



**MONDAY, June 29, 2009**

8:00am - 9:15am

*Jewett Ballroom*

**PLENARY SESSION (P-MON-1) - LIFELINE PERFORMANCE UNDER EXTREME EVENTS**

**Speaker - Thomas O'Rourke, M.ASCE, Ph.D.**

*Thomas R. Briggs Professor of Engineering, School of Civil and Environmental Engineering, Cornell University, Ithaca NY*

This presentation will explore the behavior of lifelines under extreme natural events and human threats. Major lessons learned over the past decade will be summarized with respect to lifeline component and system performance, focusing on how the Los Angeles earthquakes, the World Trade Center Disaster, and Hurricane Katrina affected various lifeline systems, including water distribution, electric power, oil and gas delivery, transportation, and telecommunications. The concept of critical infrastructure will be discussed, including its definition according to the U.S. National Infrastructure Protection Plan. Lifeline interdependencies will be explored, and illustrated with examples from recent extreme events. Key lessons learned with respect to community resilience will be summarized in light of recent disasters, and recommendations for improving both lifeline system and community response to extreme events will be given.

9:45am - 11:15am

*Concurrent Breakout Sessions*

**Session 1-MON-R1 – OCC 201**

**ELECTRIC POWER SESSION 1 - EQUIPMENT**

High-voltage substation equipment has exhibited the most severe seismic vulnerability. Assessing equipment and their components can improve new designs and retrofitting can improve existing facilities. This session discusses tests of porcelain and hollow-core composite insulators, assesses the fragility of a current transformer, the protection of a disconnect switch, and retrofitting substation equipment.

**Moderator:** Anshel Schiff, Ph.D., *Precision Measurement Instruments*

≈ **Evaluation of Composite Post Insulators**

GianPaolo Cimellaro, Andrei Reinhorn, *University at Buffalo*; Anshel Schiff, Ph.D., *Precision Measurement Instruments*

≈ **Breaking Strength of Porcelain Insulator Sections Subjected to Cyclic Loading**

Shakhzod Takhriov, Ph.D., P.E., *Earthquake Engineering Research Center*; Eric Fujisaki, P.E., *Pacific Gas and Electric Company*; Leon Kempner, P.E., Ph.D., M.ASCE, *Bonneville Power Administration*; Anshel Schiff, Ph.D., *Stanford University*

≈ **Seismic Evaluation and Protection of High Voltage Disconnect Switches**

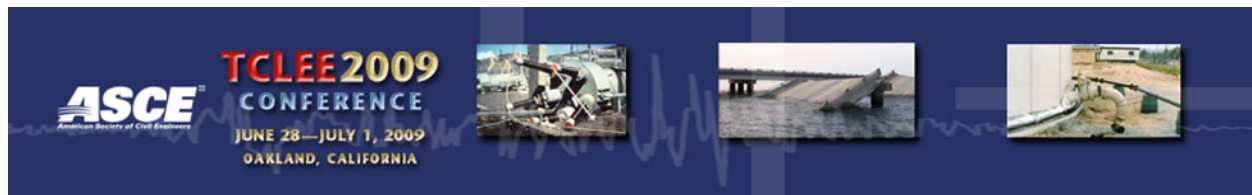
Dohwan Kong, Andrei Reinhorn, *University at Buffalo*

≈ **Seismic Vulnerabilities and Retrofit of High-Voltage Electrical Substation Facilities**

Brian Knight, SE, MS, *Miyamoto International Inc.*; Leon Kempner, P.E., Ph.D., M.ASCE, *Bonneville Power Administration*

≈ **Development of a Damage Estimation System for Electric Power Distribution Equipment Using Bayesian Network**

Yoshiharu Shumuta, *CRIEPI*; Tatsuhiro Matsumoto, *Sakurai Eng.*; Kengo Takahashi, *DCC*



**MONDAY, June 29, 2009 - continued**

9:45am - 11:15am *Concurrent Breakout Sessions*

**Session 1-MON-R2 – OCC 202**

**PORT SESSION 1 - SEISMIC RISK MANAGEMENT FOR PORT SYSTEMS**

This session presents the results of research under a NEESR Grand Challenge project that is integrating geotechnical and structural earthquake engineering, port logistics, and risk and decision analysis to enable comprehensive seismic risk analyses for container ports that includes losses due to property damage and business interruption.

