

MCEER part of newly formed Asian-Pacific Centers Network

MCEER is one of seven centers that are part of a new unique, professional consortium called the Asian-Pacific Network of Centers for Earthquake Engineering Research (ANCER). ANCER was established in October 2001 to enhance the research, education and technology transfer activities of the centers. Its vision is to broaden research and development impacts and mitigation practices through cooperative activities that can best be advanced on a center-to-center basis over a large geographical area.



■ *Members of ANCER are committed to enhancing research, education and technology transfer to reduce seismic hazards.*

The concept of a centers network was introduced during an international workshop organized by the Korean Earthquake Engineering Research Center (KEERC) in Seoul in 2000. Professor Sung-Pil Chang, director of KEERC, suggested developing a formal working relationship among the centers, and the concept evolved into the formation of ANCER.

The first activity of ANCER is the sponsorship of a major international conference on advances and new challenges in earthquake engineering research. The conference will consist of two consecutive back-to-back meetings in Harbin and Hong Kong (see announcement on page 4) and will be held in August 2002.

ANCER has four officers: Dr. S.C. Liu, of the National Science Foundation, serves as the advisor; Dr. Sung-Pil Chang, KEERC, Seoul National University, Seoul, Korea will serve as president for two years (2001-2003); Dr. George Lee, MCEER, will serve as president elect for two years (2001-2003), and president for one year (2003-2004) and Dr. Xiaozhai Qi, Institute of Engineering Mechanics, China Seismological Bureau (IEMCSB), Harbin, China, will serve as secretary/treasurer for five years (2001-2006). Other members are Dr. Daniel Abrams, Mid America Earthquake Center (MAE), Urbana, Illinois, Dr. Jack Moehle, Pacific Earthquake Engineering Research (PEER) Center, Berkeley, California, Dr. H. Kameda, Disaster Prevention Research Institute (DPRI), Kyoto University, Kyoto,

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Seismic Instrumentation of Bill E. Emerson Memorial Bridge

The Bill E. Emerson Memorial Bridge, currently under construction, is a signature, cable-stayed bridge that crosses the Mississippi River near Cape Girardeau, Missouri. Jointly owned by the Illinois and Missouri DOTs, the bridge is located in the New Madrid Seismic Zone, thus necessitating the implementation of seismic hazard mitigation measures.

The Federal Highway Administration (FHWA) initiated the seismic instrumentation project in October of 1996. A group comprised of FHWA, MoDOT, HNTB Corp. (the bridge designer and construction manager for the project), MCEER, US Geological Survey (USGS), and others developed a plan for the seismic instrumentation of the bridge.

MCEER is charged with designing and acquiring the seismic instrumentation network under its Highway Project research program. The bridge is scheduled to be completed by March 2003.

MCEER has employed the USGS to complete the design, finalize the hardware acquisition and prepare a bid package for the hardware. Independent consultants and academia have been providing technical review of the constantly evolving instrumentation plan. It includes instruments to record free-field motions at the surface and downhole locations. It is designed to capture the overall motion

of the cable-stayed bridge, including translational, torsional, rocking and translational soil-structure interactions at the foundation levels. The instrumentation scheme will also provide insight into the horizontal and vertical spatial variation of recorded ground motions.

Currently, two alternative strategies for the instrumentation system are under consideration. The first option involves a conventional scheme and includes on-site recording capabilities without real-time data transmission. However, constantly developing technology in the field now allows adaptation of a wireless instrumentation scheme and real-time data transmission of the recorded data. Thus, coupled with the former, the second alternative provides for continuous recording of data via a Central Recording System (CRS). Accordingly, data acquisition blocks will be equipped with wireless routers which



■ *Computer rendering of the cable-stayed Bill E. Emerson Memorial Bridge.*



—Photo courtesy of Rick Lamb and Ron Robertson, MoDOT
■ *View of the bridge from the Illinois approach spans.*

then establish communication with the CRS to stream data out using standard internet communication protocols. Overall, once deployed, the instrumentation scheme will provide extensive strong-motion response recording capability to facilitate different types of studies and to assess the performance of the bridge during strong-motion events.

Data obtained from the instrumentation will help designers and researchers better understand the behavior and performance of large, cable-supported bridges under both weak and strong ground motion, and improve their ability to design more resilient structures in the future. The data will also assist the bridge owners in maintaining and inspecting the structure following a moderate to large earthquake, thus helping to ensure public safety.❖

—Submitted by Gokhan Pekcan, University of Nevada, Reno

FHWA forms Highway Bridge Seismic Engineering Virtual Team

A new initiative to advance seismic technology and practice for highway and transportation infrastructure, called the FHWA Seismic Engineering Virtual Team, is underway. Begun under the auspices of the Federal Highway Administration (FHWA), the Virtual Team, or V-Team, was formed to develop and lead a national agenda on bridge seismic technology. The V-team will

serve in partnership with AASHTO and the State Departments of Transportation (DOTs), to provide a reliable and credible source of information on seismic issues. The group held its first meeting at the FHWA's Turner Fairbanks Highway Research Center in McLean, Virginia, on January 17, 2002.

