recently published book, entitled *Finding Fault in California: An Earthquake Tourist's Guide,* was written for nonspecialists as well as earth science and engineering professionals who are interested in California's active fault features. The author is Susan Elizabeth Hough, a geophysicist with the U.S. Geological Survey in Pasadena.

The 272-page paperback book covers the state's most accessible, active, and earth-shaping faults and tells the stories behind the major temblors that have shaken the region. It explores the seismic hazards of the Los Angeles Basin, the San Francisco Bay Area, central California, the Mojave Desert, Death Valley, and the Owens Valley. There is also a chapter on earthquake and volcanic activity in Nevada, the Pacific Northwest, and Mexico. More than 150 black and white photos, maps, and diagrams, most with precise GPS coordinates, illustrate the text. The book features a related web site where the photos can be seen in color.

Finding Fault in California is available from bookstores or directly from Mountain Press Publishing Company at 800/234-5308 or **www.mountain-press.com**.

Two New ATC Reports

The Applied Technology Council (ATC) has released ATC-51-2, *Recommended U.S.-Italy Collaborative Guidelines for Bracing and Anchoring Nonstructural Components in Italian Hospitals.* Funded by the Department of Civil Protection of Italy, this report documents the results of a project to develop guidance for bracing and anchoring nonstructural components in Italian hospitals. The project was conducted as the third phase of a larger cooperative program being conducted by ATC and the Department of Civil Protection to develop recommendations to improve hospital seismic safety in Italy.

Also available is *Recommended LRFD Guidelines for the Seismic Design of Highway Bridges*. The *Guidelines* are based on significant enhancements in the state of knowledge and state of practice resulting from research investigations and lessons learned from earthquakes over the last 15 years. The *Guidelines* consist of specifications, commentary, and appendices designed to be compatible with the existing load-and-resistance-factor design (LRFD) provisions for highway bridges published by the American Association of State Highway and Transportation Officials (AASHTO). The new, updated provisions are nationally applicable and cover all seismic zones, as well as all bridge construction types and materials.

These reports can be obtained by visiting **www.ATCouncil.org**.

Non-Engineered Houses in Latin America

The Institute for the Protection and Security of the Citizen at the European Laboratory for Structural Assessment (ELSA) has released the report *Review of Non-Engineered Houses in Latin America with Reference to Building Practices and Self-Construction Projects*. This 250-page report reviews non-engineered buildings that make up a substantial portion of Latin American residential construction and that are responsible for more than half of the life loss resulting from natural hazards in the region. It is written to serve as an information source for institutions involved in the implementation of projects in the areas of infrastructure reconstruction and risk mitigation.

The report first explores the seismic performance of these structures through cases studies from previous earthquakes. Factors identified with the poor performance of these buildings are discussed. Current housing and post-disaster reconstruction policies in effect in Latin America are presented. Then detailed descriptions of the techniques used for earth-based construction, with a particular emphasis on adobe construction, are provided. Finally, the report provides a detailed review of manuals that support self and assisted construction of earth-based, concrete masonry, and reinforced concrete housing units.

The report can be downloaded by visiting **http://elsad.jrc.it/** and requesting Folder ID: AF-323.

Liquefaction in 2003 San Simeon EQ

The U.S. Geological Survey (USGS) has issued a formal report on the causes of damage to the small San Luis Obispo County (California) beach community of Oceano during the M6.5 December 22, 2003, San Simeon earthquake. Despite being 63 km southeast of the end of the fault rupture, Oceano suffered extensive damage from strong ground shaking and liquefaction-induced lateral spreading. The USGS report concludes that Oceano is subject to site amplification and that the combination of directivity and local amplification caused liquefaction to occur in both artificial and natural sandy soils. The report is based on 37 seismic cone penetration tests (SCPT), five soil borings, and aftershock monitoring conducted by the USGS following the earthquake.