**Moderators:** Glenn Riz, Ph.D., *Georgia Institute of Technology*  
Erik Soderberg, S.E., *Liftech Consultants Inc*

- ≈ **Improving the Seismic Performance of Pile-to-Wharf Connections**  
Dawn Lehman, Ph.D., Charles Roeder, Ph.D., P.E., *University of Washington*
- ≈ **Analysis and Testing of Container Cranes Under Earthquake Loads**  
Reginald DesRoches, Ph.D., Roberto Leon, Ph.D., P.E., Laura Jacobs, Ben Kosbab, Lynne Schleiffarth, *Georgia Institute of Technology*
- ≈ **Seismic Risk Management for Container Ports**  
Glenn Riz, Ph.D., Lindsay Burden, MSCE, *Georgia Institute of Technology*; Stuart D. Werner, Ph.D., *Seismic Systems & Engineering Consultants*
- ≈ **Fragility Models for Container Cargo Wharves**  
Stuart D. Werner, Ph.D., *Seismic Systems & Engineering Consultants*; Reginald DesRoches, Ph.D., Glenn Riz, Ph.D., Abdollah Shafieezadeh, *Georgia Institute of Technology*
- ≈ **Seismic Response of Pile-Supported Container Wharves**  
Reginald DesRoches, Ph.D., Glenn Riz, Ph.D., Abdollah Shafieezadeh, *Georgia Institute of Technology*; Stuart D. Werner, Ph.D., *Seismic Systems & Engineering Consultants*

**Session 1-MON-R3 – OCC 203**

**SEISMIC DESIGN AND RETROFIT OF BRIDGE STRUCTURES**

This session addresses seismic design and retrofit programs, case studies, and methods for bridge structures.

**Moderator:** Tom Cooper, P.E., M.ASCE., *PB Americas*

- ≈ **Performance Based Design of Seismic Isolated Bridges in Near Fault Zones using Elastic Gap Devices**  
Memduh Karalar, M.Sc., Murat Dicleli, Ph.D., *Middle East Technical University*
- ≈ **City of Seattle Bridge Seismic Retrofit Program Philosophy, Policies, and Criteria**  
John Buswell, P.E., *Seattle Department of Transportation*; Lee Marsh, Ph.D., P.E., *BERGER/ABAM Engineers Inc.*; Jim Schettler, P.E., S.E., *Jacobs Engineering*
- ≈ **Seattle's Bridge Seismic Retrofit Program. Ballard Bridge Case Study**  
Bob Fawcett, P.E., Barbara Moffat, P.E., Jim Schettler, P.E., S.E., Sean (Xiaofei) Ying, EIT, *Jacobs Engineering*; Bill Perkins, LEG, *Shannon and Wilson, Inc.*; Yuling Teo, P.E., *SDOT*
- ≈ **Research on Rapidly Constructed CFT Bridge Piers Suitable for Seismic Design**  
Charles Roeder, Ph.D., P.E., Dawn Lehman, Ph.D., *University of Washington*



**MONDAY, June 29, 2009 - continued**

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9:45am - 11:15am *Concurrent Breakout Sessions*

**Session 1-MON-R4 – OCC 204**

**PIPELINES SESSION 1 - PANEL DISCUSSION**

A panel comprised of practitioners from academia consulting engineering firms, and industry will discuss geohazard effects on oil gas pipelines. In addition to seismic hazards, seafloor instability associated with hurricanes and other hazards such as coal mining subsidence, landslides, frost heave, and iceberg gouging of the seafloor across pipelines will be discussed.

**Moderator:** Doug Nyman, Ph.D., *D. J. Nyman & Associates*

**Panelists:** Thomas O'Rourke, M.ASCE, *Cornell University*

Rick Gailing, *Southern California Gas Co.*

Dr. Phillip J. Hogan, *Furgo West, Inc.*

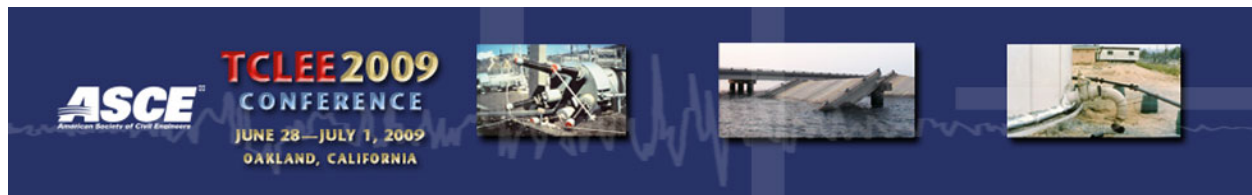
**Session 1-MON-R5 – OCC 205**

**LIFELINES INTERDEPENDENCE**

Lifeline systems that ensure economic vitality, national security, governance, and quality of life to communities nationwide do not function as independent entities; rather the functionalities of all such systems are interdependent. This session addresses the performance of such interdependent systems when they are subjected to earthquakes and other multihazards.

**Moderator:** Leonardo Duenas-Osorio, Ph.D., *Rice University*

- ≈ **Seismic Performance Assessment of Interdependent Utility Network Systems of Memphis and St. Louis**  
Huseyin Can Unen, M.Sc., Amr S. Elnashai, *University of Illinois at Urbana-Champaign*; Muhammed Sahin, *Istanbul Technical University*
- ≈ **Reliability-based Design and Growth of Interdependent Lifeline Systems**  
Leonardo Dueñas-Osorio, Ph.D., Xing Min, *Rice University*
- ≈ **Modeling of Restoration Process Associated with Critical Infrastructure and its Interdependency due to a Seismic Disaster**  
Gaku Shoji, Ayumi Toyota, *University of Tsukuba*
- ≈ **Lifeline Interdependence between Power Delivery and Other Lifelines**  
Dorothy Reed, P.E., Ph.D., M.ASCE, *University of Washington*