W. Phillip Yen and Benjamin Tang, both of the FHWA, are the organizers of the

V-team. Other members include FHWA bridge engineers, State DOT bridge engineers, researchers of the three national earthquake engineering centers (MCEER, MAE and PEER), and private practitioners. V-Team activities and initiatives will be reported on a soon-to-be-created web site, that will be maintained by the FHWA.❖

Highway Project 094 HSRC Meets to Review Progress

The MCEER Project 094 Highway Seismic Research Council (HSRC) met in Chicago, Illinois, on November 27 and 28, 2001. During the meeting, the HSRC reviewed progress made under the FHWA-sponsored research program "Seismic Vulnerability of the Highway System," which is a six-year, \$10.8 million program of research focused on new approaches and technologies for improving the seismic performance of the U.S. national highway system. The HSRC also discussed plans for future research within the program with the project Research Committee, issues regarding research coordination with other agencies, and information dissemination and outreach.

MCEER Highway Project 094 has four major areas of research: Loss Estimation Methods for Highway Systems; Seismic Design and Retrofitting of Major Bridges; Advanced Technologies for Earthquake Protective Systems; and Ground Motion and Geotechnical Studies for Major Bridges. The project is also conducting a series of special studies and technology transfer initiatives, including

research on non-destructive evaluation of seismically-retrofitted bridges; support studies for implementing the new bridge LRFD seismic design specifications prepared under a joint MCEER/Applied Technology Council project; and the conduct of a number of national and international conferences, seminars, and workshops. Research task statements for the project are posted on MCEER's web site at <http://mceer.buffalo.edu/research/HighwayPrj/default.asp>.

As a special event during the meeting, HSRC member Bojidar Yanev, Director of the Bridge Management and Inspection Bureau for the New York City Department of Transportation, made a presentation on the events and building damage that occurred during the terrorist attacks on the World Trade Center complex on September 11, 2001. Dr. Yanev's office was in the perimeter of the primary damage zone from the attack, and he was able to photograph the sequence of events and collapse of both buildings from very close to Ground Zero. ❖

Update on NEES Activities



Michel Bruneau organized a session on the Network for Earthquake Engineering Simulation (NEES) during the annual Transportation Research Board (TRB) meeting. Titled "New Experimental Capabilities for Bridge Seismic Research: George E. Brown, Jr., Network for Earthquake Engineering Simulation," the session featured presentations from several MCEER affiliates on progress at their respective institutions on NEES efforts.

The objective of the session was to present, to bridge engineers, an overview of how the new NEES facilities can enhance the

level of earthquake engineering research for bridges and make it possible to find solutions for problems that could not previously be solved. Presenters included Michel Bruneau, University at Buffalo laboratory, Tarek Abdoun, Rensselaer Polytechnic Institute centrifuge facility, and Ian G. Buckle, University of Nevada, Reno laboratory. Dr. Joy Pauschke, NEES program director, opened the session by providing an overview of the overall direction of the NEES program.

The Transportation Research Board's 81st Annual Meeting attracted over 8,000 transportation professionals from around the world. The meeting was held in Washington D.C. on January 13-17, 2002. ❖

MCEER Participates in Advisory Committee



MCEER has been invited to participate in the Regional Advisory Committee (RAC) for the Northeast Region of the Advanced National Seismic System, (ANSS-NE). The RAC is charged with overseeing the relationship between regional stakeholders and the operators of the ANSS, and with developing the principles that govern the implementation of the ANSS-NE.

Membership will be drawn from several stakeholder communities including academia, engineering practice, emergency management and public service agencies. Regional co-coordinators are John Ebel, of the Weston Observatory, Boston College and Arthur Lerner-Lam of Lamont Doherty Earth Observatory, Columbia University.

The ANSS is a program of the US Geological Survey (USGS) that aims to enhance the capabilities of regional seismic networks to reduce vulnerabilities to earthquakes and strengthen regional earthquake hazard mitigation. Within ANSS, specific program elements are charged with developing ties to regional engineering and emergency response professionals and developing products and services relevant to earthquake hazard mitigation.

The RAC is part of the management structure designed by the USGS to provide advice on these program elements. The RAC will also advise on the principles governing the implementation plan for the ANSS-NE. For more information, consult the ANSS web site at: <http://www.anss.org> or contact John Ebel (e-mail: ebel@bc.edu); or Art Lerner-Lam (e-mail: lerner@ldeo.columbia.edu). ❖

Team of Researchers Developing Automated Systems for Improving Post-Disaster Emergency Response

Minutes after the first hijacked plane hit the World Trade Center's north tower on September 11, information began to flow from the site to police, firefighters and other emergency personnel. The situation and information flow became more complex when a second plane flew into the WTC's south tower, and even more complicated when both towers subsequently collapsed.