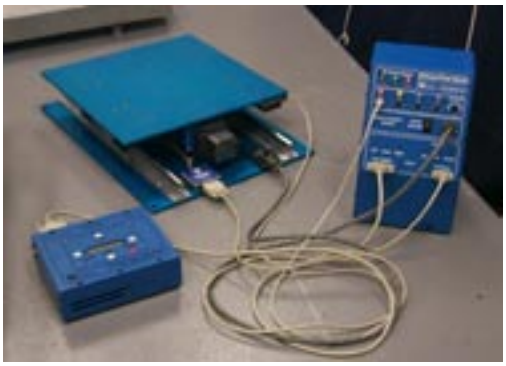
The report, *Liquefaction-Induced Lateral Spreading in Oceano, California, During the 2003 San Simeon Earthquake*, is available at **pubs.usgs .gov/of/2004/1269/**. The SCPT soundings are available at **quake.usgs.gov/prepare/cpt/**.

News of the Profession

Earthquake Engineering Education Activities Using Shake Tables

Because the response of the built environment to time-varying loads such as earthquakes is of great social and economic importance, civil engineering programs have recognized the need to provide an understanding of structural dynamics and earthquake hazard mitigation at the undergraduate level.

In 1998, the University Consortium on Instructional Shake Tables (UCIST) was formed to achieve this goal. From the original 23 universities forming the consortium, it has expanded to more than 80 worldwide. UCIST educates and trains students in earthquake engineering concepts through the integration of hands-on experiments into the undergraduate civil engineering curriculum.



UCIST instructional shake table. See page 4 for more photos of the shake tables in action.

The consortium has developed a series of experiments that are based on the use of a bench-scale shake table. Each institution involved in the program has purchased an instructional shake table laboratory station that can accommodate a variety of experiments. Using these shake tables, students can observe earthquake responses, design and build model structures, modify their structures, measure structural responses, and reproduce several earthquake records. These hands-on experiments help undergraduate students build a foundation for the important topics of structural dynamics and earthquake engineering.

UCIST also facilitates various outreach activities using the shake tables for younger students. The student chapter of EERI at Washington University in St. Louis uses the bench-scale shake table to educate children about earthquakes each February at the St. Louis Science Center during Missouri's Earthquake Awareness Week. Children are able to observe the devastating effects of earthquakes by watching how a doll house responds when placed on a shake table.

In addition, Washington University uses its shake table in the NSF-sponsored GK12 program, a cooperative effort with local middle schools that is designed to introduce engineering and science into middle school curricula. Graduate students help introduce engineering concepts and monitor competitions between small groups of middle school students. The competitions are patterned after the Shakes & Quakes Program developed at the University of Notre Dame (see the *EERI Newsletter*, January 2002, page 9). Each group is given the task of designing a structure that will best survive a simulated earthquake, and the structure's strengths are tested on the last day on a shake table.

Headquartered and managed at Washington University in St. Louis, the UCIST was funded by the National Science Foundation and the Mid-America Earthquake Center. For more information, visit the UCIST web site (**ucist.cive.wustl.edu**) or contact Dr. Shirley Dyke at **sdyke@seas. wustl.edu**.

Annual Meeting

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The program will focus on the multidisciplinary lessons learned from the 1985 event, how the knowledge gained has been implemented, and the institutional impact it has had in each country.

The Mexico City earthquake initiated extensive research into issues such as overstrength and capacity design principles, torsional response of buildings, building separation and pounding, and soft-soil amplification. Sessions will look at these areas and the resulting impacts on building codes in both countries. The 2003 NEHRP Provisions and Mexican provisions regarding design ground motion maps will be analyzed. There will be evaluations of the effectiveness of performance-based design, post-disaster response and recovery, and prediction and warning systems such as the California Integrated Seismic Network and the Mexican Seismic Alert System. Speakers will present the latest information on large-scale urban rehabilitation and urban risk.