**MONDAY, June 29, 2009 - continued**

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11:15am - 12:15pm **POSTER SESSIONS – East Hall**

- ≈ **Assessing the Effectiveness of Blast and Seismic Mitigation Measures in an Integrated Design Context**  
Martien Teich and Norbert Gebbeken, *University of the Federal Armed Forces Munich*
- ≈ **The Behaviour of Tuned Liquid Dampers - Experiment and Analytical Solution**  
Dirk Ostermann
- ≈ **Effect of Through Plate Connection on Transferring Loads in CFT Columns**  
Yasaman Balazadeh Minouei, Seyyed Rasoul Mirghaderi, Ph.D., *University of Tehran*
- ≈ **Performance Based Evaluation of Damage Levels for Retrofitting of Structures**  
Shrirang Tande, *Walchand College of Engineering, Sangli*; Sunil Mane, *P.V.P. Institute of Technology, Budhagoan*
- ≈ **Seismic Improvement Performance of a New Hybrid Cold-Formed Wall System by Introduction of Special Details**  
Mohammad Hassan Sayyas, M.Sc., Seyyed Rasoul Mirghaderi, Ph.D., *University of Tehran*
- ≈ **Dynamic Analysis of Structures including Soil-Structure Interaction using Ritz Method**  
Seyyed Aliasghar Arjmandi, MSc, Vahid Lotfi, Ph.D., *Amir Kabir University of Technology*
- ≈ **Comparative Study among Conventional and Adaptive Pushover Methods**  
Mehrad Seifi, MSSE, Farzad Hejazi, MSE, Mohamed Saleh Jaafar, Ph.D., Jamaloddin Noorzaeei, Ph.D., *University Putra Malaysia (UPM)*
- ≈ **Three-Dimensional Damper Elements for Reinforced Concrete Frames**  
Farzad Hejazi, MSE, Abang A. A. Ali, MSc, Mohamed Saleh Jaafar, Ph.D., Jamaloddin Noorzaeei, Ph.D., Waleel A. Thanoon, Ph.D., *University Putra Malaysia (UPM)*; Mehrad Seifi, MSSE, *University Technology Mara (UiTM)*
- ≈ **Seismic Enhancement of Shear Panel Details are Presented in TI809-07 2007**  
Mohammad Hassan Sayyas, M.Sc., Seyyed Rasoul Mirghaderi, Ph.D., *University of Tehra*
- ≈ **A Study on the Earthquake Motion Determination based on Microtremor Measurement along the Expressway**  
Yoshiya Hata, Dr.Eng., *Nippon Koei Co., Ltd.*; Koji Ichii, Dr.Eng., Seiji Kano, Dr.Eng., Susumu Shibao, BA Eng., Takashi Tsuchida, Dr.Eng., *Hiroshima University*



**MONDAY, June 29, 2009 - continued**

1:00pm - 2:30pm *Concurrent Breakout Sessions*

**Session 2-MON-R1 – OCC 201**

**ELECTRIC POWER SESSION 2 - POWER SYSTEM DESIGN & QUALIFICATION STANDARDS**

This session introduces a new ASCE Manual that provides guidance for substation structure design, compares IEC and IEEE equipment standards, presents a proposed new method to qualify transformers and their bushings, an approach to the design of fossil power plants, and a new approach to qualification of electrical components.

**Moderator:** Alex Tang, P.E., *L&T Consulting Inc.*

- ≈ **ASCE Substation Structure Design Guide**  
Leon Kempner, P.E., Ph.D., M.ASCE, *Bonneville Power Administration*
- ≈ **Seismic Design Standards for Electric Substation Equipment**  
Eric Fujisaki, P.E., *Pacific Gas and Electric Company*
- ≈ **Proposed Change to IEEE Qualification of Transformers and their Bushings**  
Anshel Schiff, Ph.D., *Precision Measurement Instruments*
- ≈ **Earthquake Performance of High Voltage Electric Components and New Standards for Seismic Qualification**  
Shakhzod Takhriov, Ph.D., P.E., *Earthquake Engineering Research Center*; Amir Gilani, Ph.D., S.E., *Miyamoto International*
- ≈ **A Seismic Risk Management Model for Electric Power Distribution Networks in Large Cities by Concentration on LoWed-Voltage Substations**  
Mahmood Hosseini, Amir Raoufi, *Int'l Inst. of Earthquake Eng. & Seismology (IIEES)*

**Session 2-MON-R2 – OCC 202**

**PORT SESSION 2 - SEISMIC DESIGN STANDARDS AND CODES FOR PORTS**

This session addresses seismic design criteria for pile-supported wharf structures, seismic guidelines for container cranes, and soil-structure interaction issues and a history of seismic design codes for piers and wharves.