This same type of communication "overload" happens during and immediately after natural disasters and other situations where many pieces of information are arriving in a short period of time from a multiplicity of sources. Decisions of-

ten need to be made on the basis of this information, which at times may be conflicting.

MCEER is part of a team, led by the University at Buffalo's Center for Multisource Information Fusion, that is developing software tools to fuse the many channels of information that begin flowing following a major disaster. MCEER's role is to provide actual data from the Northridge, California earthquake, augmented by expert opinion from the minutes, hours, days and weeks after the event. This data will then be "fused" and embedded in an urban emergency management and crisis management system.

The work is funded by a five-year, \$2.5 million grant awarded by the Air Force Office of Scientific Research to the Calspan-UB Research Center (CUBRC). Other partners include the University of Virginia at Charlottesville, Veridian Corp., Alphatech, Inc., Orincon Corp. and IET, Inc.

The principal investigator is Professor James Llinas, UB research professor of industrial engineering and director of the Center for Multisource Information Fusion. George Lee coordinates MCEER's task. Other members of the MCEER team include Ronald Eguchi, ImageCat, Inc., Kathleen Tierney, Disaster Research Center, University of Delaware, Mai Tong, University at Buffalo and Dorothy Tao, MCEER Information Service. ❖

Call for Abstracts

International Conference on Advances and New Challenges in Earthquake Engineering Research

The International Conference on Advances and New Challenges in Earthquake Engineering Research, sponsored by ANCER (see page 1), will be held August 15-20, 2002. The Conference will consist of two consecutive back-to-back meetings in Harbin and Hong Kong, China. The Harbin component of the meeting, hosted by the Institute of Engineering Mechanics of China Seismological Bureau (IEM, CSB) on August 15-17, will focus on new phenomena of earthquake engineering and innovative solution approaches. The Hong Kong meeting component, hosted by Hong Kong Polytechnic University (HK Poly U) on August 19-20, will emphasize problems in areas of moderate seismicity and intelligent infrastructure engineering. Any research in the development and application of advanced technologies will be the common underpinning of both meetings.

Authors are invited to submit 200-300 word abstracts to the organizing committee (see complete submittal information below) where they prefer to present the paper. However, the final decision as to where a paper is presented will be left to the International Advisory Committee. Authors are strongly encouraged to participate in both conferences. The official language of the conference for both oral and written presentations is English.

Abstracts are due March 31, 2002, and the full-length paper is due at the beginning of the conference. Two separate proceedings and session reports will be published after the conference. Extended abstracts and available full-length papers will be distributed at the conference.

Harbin Conference

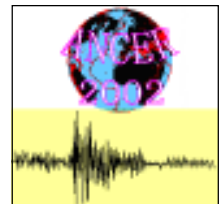
The three-day international conference in Harbin will focus on advances and

new challenges in earthquake engineering, emphasizing experiences and lessons learned from recent de-

structive earthquakes, and trends in earthquake engineering. Special features include: the first annual meeting of the Asian-Pacific Network of Centers for Earthquake Engineering Research (ANCER) (see page 1), and a tribute to the 90th anniversary of the birth of the late Professor Liu Huixian, founder of Chinese earthquake engineering and a well-known expert throughout the world.

The Harbin conference welcomes papers on the following main themes:

- Damage in recent earthquakes



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International Conference

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- Earthquake observation and data processing
- Strong ground motion
- Dynamic properties and response of soil
- Soil-structure interaction
- Structural analysis and design
- Lifeline systems
- Seismic codes and standards
- Seismic risk mitigation

Sponsors include the China Seismological Bureau (CSB), Asian-Pacific Network of Centers for Earthquake Engineering Research (ANCER), The Ministry of Science and Technology of China (MOST, China), National Natural Science Foundation of China (NNSF, China), and The Ministry of Construction of China (MOC, China). The organizing committee members are Xiaozhai Qi, chairman; Xing Jin and Jianfa Huang, vice-chairmen; Jie Cui, Zhiqiu Wang and Ming Zhao, secretary general; and Junqi Lin, Xun Guo, Xuelan Zhang and Xingmin Hou, members.

Abstracts for the Harbin conference should be submitted to: Professor Xiaozhai Qi, Director, Institute of Engineering Mechanics, China Seismological Bureau, 9 Xufu Road, Harbin 150080, China, phone: (86) (451) 665-2625; fax: (86) (451) 666-4755; e-mail: qxz@iem.net.cn or qxz@public.hr.hl.cn.

Hong Kong Conference

The two-day conference in Hong Kong will follow the Harbin conference and focus on advances in and issues on earthquake engineering with special emphasis on problems in regions of moderate seismicity. Emphasis will be given to the application of emerging technologies and new design philosophies and methodologies to address

recent challenges in earthquake engineering and hazard mitigation, and to examine new opportunities on the basis of Asia-Pacific regional and global cooperation.