Other members of the organizing committee responsible for the dynamic program include Paul Flores, Anna Lang, Ron Mayes, Kim Shoaf, and Carlos Ventura.

Mark the dates of February 2-6, 2005, now and watch for more details on other Annual Meeting activities in future *Newsletters*, in the program brochure to be mailed in the fourth quarter, and by visiting the EERI web site, **www.eeri.org**.

News of the Institute

EERI Student Chapter Activities

Washington University

In February, the EERI student chapter continued its tradition of taking part, along with 15 other institutions, in the Earthquake Awareness Weekend at the St. Louis Science Center. The event is designed to show the possible consequences of an earthquake and to educate the public about what steps to take during and after an earthquake. Chapter members presented two demonstrations. The first was an experiment utilizing a "Tuned Mass Damper," which showed the advantages of "smartly" adding mass to buildings. The demonstration consisted of two small building models on top of an earthquake-simulating shake table: one with a tuned mass damper and one without. This generated much interest from the onlookers. The second demonstration used videos of the most famous earthquakes in the last decade to make people more aware of the danger that earthquakes present.

In November, the University of Missouri-Rolla invited EERI student chapter members at Washington University to a talk given by Dr. Juan Caicedo, who explained his research on structural health monitoring. Both chapters are exchanging ideas for future joint activities.

Display at Earthquake Awareness Week.

University of California, Davis

Four seminars were conducted during the 2003-2004 academic year. David Gutierrez, chief of the California Department of Water Resources, Division of Safety of Dams, discussed design issues related to three earth-fill and rock-fill dams and one roller-compacted concrete dam. The 35 attendees gained an increased understanding of the importance of dam safety. A field trip to the San Francisco-Oakland Bay Bridge was held as a follow-up to the presentation by Gerry Houlahan of Moffat and Nichol, San Francisco, on seismic design issues related to the foundation of the new east span of the bridge and other selected offshore platforms. Houlahan discussed acceptable performance of foundation elements under strong earthquake shaking. Dr. Norm Abrahamson, a seismologist from PG&E, gave a seminar that focused on his involvement in selecting ground motions for the proposed Yucca Mountain nuclear waste repository and on a promising new research field called "paleoseismometry," which could provide a rational methodology for capping rare ground motions to a geologically specific maximum value. A final seminar in May was given by Craig Comartin, president-elect of EERI.

University of Notre Dame

Leo Argiris, principal of Ove Arup, New York City, was the EERI Friedman Family Visiting Professional lecturer. Students chatted with him during lunch about ongoing activities of the Notre Dame chapter and listened to his candid comments about his professional experiences. Argiris delivered a lecture entitled "Regular Structures in an Irregular World" to the Notre Dame student body, faculty, and members of the community. The lecture focused on the design implications of evolving complex architectural trends and how they affect seismic design. Attendees thought that the seminar was informative, thorough, and interesting, and felt that the program was a tremendous benefit to the university.

The American Society of Engineering Education featured the University of Notre Dame EERI student chapter's "Shakes & Quakes" outreach program in its January 2004 e-newsletter (see **www.engineeringk12.org/newsletter/jan2004.cfm**). The publicity has generated several supportive comments regarding this innovative program. The chapter would like to thank all the students, faculty, and organizations whose help facilitated this program in the past and who continue their support with their time and financial contributions.

Students testing their designs as part of the Shakes & Quakes outreach program.

More information about these activities is available on the chapter web site, **www.nd.edu/~eeriund/**.

University of Minnesota

Activities for the year began with a shake table demonstration in the rotunda of the Civil Engineering Building for visiting alumni. The 2003 Friedman Family Visiting Professional lecture on the Shanghai World Financial Center was given in October by Les Robertson of Leslie E. Robertson Associates. Robertson

met with small groups and talked about his life experiences and philosophy both before and after his presentation. In March 2004, Chris Poland of Degenkolb Engineers presented "Performance-Based Engineering: Who Decides When We Are Safe Enough?" The students had the opportunity to talk to Poland about his company's projects and his professional experiences.