**Moderators:** Gayle Johnson, P.E., *Halcrow, Inc.*  
Nason McCullough, Ph.D., P.E., *CH2M Hill*

- ≈ **Seismic Design Criteria for Pile-Supported Wharves at the Port of Long Beach**  
Cheng Lai, S.E., M.ASCE, *Port of Long Beach*; Arul Arulmoli, Ph.D., GE., F.ASCE, *Earth Mechanics, Inc.*; Omar Jaradat, Ph.D., P.E., M.ASCE, Max Weismair, S.E., *Moffatt & Nichol*
- ≈ **Seismic Guidelines for Container Cranes**  
Erik Soderberg, S.E., Anna Dix, P.E., Jonathan Hsieh, S.E., *Liftech Consultants Inc.*
- ≈ **History of Seismic Design Codes for Piers and Wharves**  
Gayle Johnson, P.E., *Halcrow, Inc.*
- ≈ **Seismic Soil-Structure Interaction Issues for Pile-Supported Piers and Wharves**  
Arul Arulmoli, Ph.D., GE., F.ASCE, *Earth Mechanics, Inc.*



**MONDAY, June 29, 2009 - continued**

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1:00pm - 2:30pm *Concurrent Breakout Sessions*

**Session 2-MON-R3 – OCC 203**

**SEISMIC PERFORMANCE OF TRANSPORTATION FACILITIES**

This session addresses seismic design, retrofit, and vulnerability assessment for major airports and urban mass transit systems, and for culverts and drainage structures.

**Moderator:** Peter McDonough, P.E., M.ASCE, *Questar Corporation*

- ≈ **Upgrading a Lifeline for Seismic Safety through Performance-Based Earthquake Engineering – A Case Study at Anchorage International Airport**  
Randy Loveless, P.E., Paul Crocker, P.E., S.E., David Stierwalt, P.E., David Swanson, P.E., S.E., *Reid Middleton, Inc.*
- ≈ **Retrofitting the Bay Area Rapid Transit District Infrastructure for Earthquakes**  
Tracy Johnson, P.E., *Bay Area Rapid Transit District*; John Eiding, P.E., M.ASCE, *G&E Engineering Systems Inc.*
- ≈ **Vulnerability Assessment of Perimeter Dike System at Oakland International Airport**  
Rajendram Arulnathan, Sathish Murugaiah, Said Salah-Mars, *URS Corporation*; Thomas LaBasco, Frank Lobedan, Mike Morley, Samuel Won, *Port of Oakland*

**Session 2-MON-R4 – OCC 204**

**PIPELINES - SESSION 2**

This session focuses on fragility relationships, damage estimation, and resiliency characterization for buried pipelines.

**Moderator:** Donald Ballantyne, P.E., *MMI Engineering*

- ≈ **New Perspectives on the Damage Estimation for Buried Pipelines Systems due to Seismic Wave Propagation**  
Omar Pineda Porras, Ph.D., *Los Alamos National Laboratory*
- ≈ **Fragility Relations for Buried Segmented Pipe**  
Michael O'Rourke, P.E., Ph.D., *Rensselaer*
- ≈ **Observed Damage of Wastewater Pipelines and Estimated Manhole Uplifts During the 2004 Niigataken Chuetsu, Japan, Earthquake**  
Tetsuo Tobita, Ph.D., Susumu Iai, Dr.Eng., Gi Chun Kang, ME, *Kyoto University*; Yasuhiko Konishi, ME, *Nihon Suido Consultants Co., Ltd.*
- ≈ **Wave Propagation Damage to Continuous Pipe**  
Michael O'Rourke, P.E., Ph.D., *Rensselaer*



**MONDAY, June 29, 2009 - continued**

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1:00pm - 2:30pm **Concurrent Breakout Sessions**

**Session 2-MON-R5 – OCC 205**

**SEISMIC RISK ANALYSIS - SESSION 1**

This seismic risk session, along with the other two sessions in this series, address a variety of lifeline risk evaluation issues including seismic hazard estimation and monitoring issues relevant to lifeline systems, technical and policy issues in lifeline risk-reduction decisions, and risk-based and reliability-based assessments of seismic risks to lifelines.

**Moderator:** Hope Seligson, A.M.ASCE, *MMI Engineering*

- ≈ **Using ShakeCast and ShakeMap for Lifeline Post-Earthquake Response and Earthquake Scenario Planning**  
Kuo-Wan Lin, Ph.D., David J. Wald, Ph.D., *U.S. Geological Survey*; Loren Turner, P.E., *Caltrans*
- ≈ **Independent Technical and Policy-Level Seismic Reviews of Major Lifelines and Critical Facilities in California by the Seismic Safety Commission**  
Fred Turner, SECB, Betsy Mathieson, *CA Seismic Safety Commission*
- ≈ **A fully probabilistic procedure for assessing lifeline risk, and insights for choosing deterministic scenario earthquakes for analysis**  
Nirmal Jayaram, Ph.D. Student, Jack Baker, *Stanford University*
- ≈ **Generation of Spatial Correlative Non-stationary Earthquake Ground Motions Compatible with the Response Spectra**  
Zhiming Liu, Chengbin Du, Juwei Yuan, *Hohai University*

2:30pm - 3:30pm **POSTER SESSIONS – East Hall**

3:30pm - 5:00pm **Concurrent Breakout Sessions**

**Session 3-MON-R1 – OCC 201**

**ELECTRIC POWER SESSION 3 – POWER TRANSMISSION TOWERS**

This session addresses the life-cycle cost of towers, multi-hazard analysis of towers, evaluation of concrete towers, and the evaluation of a power system and the retrofit of towers are discussed.