The Hong Kong Conference welcomes papers on the following main themes:

- Evaluation of moderate seismic hazards
- Slope stability and landslide prevention
- Structural control technology
- Smart materials and smart structures
- Health monitoring, damage detection, and structural integrity evaluation
- Real-time global positioning and information systems
- Automated condition and safety appraisal methods
- Innovative methods for engineering renewal
- Integrated design methods against earthquakes and typhoons
- Implementation of performance-based design and engineering methods

Sponsors include the Asian-Pacific Network of Centers for Earthquake Engineering Research (ANCER), Hong Kong Institute of Engineers (HKIE), and the Works Bureau, Hong Kong SAR Government (WB). The organizing committee members are J.M. Ko, chairman; Y.L. Xu, vice-chairman; E.S.S. Lam, secretary general; and K.T. Chau, Y.L. Wong, Y.Q. Ni, H.J. Pam, C.C. Chang and Q.S. Li, members.

Abstracts for the Hong Kong event should be submitted to Professor Jan-Ming Ko, Faculty of Construction and Land Use, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong, phone: (852) 2766 5037; fax: (852) 2362 2574; e-mail: cejmko@polyu.edu.hk.

Registration Information

The registration fee is \$200 (US) for the Harbin Conference, and includes a banquet, three lunches, coffee breaks, and proceedings of the Harbin Conference. The fee is \$150 (US) for the Hong Kong Conference, which includes a banquet, two lunches, coffee breaks, and proceedings of the Hong Kong Conference.

Additional information on the conference can be found on MCEER's web site at <http://mceer.buffalo.edu>. ♦

ASIAN-PACIFIC CENTERS

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Japan and Dr. C-H Loh, National Center for Research on Earthquake Engineering (NCREE), National Taiwan University, Taipei, Taiwan.

ANCER plans to expand its membership during and after the conference. ANCER is headquartered at KEERC, <http://www.keerc.net>. ♦

Asian-Pacific Centers Network Member Web Sites

Disaster Prevention Research Institute (DPRI)

<http://www.dpri.kyoto-u.ac.jp/default.html>

Institute of Engineering Mechanics, China Seismological Bureau (IEMCSB)

<http://www.iem.net.cn/english/indexe.htm>

Korean Earthquake Engineering Research Center (KEERC)

<http://keerc.snu.ac.kr/keerc.html>

Mid America Earthquake Center (MAE)

<http://mae.ce.uiuc.edu>

Multidisciplinary Center for Earthquake Engineering Research (MCEER)

<http://mceer.buffalo.edu>

National Center for Research on Earthquake Engineering (NCREE)

<http://www.ncree.gov.tw>

Pacific Earthquake Engineering Research (PEER) Center

<http://peer.berkeley.edu>

Update on NYCEM Activities

The New York City-area Consortium for Earthquake-loss Mitigation (NYCEM) project moves into its third and final year, striving to complete a series of regional scenario studies which will produce earthquake loss estimations for the greater New York-New Jersey area. Work at Lamont-Doherty Earth Observatory will focus on the development of more exact soil classifications for the area, to improve upon existing default soil categorizations within HAZUS. Work at Princeton University will complete HAZUS scenario executions for the area below 59th Street in Manhattan, the entire island of Manhattan and initial attempts for all five boroughs of the city. The latter effort may be somewhat impacted by limitations of the existing building data for the Bronx, Queens, Brooklyn and Staten Island. Loss estimations will also be broadly carried out for the 31-county tri-state region, but will be

heavily dependent on the availability of detailed soil and building stock data. A primary emphasis in the final year of the project will be to work with consortium members to encourage contributions of important data sources which are essential to refining final loss estimations.

Additional outreach activities will be planned to extend results of the study to those in practice and the public sector. It is anticipated that one outcome of the project will be a report detailing the methodologies and approaches which have been used in the study, in order to assist other large urban areas in the use of HAZUS and similar loss estimation models. An additional report is planned to describe and rank vulnerabilities of existing critical facilities in Manhattan. Data and reports will be posted to the NYCEM web site as they are developed (see <http://www.nycem.org>).❖

NSF/MCEER Seek Applicants for Summer Research Projects

MCEER is recruiting applicants for NSF's Research Experiences for Undergraduates (REU) program. The program, in its third year at MCEER, involves undergraduate students in Center research activities through summer internships. Fellow earthquake Centers MAE (Mid-America Earthquake Center) and PEER (Pacific Earthquake Engineering Center) also participate in the program.

Pending confirmation of funding, eight applicants will be selected at each Center and will receive a \$5,000 stipend. Additional details and requirements can be found on our web site at <http://mceer.buffalo.edu/education/reu/default.asp>

or by contacting Andrea Dargush at dargush@acsu.buffalo.edu. The deadline for applications is March 18, 2002.