Chapter members gave demonstrations during the year at the community school science fair and other venues. In February, high school girls were invited to attend the "Gopher Short Course." The class began with a demonstration of earthquake hazards and a discussion of some mitigation methods. Students then used their math skills to predict the natural frequencies of several single-degree-of-freedom (SDOF) structures. Their calculations were compared with the performance of an SDOF system on the department's small-scale shake table to show how math and science correlate to the experiments. The students built their own structures, which were tested on a shake table to determine the most effective structure. The chapter's goal in providing this experience is to excite students about math, science, and civil engineering. The course was repeated in May for home-schooled students.

University of Texas, Austin

In April, EERI 2004 Distinguished Lecturer and University of Texas Professor Ken Stokoe presented "The Increasing Role of Stress Wave Measurements in Geotechnical Earthquake Engineering." Dr. Takayuki Shimazu, professor emeritus at Hiroshima University, Japan, gave a seminar to students in April on "Aseismic Design of Building Structures in China." A special seminar is being planned for the summer to be given by David Teasdale, the chapter's industry contact.

Book Review

Earthquakes by Bruce A. Bolt

The following review was submitted by Anil Chopra.

The fifth edition of EERI member Bruce A. Bolt's book *Earthquakes* (W. H. Freeman, New York, 2003, ISBN 0-7167-5618-8), like the earlier editions, captivates the reader. One gets engrossed to the point that it is difficult to put the book down. Rare among books on technical subjects, the quality of this particular book is a tribute to Professor Bolt's writing skills and mastery over seismology.

Technical discussions of how earthquakes are studied and how the results of those studies are used to lessen the human, environmental, and societal impact of future earthquakes are interwoven with anecdotes and quotes from eyewitnesses, including those from ancient events. Accompanying this engrossing narrative are many photographs, maps, and color plates that illustrate the various ideas that are discussed.

The book is organized into twelve chapters: What one feels in an earthquake; where earthquakes occur; faults in the earth; the causes of earthquakes; measuring earthquakes; exploring inside the earth; earthquakes and plate tectonics; the size of an earthquake; volcanoes, tsunamis, and earthquakes; events that precede an earthquake; dangers from earthquakes; and reducing earthquake risk.

The fifth edition includes significant new material:

- "Applied seismology" boxes discuss current seismologically interesting and relevant topics and lead readers to web resources that further explore these topic.
- An expanded list of relevant web sites that complement the material covered in the book.
- Most recent earthquake histories up until June 2003 are described with emphasis on their social and scientific interest. The new ones included in this edition are the tragic 1999 earthquakes in western Turkey and the Chi Chi earthquake in Taiwan; the devastating 2001 Gujarat earthquake in northwest India; and the 2002 earthquake in the interior of Alaska.

Written in an easily understandable style that gives it a broad appeal beyond the confines of earthquake engineering, this introduction to contemporary seismology is must reading for every earthquake engineer. It is also excellent reading material for college engineering students.

News of the Institute

New EERI Student Membership

At its June 2004 meeting, the EERI Board of Directors approved a new Student Membership, effective immediately as students renew for the 2004-05 academic year.

Regular Student Membership dues up to now have been $30 per year. The Board's recent decision reduced dues to $20 per year. Students will receive electronic access only to the *Newsletter* (through the EERI web site) and *Earthquake Spectra* (through the American Institute of Physics platform), but not hard copies of these publications, unless the costs are underwritten by outside funding sources (such as Learning from Earthquakes reports).

For the reduced dues, students will also get reduced registration rates for meetings.

Annual dues for students who wish to continue to receive hard copies of all EERI publications will be $30.

Announcements

Structural Steel Seminars

The Steel Structures Technology Center, in cooperation with the International Code Council (ICC), will be hosting the following seminars.