**Moderator:** Leon Kempner, P.E., Ph.D., M.ASCE, *Bonneville Power Administration*

- ≈ **Life-Cycle Cost Functions for Electrical Substations and Power Transmission Towers under Strong Winds in Mexico**  
David De Leon, *UAEM*; Alberto Lopez, *IIE*
- ≈ **Multi-Hazard Analysis Electric Power Delivery Systems**  
Dorothy Reed, P.E., Ph.D., M.ASCE, *University of Washington*
- ≈ **Seismic Assessment of electric power transmission concrete beams**  
Hamid Reza Vejdani-Noghreiyani, Ahmad Shooshtari, *Ferdowsi University of Mashhad*
- ≈ **Transmission Tower Seismic Risk Mitigation Strategy & Methodology for British Columbia Transmission Corporation**  
Janos Toth, Ph.D., P.Eng., P.E., PMP, Adelana Gilpin-Jackson, *British Columbia Transmission Corporation*; Blain Good, P.Eng., *British Columbia Hydro*



**MONDAY, June 29, 2009 - continued**

3:30pm - 5:00pm *Concurrent Breakout Sessions*

**Session 3-MON-R2 – OCC 202**

**PORT SESSION 3: PANEL DISCUSSION ON SEISMIC RISK ISSUES FOR UNITED STATES PORTS**

This discussion, involving panelists comprised of port engineers from most of the major ports in earthquake-prone regions of the United States, provides a national perspective on a variety of seismic risk issues facing ports throughout the country.

**Moderators:** Dan Mageau and JP Singh

**Panelists:** Barry MacDonnell, *Port of Oakland*  
 Derrick Bellamy, *Port of Charleston*  
 Doug Theissen, *Port of Long Beach*  
 Tony Giollea, *Port of Los Angeles*

Dave Dittmer, *Port of Portland*  
 Scott Bickel, *Port of Tacoma*  
 Todd Cowles, *Port of Anchorage*  
 Reese Robinson, *Port of Seattle*

**Session 3-MON-R3 – OCC 203**

**SEISMIC RISK ANALYSIS OF BRIDGES AND HIGHWAY SYSTEMS**

This session addresses issues related to bridge fragility modeling and their use in seismic risk analysis of highway systems, and how such analyses can be used to guide seismic retrofit priorities.

**Moderator:** Tom Cooper, P.E., M.ASCE., *PB Americas*

- ≈ **Uncertainty Quantification in Analytical Bridge Fragility Curves**  
 Kevin Mackie, Ph.D., *University of Central Florida*; Bryant Nielson, Ph.D., P.E., *Clemson University*
- ≈ **Fragility Curves for a Typical California Box Girder Bridge**  
 Walter Yang, Ph.D., Reginald DesRoches, Ph.D., *Georgia Institute of Technology*; Jamie Padgett, Ph.D., *Rice University*
- ≈ **Risk- and Performance-based Seismic Analysis for Long-span Cable-stayed Bridges**  
 Binbin Wang, Ph.D. Candidate, Wancheng Yuan, Ph.D., *Tongji University*
- ≈ **Seismic Risk Assessment of Highway Transportation Systems Considering Statistical Uncertainty in Bridge Fragility Curves**  
 Swagata Banerjee, Ph.D., Masanobu Shinozuka, Ph.D., *University of California, Irvine*
- ≈ **Network-based Seismic Retrofit Prioritization of Transportation Networks**  
 Liang Chang, Amr S. Elnashai, Billie F. Spencer, *University of Illinois at Urbana-Champaign*

**Session 3-MON-R4 – OCC 204**

**PIPELINES AND RESERVOIRS - SESSION 3**

This pipeline session addresses the behavior of steel pipelines with welded slip joints, and the effects of permanent ground deformation on buried pipelines.

**Moderator:** Michael O'Rourke, P.E., Ph.D., *Rensselaer*

- ≈ **Tensile Behavior of Steel Pipelines with Welded Slip Joints**  
 James A. Mason, Ph.D., P.E., *Stopen Engineering*; Thomas O'Rourke, M.ASCE, *Cornell University*
- ≈ **Compressive Behavior of Steel Pipelines with Welded Slip Joints**  
 James A. Mason, Ph.D., P.E., *Stopen Engineering*; Thomas O'Rourke, M.ASCE, *Cornell University*
- ≈ **Evaluation of Permanent Ground Deformation Effects on Buried Pipelines**  
 Selcuk Toprak, Ph.D., Orhan Alp Cetin, Engin Nacaroglu, *Pamukkale University*
- ≈ **Seismic Retrofit of Timber Roofs on Open-Cut Reservoirs**  
 Bernard Mo, CE, David Lee, P.E. M.ASCE, *East Bay Municipal Utility District*
- ≈ **Rancho Bernardo Reservoir Seismic Upgrade**  
 Michael Pollard, *Psomas*; Simon Wong, S.E., Eric Ng, S.E., *Simon Wong Engineering*;