In previous years, MCEER's REU students have been involved in a variety of different projects, including seismic design and testing, public sector approaches to mitigation, risk and reliability in seismic design, seismic hazard characterization of the New York City area, application of remote sensing technologies for earthquake recovery, and performance of soils under earthquake-induced deformation.❖

Revised Report on Analysis and Design of Buildings with Passive Energy Dissipation Systems

Development and Evaluation of Simplified Procedures for Analysis and Design of Buildings with Passive Energy Dissipation Systems was first published on December 8, 2000, as report number MCEER-00-0010, by Oscar Ramirez, Michael Constantinou, Charles Kircher, Andrew Whittaker, Martin Johnson and Juan Gomez. In September of 2001, Dr. Christis Chrysostomou, of the Higher Technical Institute of Cyprus, independently re-worked the examples and checked the validity of the presented results. His work resulted in a substantial volume of changes and corrections that necessitated the release of a revised version of the report. The new report, published as MCEER-00-0010, Revision 01, with the same title, includes Dr. Chrysostomou as an author. It is available through MCEER Publications for \$40.00.

The work presented in this report was performed under the auspices of Technical Subcommittee 12, Base Isolation and Energy Dissipation, of the Building Seismic Safety Council, which was charged with developing analysis and design procedures for inclusion in the year 2000 *NEHRP Recommended Provisions for Seismic Regulations for New Buildings and Other Structures*. The work of Technical Subcommittee 12 was supported by the Federal Emergency Management Agency.❖

Update on SLC Activities

The tragic events of September 11 affected, besides many major things, the activities of MCEER's Student Leadership Council (SLC). A few SLC members were preparing to attend the Student Retreat as part of the Engineering Research Centers (ERC) Annual Meeting organized by the National Science Foundation (NSF). This meeting was scheduled to take place in Washington D.C. this past November, however it was canceled as a safety precaution.



■ Attendees at the Tri-Lateral SLC meeting pose for a group picture.

In the meantime, the MCEER SLC is working on developing its student web page. Besides containing information about the SLC organization, members and activities, the web page will serve as a useful tool where students will be able to post resumes, get information on ongoing research projects, and have easy access to valuable resources on earthquake engineering.

MCEER's SLC members reflect the multidisciplinary nature of the center. The academic departments represented by our members range from sociology to energy, environmental & mineral economics, to various majors in earthquake engineering such as geotechnical and structural engineering. The research ar-

reas are thus diverse; political engineering of disaster mitigation legislation, passive site remediation for mitigation of liquefaction risk, performance based design, seismic energy dissipation and isolation systems – to name a few. All of these topics eventually contribute to MCEER's ultimate goal to enhance the seismic resiliency of communities. MCEER SLC students take great pride in serving this honorable cause. We invite you to take a glance at the *Bulletin's* 'Student Spotlight' column, which features a different student each issue.

Last but not least, four MCEER SLC students, Rory Connell (University of Delaware), Ani Natali Sigaher, Gordon Warn, and Jeffrey Berman (University at Buffalo) attended the 2002 EERI Annual Meeting in Long Beach, California, from February 6-9, thanks to support from MCEER. The group attended several sessions of lectures on multidisciplinary earthquake topics regarding historical and state-of-the-art perspectives, including the presentation by the 2002 EERI Distinguished Lecturer Dr. Mete Sözen (Purdue University). On a side note, Dr. Mete Sözen has agreed to speak at the University at Buffalo on April 5th, as part of the ongoing UB-MCEER-EERI seminar series. As usual, this seminar will be webcast live as well as archived for future viewing.

The students also represented MCEER SLC at the tri-lateral SLC meeting, which brings together students and education coordinators from MCEER, MAE, and PEER--the three Earthquake Engineering Research Centers (EERC). Each SLC presented a summary of their activities in the past year and their plans for the upcoming year. The SLC's took advantage of this opportunity to make plans for



■ MCEER SLC members Jeffrey Berman, Gordon Warn, A. Natali Sigaher and Rory Connell attended the 2002 EERI Annual Meeting.

some collaborative projects, including a tri-lateral mentoring program in which current SLC members would consult with undergraduate students at all the EERC universities, to assist and inform them of the opportunities available within each EERC. Plans were also made to set up video conferencing and chat conferencing between the SLC chairs. This will assist in getting tri-lateral projects off the ground. Students concluded the meeting by surprising Ms. Gina Ring (the education coordinator of PEER) with a good-bye cake. Gina has accepted a new position within University of California at Irvine.

The four MCEER SLC students were very glad to participate in the unique opportunity to network with industry professionals, members of the academic community, and other student colleagues. They sincerely thank MCEER, especially Ms. Andrea Dargush, for the opportunity to attend this event and look forward to participating in similar meetings in the future.❖

—Submitted by A. Natali Sigaher and Jeffrey W. Berman, University at Buffalo

Student Spotlight

James A. Mason is a Ph.D. candidate in the Department of Civil and Environmental Engineering at Cornell University. His advisor is Professor Thomas O'Rourke. James came to Cornell from

Caltrans in 1996 after utilizing work by Professors O'Rourke and Hamada (of Waseda University, Japan) in the retrofit of a long span bridge. The bridge was completely founded in liquefiable soils in northern California, two miles from the San Andreas fault. This brought him into contact with the Cornell engineering community, and motivated his journey to Ithaca. He came to Cornell with over 15 years experience as a civil and structural engineer, and expects to graduate in the summer of 2002.