Structural Steel Inspection Seminar: A two-day Structural Steel Inspection Seminar will include the inspection of structural steel, steel fabrication and erection, welding, bolting, metal decks, steel bar joists and joist girders, shear connectors, and fabrication plant qualification, all as applicable under the building code. The requirements and application of various standards (AISC, AWS, RCSC, SJI, SDI, and ICC) will be discussed in detail. The seminar also qualifies as appropriate training for certification renewal for active International Conference of Building Officials and ICC Certified Special Inspectors of Structural Steel and Welding. The seminar has been offered since 1990 and is continuously updated to the most recent codes and standards.

West Coast Seismic Steel Connections Seminar: A one-day seminar entitled "Steel Connections: Seismic Applications 2004" will be of particular interest to structural and civil engineers, building officials, steel fabricators and erectors, testing agencies, inspectors, and others involved in steel building construction in seismic regions. It will focus on the design and details of welded and bolted connections, incorporating the AISC Seismic Provisions, including updates for the 2005 Provisions, the pending new AISC standard Prequalified Connections for Special and Intermediate Steel Moment Frames for Seismic Applications, the draft American Welding Society standard D1.8 for seismic applications, FEMA-350 *Recommended Seismic Design Criteria for New Steel Moment-Frame Buildings*, and FEMA-353 *Recommended Specifications and Quality Assurance Guidelines for Steel Moment-Frame Construction for Seismic Applications*.

Seminars have been scheduled in cities around the country. For locations, dates, and registration information, visit **www.steelstructures.com**.

Emergency Managers Conference

The International Association of Emergency Managers (IAEM) will host the 52nd Annual IAEM Conference November 5-11, 2004, in Dallas, Texas, with the theme of "Collaboration: The Key to Success in Emergency Management." Featured sessions include the National Incident Management System and media training; profiles of successful private sector programs; interoperable communications, hazards analysis, and mutual aid; a collaborative framework for emergency, business continuity, and risk management; terrorism preparedness funding sources and tips for success; and international disaster case studies. To register or for more details, visit **www.iaem.com** or call 703/538-1795 x2.

Renewing the Urban Landscape Congress

The theme for the Council on Tall Buildings and Urban Habitat's 7th World Congress is "Renewing the Urban Landscape." It will take place in New York City October 16-19, 2005, and will bring together building industry leaders from around the world to brainstorm innovations for rehabilitating, redeveloping, and reinventing the urban landscape. It will provide its participants a first-hand opportunity to tour the sites of the rebuilding process in lower Manhattan and meet the leaders and innovators in the building industry who are shaping Manhattan's pioneering urban redevelopment project.

Other significant urban redevelopment projects being implemented around the world will be discussed in detail; their leading participants will share their experiences and insights, citing specific examples of successes and failures, as well as their projections for the future.

The outcome of the congress will be a comprehensive summary of the significant attempts by the planners, architects, engineers, owners, contractors, and policy makers to strengthen local and national economies through urban redevelopment.

More information is available from **www.ctbuh.org** or e-mail **info@ctbuh.org**.

Existing Building Code Seminar

The New Madrid EERI Chapter, in cooperation with the American Society of Civil Engineers, the American Institute of Architects, and the Structural Engineers Association of Kansas and Missouri, is sponsoring a seminar on the application of the 2003 *International Existing Building Code* (IEBC), which was recently adopted by the city of St. Louis. The IEBC provides guidance for the seismic rehabilitation of existing structures.

The seminar will be held on September 21 in St. Louis, Missouri. Topics will include the following:

- classification of work,
- requirements for each work classification,
- historic buildings,
- relocated or moved buildings,
- construction safeguards, and
- seismic hazard reduction and strengthening.

Advance registration ($50) is required. Four continuing education units (CEUs) will be awarded. For additional information, contact Teresa Walker at 314/994-7007.

CALENDAR

Items that have appeared previously are severely abbreviated. The issue containing the first appearance, or the most informative, is indicated at the entry's end. Items listed for the first time are shown in **bold**.