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**MONDAY, June 29, 2009 - continued**

3:30pm - 5:00pm *Concurrent Breakout Sessions*

**Session 3-MON-R5 – OCC 205**

**SEISMIC RISK ANALYSIS - SESSION 2**

This seismic risk session, along with the other two sessions in this series, addresses a variety of lifeline risk evaluation issues including seismic hazard estimation and monitoring issues relevant to lifeline systems, technical and policy issues in lifeline risk-reduction decisions, and risk-based and reliability-based assessments of seismic risks to lifelines.

**Moderator:** Yumei Wang, F.ASCE., P.E., *State of Oregon*

≈ **Multi-Hazard Reliability Analysis of Lifeline Networks Using ROBDD**

Mohammad Bagher Javanbarg, Dr., Yusuke Ono, Dr., Charles Scawthorn, *Kyoto University*

≈ **Minimal Cutsets Enumeration Seismic Reliability Evaluation of Lifeline Networks with Link and Node Failures**

Mohammad Bagher Javanbarg, Dr., Junji Kiyono, Charles Scawthorn, *Kyoto University*

≈ **A Bayesian Network Framework for Immediate Post-Tues-earthquake Decision-Support**

Michelle Bensi, Armen Der Kiureghian, Daniel Straub, *University of California Berkeley*

≈ **Seismic Risk Analysis and Management for an Existing Lifeline System**

Takeshi Koike, Dr.Eng., *Musashi Institute of Technology*; Toshio Imai, P.E., *JFE Engineering Corporation*

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**TUESDAY, June 30, 2009**

8:00am - 9:00am

**Jewett Ballroom**

**PLENARY SESSION (P-TUES-1) –**

**CRITICAL INFRASTRUCTURE - KEY TO A SUSTAINABLE AND RESILIENT RENEWAL**

**Speaker - Blaine D. Leonard, F.ASCE, P.E.,** *Research Program Manager, Utah Dept. of Transportation, Salt Lake City UT, and President-Tues-Elect of American Society of Civil Engineers*

In recent decades, the physical infrastructure systems that form the basis of America's social and economic fabric have been allowed to decline into alarming disrepair. Reconstructing these systems is a costly but critical endeavor that demands leadership from the engineering community in developing improvements over the existing systems to make them sustainable and resilient. This presentation addresses this leadership role, which must include the development of improved risk identification and communication methods, integrated system evaluation, updated design criteria and operational procedures, and informed risk-reduction decision-making processes.



**TUESDAY, June 30, 2009 - continued**

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9:15am - 10:45am *Concurrent Breakout Sessions*

**Session 1-TUES-R1 – OCC 201**

**LIFELINES INTERDEPENDENCE AND SUSTAINABILITY**

Lifeline systems that ensure economic vitality, national security, governance, and quality of life to communities nationwide do not function as independent entities; rather the functionalities of all such systems are interdependent. This session and the related session (5-R1) addresses the performance of such interdependent systems when they are subjected to earthquakes and other multihazards.

**Moderator:** Jamie Padgett, Ph.D., *Rice University*

- ≈ **Sustainable Infrastructure Systems Subjected to Multiple Threats**  
Jamie Padgett, Ph.D., Kristina Dennemann, Jayadipta Ghosh, *Rice University*
- ≈ **Addressing the Impacts of Climate Change on Transportation Systems and Infrastructure**  
Robert Hyman, AICP, Joanne Potter, M.S., *Cambridge Systematics, Inc.*; Virginia Burkett, Ph.D., *U.S. Geological Survey*;  
Robert Kafalenos, M.S., Michael Savonis, M.S., *Federal Highway Administration*
- ≈ **Reduced Computational Complexity for the Reliability Assessment of Typical Infrastructure Topologies**  
Mauricio Sanchez-Silva, *Universidad de Los Andes*; Jay Datesh, Leonardo Dueñas-Osorio, Ph.D., *Rice University*
- ≈ **Societal Impacts of Infrastructure Failure Interdependencies: Building an Empirical Knowledge Base**  
Stephanie Chang, Ph.D., Courtney Beaubien, M.A.P., Timothy McDaniels, Ph.D., *University of British Columbia*

**Session 1-TUES-R2 – OCC 202**

**PORT SESSION 4 - SEISMIC REHABILITATION FOR PORT STRUCTURES AND MARINE OIL TERMINALS 1**

This session focuses on the seismic rehabilitation of port structures and marine terminals, specifically focused on MOTEMS.