His research focuses on developing and verifying the retrofit techniques and materials used to strengthen the city of Los Angeles water system.

Entitled "Earthquake Response and Seismic Strengthening of Welded Steel Pipelines," the project has directly included private industry. First, three companies donated time and materials to the project: Master Builders, Fyfe Co., and RJ Watson, Inc. Then, all of the large diameter pipe testing was performed at facilities located at Taylor Devices, Inc., a flagship member of MCEER's Strategic Partnerships Network, with a donation of time and staff. Some testing was performed at Cornell, but more capacity was needed, which was available at Taylor Devices. Finally, the Los Angeles Department of Water and Power (LADWP) donated all of the pipe specimens to the project, including shipping costs.

When asked how he became interested in earthquake engineering, James said, "I have been interested in bridges and historic structures (especially the California missions) since I was a young man. I have been intrigued by the seismic performance of these structures over time. And, as for the engineering aspect, my father is a civil and structural engineer with his own company. I worked for him designing small bridges, subdivisions, and doing survey work. My passion for earthquake engineering was really motivated while I worked for Caltrans. This is when I realized that earthquake engineering must be performed as a complete system, i.e., the integration of the substructure (foundation) with the superstructure (bridge or building). I utilized this methodology for the retrofit of a 32-span bridge near Berkeley, one mile from the Hayward fault. Also, working on the retrofit design for the San Francisco-Oakland Bay Bridge brought home all of the seismic concepts that I had been working on."

After graduation, James will be working with a consortium of other consulting engineers through his company, Integrated Structural Earthquake Engineering (iSEE). James said, "I will work on bridges and historic structures and pipeline design for both static and dynamic loading conditions. I am also bringing a technology developed by Dr. Fernando Lizzi (Naples, Italy) for the retrofit of non-reinforced masonry and stone bridges and buildings to the U.S., the Internal Reinforced Method (IRM). This work integrates the geotechnical and structural retrofit of structures with a technology that I have been utilizing and investigating for approximately ten years."

When not busy with his studies, James enjoys hiking, skiing, canoeing and kayaking with his wife, Stephanie and 13 year-old son, Sam. ❖



■ James Mason (second from right) describes his research to members of MCEER's Strategic Partnerships Network.

MCEER Workshop: Lessons from the World Trade Center Terrorist Attack *Management of Complex Civil Emergencies and Terrorism-Resistant Civil Engineering Design*

MCEER, in collaboration with the National Academy of Sciences (NAS) and the Institute for Civil Infrastructure Systems (ICIS), is organizing a workshop entitled *Lessons from the World Trade Center Terrorist Attack: Management*

of Complex Civil Emergencies and Terrorism-Resistant Civil Engineering Design. The workshop is tentatively planned for June 24-25, 2002 in New York City. About 40 experts from academia and industry will be invited to participate. Attendance

will be open to all interested, however, space is limited and preferred registration will be given to those invited by MCEER, NAS and ICIS. More information will be posted on our web site as details become available. ❖

UB-MCEER-EERI Seminar Series at the University at Buffalo

The EERI student chapter of the University at Buffalo (UB-EERI), the MCEER Student Leadership Council, the Networking and Education Programs of MCEER, and the University at Buffalo's Department of Civil, Structural and Environmental Engineering jointly sponsor a series of seminars on a variety of topics related to earthquake hazard mitigation. The purpose of the seminar series is to widen accessibility to timely, technical presentations by students, researchers, visitors and affiliates of MCEER. The seminars are broadcast over the Internet in real-time, and can be viewed anytime at <http://civil.eng.buffalo.edu/webcast>. UB's Professor Andrei Reinhorn and undergraduate student Jason Hanley, from Computer Science and Engineering, arrange the webcasts.

Frequency Domain Analysis of Long-Span Bridges Subjected to Non-Uniform Seismic Motion

Mohammed Ettouney, Weidlinger Associates, Inc.

Dr. Mohammed Ettouney, Weidlinger Associates, Inc., gave a seminar entitled "Frequency Domain Analysis of Long-Span Bridges Subjected to Non-Uniform Seismic Motion," at the University at Buffalo on Friday, November 30, 2001. His presentation was included as the sixth in the ongoing seminar series at UB on earthquake engineering topics. The MCEER Information Service prepared handouts with references related to the topic of Dr. Ettouney's presentation.

Ms. Ani Natali Sigaher, Ph.D. candidate in the Department of Civil, Structural and Environmental Engineering and the president of the MCEER Student Leadership Council, opened the seminar by welcoming the audience of about 35 people, and introducing the speaker.