SEPTEMBER

3-4. VIII Mexican Symposium on EQ Eng., Tlaxcala, Mexico. Info: **www.smis.org.mx** (7/04)

10 (new date). NEES@UIUC Training Day, Urbana, IL. Info: **nees.uiuc.edu/TrainingDay.asp** (8/04)

14-17. NDE/NDT for Highways & Bridges 2004, Buffalo NY. Info: **www.asnt.org/events/events.htm** (12/03)

21. Existing Bldg. Code Seminar, St. Louis, MO. See page 6. (9/04)

22-24. IABSE Symp. on Metropolitan Habitats & Infrastructure, Shanghai, China. Info: **www.iabse.org** (8/04)

26-29. Int'l Code Council Annual Conf., Salt Lake City, UT. Info: **www.iccsafe.org/news/annual/Forum2004** (7/04)

26-30. 2004 National EQ Conf., St. Louis, MO. Info: **www.earthquakeconference.org/** (4/04, 6/04)

29-Oct. 1. Annual Conf. on Deep Foundations, Vancouver, B.C., Canada. Info: **www.dfi.org** (12/03)

OCTOBER

5-6. Pacific Security Expo & ABAG General Assembly, Oakland, CA. Info: **www.abag.ca.gov** (8/04)

18-20. 3rd Int'l Conf. EQ Eng., Nanjing, China. Info: **3icee.njut.edu.cn/** (4/04)

25-Nov. 5. 7th Workshop on 3-D Modelling of Seismic Waves, Trieste, Italy. Info: **agenda.ictp.trieste.it/smr.php?1586** (2/04)

28-29. Bridge Seismic Design Workshop, Cape Girardeau, MO. See page 8. (9/04)

NOVEMBER

5-11. 52nd Annual IAEM Conf., Dallas, TX. See page 6. (9/04)

15-19. Committee on Safety of Nuclear Installations Workshop on Seismic Input Motions, Tsukuba, Japan. Info: **www.nea.fr/html/nsd/workshops/SEIS2004/index.html** (4/04)

28-Dec. 3. Coping with Risks Due to Natural Hazards in the 21st Century, Monte Verità, Switzerland. Info: **www.csf.ethz.ch/services/registration/** (8/04)

DECEMBER

8-20. 4th Int'l Conf. on Dam Engr., Nanjing, China. Info: **www.dam04.com** (1/04)

2005

JANUARY

9-13. TRB Annual Meeting, Washington, DC. Info: **www.trb.org** (8/04)

13-16. Int'l Symp. on EQ Eng., Japan. (2/04)

18-20. 1st Int'l Conf. on Urban Disaster Reduction, Kobe, Japan. Info: **www.eeri.org/news/meetings.html** (7/04)

31-Feb 3. IMAC XXIII, Orlando, FL. Info: **www.sem.org** (6/04)

FEBRUARY

2-6. EERI Annual Meeting, Ixtapa, Mexico. Info: **www.eeri.org. See page 1.** (4/04, 7/04, 9/04)

19-22. Int'l Assoc. for Bridge Struc. Eng. Conf., New Delhi, India. Info: **www.iabse.org** (11/03)

APRIL

6-9. North American Steel Construction Conference, Montreal, Canada. Info: **www.aisc.org/nascc** (8/04)

MAY

30-June 1. ERES 2005, Skiathos, Greece. Info: **www.wessex.ac.uk/conferences/2005/eres05** (7/04)

AUGUST

21-24. Pipelines 2005, Houston, TX. Info: **www.asce.org/conferences/pipelines2005/** (8/04)

22-24. ConMat'05, Vancouver, BC, Canada. Info: **www.civil.ubc.ca/conmat05/** (7/04)

SEPTEMBER

14-16. IABSE Structures & Extreme Events, Lisbon, Portugal. Info: **www.iabse.org/lisbon** (7/04)