**Moderators:** Martin Eskijian, *California State Lands Commission*  
Rod Iwashita, *Moffatt & Nichol*

- ≈ **Seismic Evaluation and Requalification of Aging Marine Terminals in California**  
Martin Eskijian, *California State Lands Commission*
- ≈ **Seismic Assessment and Rehabilitation of California Marine Oil Terminals**  
William Bruin, P.E., M.ASCE, Marc Percher, P.E., *Halcrow*
- ≈ **Seismic Rehabilitation of Timber Structures**  
Ted Trenkwalder, M.ASCE, Copri, PE, SE, *Ben C. Gerwick, Inc*



**TUESDAY, June 30, 2009 - continued**

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9:15am - 10:45am *Concurrent Breakout Sessions*

**Session 1-TUES-R3 – OCC 203**

**SEISMIC ANALYSIS OF BRIDGES - SESSION 1**

This seismic analysis session and the session that follows together addresses a variety of bridge response analysis issues including the response of suspension bridges and isolated bridges, risk-based visual screening, bridge damage detection from seismic response measurements, effects of near-fault ground motions, and the analysis of microtremor measurements along an expressway to estimate ground motions.

**Moderator:** Mark Yashinsky, P.E., *Caltrans*

- ≈ **Response of an Isolated Bridge to Bi-Directional Earthquake Excitation**  
Goutam Ghosh, Ph.D., *Motilal Nehru National Institute of Technology*; Yogendra Singh, Ph.D., *Indian Institute of Technology Roorkee*
- ≈ **Optimal Isolator Parameters for Economical Mitigation of Seismic Risk for Highway Bridges**  
Memduh Karalar, M.Sc., Murat Dicleli, Ph.D., *Middle East Technical University*
- ≈ **A Study on the Earthquake Motion Determination based on Microtremor Measurement along the Expressway**  
Yoshiya Hata, Dr.Eng., *Nippon Koei Co., Ltd.*; Koji Ichii, Dr.Eng., Seiji Kano, Dr.Eng., Susumu Shibao, BA Eng., Takashi Tsuchida, Dr.Eng., *Hiroshima University*
- ≈ **Pulse-like Near-fault Ground Motion Effects on the Inelastic Response of Bridges**  
Ajit C. Khanse, Ph.D. Candidate, Eric M. Lui, *Syracuse University*

**Session 1-TUES-R4 – OCC 204**

**SEISMIC RISK ANALYSIS - SESSION 3**

This seismic risk session, along with the other two sessions in this series, address a variety of lifeline risk evaluation issues including seismic hazard estimation and monitoring issues relevant to lifeline systems, technical and policy issues in lifeline risk-reduction decisions, and risk-based and reliability-based assessments of seismic risks to lifelines.

**Moderator:** Hope Seligson, A.M.ASCE, *MMI Engineering*

- ≈ **Lessons Learned from Seismic Collapse Assessment of Buildings for Evaluation of Lifeline Structures**  
Abbie Liel, Ph.D., *University of Colorado*; Curt Haselton, Ph.D., P.E., *California State University, Chico*
- ≈ **Rapid Stochastic Assessment of Post-Tsunami Hazard Connectivity and Flow Capacity of Urban Infrastructure Network**  
Junho Song, Ph.D., Young Joo Lee, *University of Illinois*; Seung-Yong Ok, Ph.D., *Seoul National University*
- ≈ **Seismic Site Response for a LNG Facility - Analyses and Lessons Learned**  
Nason McCullough, Ph.D., P.E., Donald Anderson, Ph.D., Benjamin Hoffman, P.E., Deanne Takasumi, P.E., *CH2M Hill*; Stephen Dickenson, Ph.D., *Oregon State University*
- ≈ **Improving Regional Lifeline Resiliency: A Look at Earthquake Risk in Portland Oregon**  
Yumei Wang, F.ASCE., P.E., *State of Oregon*



**TUESDAY, June 30, 2009 - continued**

9:15am - 10:45am *Concurrent Breakout Sessions*

**Session 1-TUES-R5 – OCC 205**

**LIFELINE RESEARCH AT MCEER - EARTHQUAKE ENGINEERING TO EXTREME EVENTS**

*(formerly Multidisciplinary Center for Earthquake Engineering Research)*

This session summarizes selected research projects on seismic risk evaluation and management for lifeline systems and components that have been conducted at the Multidisciplinary Center for Extreme Events Research.

**Moderator:** Stephanie Chang, Ph.D., *University of British Columbia*

- ≈ **Social Impacts of Lifeline Losses: Modeling Displaced Populations and Health Care Functionality**  
Stephanie Chang, Ph.D., Kenneth Elwood, Ph.D. Candidate, Cathy Pasion, M.Sc.P., Soheil Yavari, Ph.D. Candidate, *University of British Columbia*
- ≈ **Expected durations of post-earthquake water service interruptions in Los Angeles**  
Susan Brink, B.A., Rachel Davidson, Ph.D., *University of Delaware*; Taronne Tabucchi, M.S., *Risk Management Solutions, Inc.*
- ≈ **Advances in GIS for Lifeline Visualization and Management**  
Arthur Lembo, *Salisbury University*; Thomas O'Rourke, M.ASCE, *Cornell University*; Amanda Bonneau, Ph.D.
- ≈ **Lifeline Performance During Earthquakes – Owner and Operator Perspective**  
Craig Davis, Ph.D., P.E., G.E., *Los Angeles Department of Water and Power*