Dr. Ettouney started by giving an introduction to the topic of his presentation. He noted, in particular, three identified reasons for non-uniformity of seismic motion that affect the seismic behavior of long-span bridges. They are: local soil conditions, wave passage and incoherency effects, while other effects, such as extended source and attenuation, are relatively small. He discussed the importance of non-uniform seismic motions, especially for sensitive and important structures and how it has led to the development of several methods of



■ Faculty and students from UB's Department of Civil, Structural and Environmental Engineering enjoyed a luncheon with Dr. Ettouney prior to his seminar presentation.

analysis. These methods can be subdivided into two general categories, deterministic and stochastic. Due to the inherent uncertainty of the non-uniform seismic motions, deterministic methods, mainly time integration methods, can be computationally inefficient while stochastic methods are generally very efficient. The stochastic methods have been based mainly on modal analysis methods where the input/output are either described in terms of power spectral density or response spectra.

Dr. Ettouney then elaborated on a direct frequency domain method that is based on formulating the whole soil-structure problem and showed its applications to non-uniform seismic support motions on a simple two-dimensional bridge and a long-span suspension bridge. The results

indicate that non-uniform support motions may result in a large shifting of resonant frequencies of the structure. Also, a large redistribution of bridge responses and internal forces was observed when the results for non-uniform and uniform seismic motion, respectively, were compared.

Dr. Ettouney's presentation was received by generous applause, after which Ms. Sigaher moderated the discussions. A number of interesting questions were posed from the audience.

—Submitted by Benedikt Halldorsson,
UB-EERI secretary

Incorporating Effects of Near Fault Tectonic Deformation into Design Ground Motions

Norman Abrahamson, Pacific Gas and Electric Company

The University at Buffalo Earthquake Engineering Research Institute Student Chapter (UB-EERI) invited seismologist Dr. Norman Abrahamson of the Pacific Gas and Electric Company, California, to give a presentation as part of its ongoing seminar series. His presentation, "Incorporating Effects of Near

(Continued on page 10)

Abrahamson Seminar

(Continued from page 9)

Fault Tectonic Deformation into Design Ground Motions," was held on October 26, 2001. His visit was sponsored by the Friedman Family Visiting Professionals Program of the EERI, whose purpose is, among others, to enhance the understanding of the multidisciplinary nature of earthquake engineering.

The event began with Darren Vian, UB-EERI president for 2001-2002, opening the seminar by welcoming attendants (over 35 people) to the seminar and providing a brief introduction of the purpose of the seminar series and its sponsors. Subsequently, Benedikt Halldorsson, the UB-EERI secretary for 2001-2002 and past president, introduced the speaker with a few background remarks.

Dr. Abrahamson started with an introduction of two near fault effects on long period ground motions: directivity and fling, explaining how both effects result in large velocity pulses in the near fault ground motion while having very different causes. He showed examples of fling effects observed in recent earthquakes e.g., the 1999 Turkey and Taiwan earthquakes.

He emphasized that existing ground motion attenuation relations do not include fling effects – a separate ground motion model needs to be developed for this phenomena. The total ground motion would then be computed by combining the ground motion from attenuation relations with the ground motion from the fling.

Subsequently, he introduced a preliminary model based on a single sine-wave cycle to model the fling in acceleration. He explained the parameters needed for the model and presented preliminary estimates of these parameters based on



■ *Dr. Norman Abrahamson discussed a new method to develop design ground motions that incorporates fling effects.*

existing data. He then went on to show an example of the application of the method for a magnitude 7.2 strike-slip earthquake at a distance of 5 km.

Finally, Dr. Abrahamson gave a summary of the presentation and posed a question regarding if fling has a significant effect on the response of structures. Incorporating fling into the ground motion adds complexity to the development of the ground motion. It has not yet been determined which classes of structures are affected by fling, thus justifying this additional complexity.

Dr. Abrahamson's presentation was received by generous applause, after which the UB-EERI secretary moderated discussions. A number of interesting questions were posed from the active audience, the vast majority of which were engineers.

As with all of the seminars in this series, Dr. Abrahamson's presentation was webcast in real time, and archived for later viewing. In particular, webcasting Dr. Abrahamson's presentation made it possible for *other* EERI student chapters to benefit from the Friedman Family Visiting Professional Program. ❖

—Submitted by Benedikt Halldorsson,
UB-EERI Secretary

Recent Events...