20-23. 3rd Int'l Structural Eng. & Const. Conf., Shunan, Japan. Info: **www.tokuyama.ac.jp/tcss1/ISEC_03/** (4/04)

OCTOBER

16-19. Council on Tall Bldgs. & Urban Habitat, New York, NY. See page 6. (9/04)

2006

APRIL

18-21. 8th U.S. Nat'l Conf. on EQ Eng. (8NCEE), EERI Annual Meeting, SSA Annual Meeting, Disaster Resistant California, San Francisco, CA. Info: **www.eeri.org** (5/04)

AUGUST

14-17. 5th Int'l Conf. on Behavior of Steel Structures in Seismic Areas (STESSA), Tokyo, Japan. E-mail: wada@serc.titech.ac.jp (9/04)

Announcement

NEHRP on the Web

The Federal Emergency Management Agency has launched a new web site dedicated to the National Earthquake Hazards Reduction Program (NEHRP). The site has links to many resources, including the four leading NEHRP agencies (FEMA, the National Institute of Standards and Technology, the U.S. Geological Survey, and the National Science Foundation), state agencies, best practices, mitigation success stories, news releases, a calendar of events, and online publications such as the yellow FEMA hazard mitigation series.

Explore this new comprehensive information resource at **www.fema.gov/hazards/earthquakes/nehrp/**.

Announcements

NEESgrid 3.0 released

NEESgrid 3.0, the final version of the system integration component of the George E. Brown, Jr., Network for Earthquake Engineering Simulation (NEES), has been released. NEESgrid is the result of an intensive collaborative effort led by the National Center for Supercomputing Applications (NCSA) at the University of Illinois at Urbana-Champaign.

The NEESgrid core features include passive and active telepresence services that allow remote observation and control of an experiment; streaming data services that enable data transfer from the local acquisition system to remote users and to repositories; and data and metadata management services that allow storing and retrieving data from the NEESgrid repository. User access to this collaborative environment is provided by a web-based user interface that integrates a suite of tools for experiment planning, execution, analysis, and publication.

The system uses core grid services for sign-on, security, and managing resources. NEESgrid 3.0 incorporates the following new features:

- OpenSEES [**opensees.berkeley.edu/**], a framework for developing models and analysis methods for the simulation of structural and geotechnical systems;
- FEDEASLab, a MATLAB toolbox for nonlinear structural simulations under static or transient conditions;
- E-NoteBook, which enables NEESgrid users to associate notes with NEES projects and data in the NEES repository and search their combined notes and data through the user interface;
- a simulation portal, which provides users access to the OpenSEES simulation software, computational resources available on NEESgrid, and the ability to interact with simulation models and results in the NEESgrid repository. It is integrated into the CompreHensive collaborative Framework (CHEF); and
- DataTurbine [**www.creare.com/rbnb/**], which provides high-quality multi-channel streaming data and replaces the NEES Streaming Data Service of previous releases.

The NEESgrid 3.0 software and the reference documentation are available for download at **www.neesgrid.org/software/**.

Bridge Seismic Design Workshop

A workshop entitled “Geotechnical and Bridge Seismic Design Workshop — New Madrid Seismic Zone Experience” will be held October 28-29, 2004, in Cape Girardeau, Missouri. The main objective is to present a methodology for the geotechnical and structural seismic design of bridge systems in the New Madrid Seismic Zone. This methodology is based on recent research findings by the University of Missouri-Rolla Natural Hazards Mitigation Institute.

The new methodology addresses the uniqueness of earthquake motion (near-fault motion and directivity) and the effects of deep soil stratigraphy on seismic response in the New Madrid Seismic Zone. Participants in the workshop will apply this methodology to the re-design of an existing highway bridge in the vicinity of the New Madrid Seismic Zone. Both retrofit and replacement options will be considered.

For more information, visit **campus.umr.edu/dce/noncredit/facetoface/DistanceContinuingEducationUniversityofMissouri-Rolla.htm**.

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