October 1, 2001 – January 31, 2002

October 1 and 11, 2001

Seminar by Michel Bruneau, Andrei Reinhorn and Andrew Whittaker
Structural Engineering
Reconnaissance at Ground Zero
Buffalo, New York

October 13, 2001

Earth Science Day
Buffalo, New York

October 26, 2001

Seminar by Norman Abrahamson
Incorporating Effects of Near Fault
Tectonic Deformation into Design
Ground Motions
Buffalo, New York
Webcast address:
<http://civil.eng.buffalo.edu/webcast>

November 12, 2001

World Trade Center Forum
Columbia University
New York City, New York

November 27-28, 2001

Highway Seismic Research Council
Meeting
Chicago, Illinois

November 30, 2001

Seminar by Mohammed Ettouney
Frequency Domain Analysis of
Long-Span Bridges Subjected to
Non-Uniform Seismic Motion
Buffalo, New York
Webcast address:
<http://civil.eng.buffalo.edu/webcast>

December 12-13, 2001

World Trade Center Grantees Workshop
New York City, New York

January 22-24, 2002

Urban Hazards Forum
New York City, New York

January 29, 2002

New York City Area Consortium for
Earthquake Loss Mitigation (NYCEM)
Meeting
New York City, New York

New MCEER Technical Reports

MCEER technical reports are published to communicate specific research data and project results. Reports are written by MCEER-funded researchers, and provide information on a variety of fields of interest in earthquake engineering. The proceedings from conferences and workshops sponsored by MCEER are also published in this series.

MCEER's web site offers a complete list of technical reports, abstracts, and prices. The publications catalog allows users to search the report list by subject, title and author, and to place orders for these reports. Visit the site at <http://mceer.buffalo.edu/publications/default.asp>.

Overcoming Obstacles to Implementing Earthquake Hazard Mitigation Policies: Stage 1 Report

by D.J. Alesch and W.J. Petak, 12/17/01, MCEER-01-0004, 108 pages, \$25.00

This is the first of three reports to be published resulting from a project on overcoming obstacles to implementing earthquake hazard mitigation policies. The project aims to bridge the three planes, from basic research, through enabling processes, to engineered systems. This report presents the results of an extensive literature review about implementation and decision-making from across the spectrum of social and behavioral sciences, drawing primarily

on empirical scholarly research findings. The review resulted in four products: definitional issues and concerns, organizational requirements for implementation, the implementation network, and propositions concerning impediments to implementation. Each of these products is discussed in the report.

Updating Real-Time Earthquake Loss Estimates: Methods, Problems and Insights

by Craig E. Taylor, Stephanie E. Chang and Ronald T. Eguchi, 12/17/01, MCEER-01-0005, 66 pages, \$25.00

This project re-examined earthquake loss estimation methods by using data collected after the 1994 Northridge

earthquake from the California Governor's Office of Emergency Services (OES) and the California Department of Insurance (CDI). In this report, the results of an effort to develop a method for applying Gallup-like statistical procedures to rapidly update earthquake loss estimates are summarized.

First, some of the insights gained from an examination of election polling techniques are outlined. Next, the California Governor's Office of Emergency Services (OES) and California Department of Insurance (CDI) loss data are shown to provide an opportunity and motive to develop a rapid loss updating method. At the same time, the diversity of criteria for determining losses underscores the complexity of any updating and, more generally, any loss estimation method. Third, a Bayesian method for rapidly updating losses is outlined. This method is next tested based on a 1995 CDI loss database developed midway before a more finalized 1996 CDI loss summary became available. Further, by examining the Northridge earthquake loss data, the possibility of employing stratification techniques to improve the efficiency of updating methods is explored. Finally, lessons learned and research needs developed from this project are summarized.

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Upcoming Events

April 28 – May 1, 2002

**Third National Seismic Conference and Workshop on Bridges and Highways:
Advances in Engineering Technology for the Seismic Safety of Bridges in the New
Millennium ■ Portland, Oregon**

Sponsored by: Federal Highway Administration ■ Oregon Department of Transportation
■ Washington State Department of Transportation

Organized by: MCEER

Contact: Michael S. Higgins, P.E., Pure Technologies U.S. Inc., 10015 Old Columbia
Road, Suite B-215, Columbia, MD 21046 ■ Phone: (800) 537-2806

■ Fax: (410) 309-7051 ■ E-mail: mike.higgins@soundprint.com

Web Site: <http://mceer.buffalo.edu/meetings/3nsc/default.asp>

May 30-31, 2002

**ATC-17-2 Seminar on Response Modification Technologies for Performance-Based
Seismic Engineering ■ Los Angeles, California**

Sponsored by: Applied Technology Council ■ MCEER

Contact: ATC-17-2 Project, Applied Technology Council, 555 Twin Dolphin Drive,
Suite 550, Redwood City, California ■ Phone: (650) 595-1542 ■ Fax: (650) 593-2320

■ E-mail: atc@atcouncil.org

Web Sites: http://mceer.buffalo.edu/meetings/atc_17_2.asp and <http://www.atcouncil.org/index.htm>

July 21 – 25, 2002

7th U.S. National Conference on Earthquake Engineering: Urban Earthquake Hazard

■ Park Plaza Hotel ■ Boston, Massachusetts

Sponsor: Earthquake Engineering Research Institute

Organizing Committee: MCEER

Contact: Andrea Dargush, MCEER ■ Phone: (716) 645-3391 ext. 106 ■ Fax: (716) 645-3399

■ E-mail: dargush@acsu.buffalo.edu

Web Sites: http://mceer.buffalo.edu/meetings/USNCEE_2002.asp and <http://www.eeri.org>



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