10:45am - 11:45am *Poster Sessions – East Hall*

11:45am - 1:15pm

*Jewett Ballroom*

**AWARDS LUNCHEON (P-TUES-2) –**

**TOWARD RESILIENT, SMART AND SELF-HEALING INTERDEPENDENT INFRASTRUCTURES**

**Speaker - S. Massoud Amin**, *Professor and Honeywell/H.W. Sweatt Chair in the Technological Leadership and Director of the Center for the Development of Technological Leadership, University of Minnesota, Minneapolis MN*

Virtually every crucial economic and social function depends on the secure and reliable operation of energy, telecommunications, transportation, financial, and other infrastructures. These major infrastructure systems are dynamic and complex, and management of disturbances in all such networks due to natural disasters, purposeful attack, or unusually high demands requires a basic understanding of the true system dynamics rather than mere sequences of steady state operations. Following such disturbances, effective, intelligent, and distributed control of infrastructure operations is required that would enable parts of the networks to remain operational or even automatically reconfigure in the event of local failures or even threats of failures. This presentation addresses these issues by summarizing holistic risk-based dynamical systems approaches to analysis of the interdependent national infrastructure. These approaches build on advances in the mathematics of complexity, methods of probabilistic risk assessment, and techniques for fast computation and interactive simulation with the goal of increased agility and resilience for large-scale infrastructure systems.



**TUESDAY, June 30, 2009 - continued**

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1:30pm - 3:00pm *Concurrent Breakout Sessions*

**Session 2-TUES-R1 – OCC 201**

**PERFORMANCE OF LIFELINES SUBJECTED TO MULTHAZARDS**

This session addresses the vulnerability and protection of steel bridges subjected to blast and fire hazards, the vulnerability of other lifelines subjected to volcanic and tsunami hazards, and computer simulations for mitigating risks from natural hazards.

**Moderator:** Abolhassan Astaneh-Asl, Ph.D., P.E., *University of California, Berkeley*

- ≈ **Fire Protection of Steel Bridges and the Case of MacArthur Maze Fire Collapse**  
Abolhassan Astaneh-Asl, Ph.D., P.E., Mark P. Thomas, *University of California, Berkeley*; Larry McMichael, Ph.D., Charles R. Noble, Ph.D., *Lawrence Livermore National Laboratory*; Jim Son, Ph.D., *Formerly, University of California, Berkeley*; Aaron P. Wernhoff, *Villanova University, Formerly of Lawrence Livermore National Laboratory*
- ≈ **Blast Protection of Cable-Stayed and Suspension Bridges**  
Jin Son, Ph.D., *MSC Software Corporation, Formerly, University of California, Berkeley*; Abolhassan Astaneh-Asl, Ph.D., P.E., *University of California, Berkeley*
- ≈ **Lifeline Vulnerability to Volcanic Eruption: Learnings from a National Simulation Exercise**  
Dave Brunsdon, P.E., *Kestrel Group Ltd.*; Brian Park, P.E., *Watercare Services Ltd.*
- ≈ **Shoreline Protection Evaluation for a Post-Tues-Tsunami Highway in Indonesia**  
Loida Begley, P.E., *United States Department of Energy*; Lon Elledge, P.E., *CH2M Hill*
- ≈ **Role of Computer Simulation in Mitigating Natural Catastrophic Risks**  
Islam El-adaway, Ph.D., *Mississippi State University*

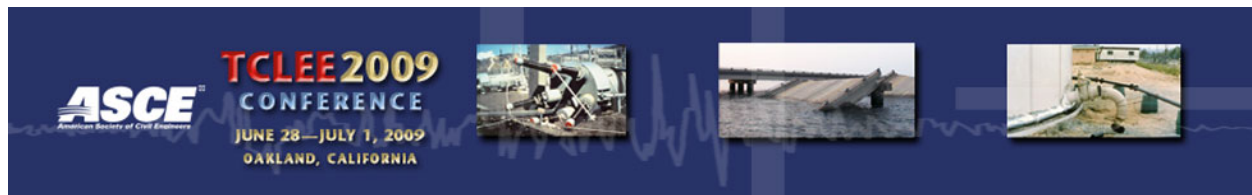
**Session 2-TUES-R2 – OCC 202**

**PORT SESSION 5 - SEISMIC REHABILITATION FOR PORT STRUCTURES AND MARINE OIL TERMINALS 2**

This session focuses on the seismic rehabilitation, design, and soil improvement for of port structures and marine terminals.

**Moderators:** Martin Eskijian, *California State Lands Commission*  
Kendra Oliver, *California State Lands Commission*

- ≈ **Effectiveness of Stone Columns on Slope Deformations beneath Wharves**  
Daniel Mageau, P.E., King Chin, P.E., *GeoEngineers*
- ≈ **Seismic Upgrade of Berths 145-R147 Wharf at the Port of Los Angeles**  
Angel Lim, Raymond Aliviado, *Port of Los Angeles*; Arul Arulmoli, Ph.D., GE., F.ASCE, *Earth Mechnics, Inc.*; Omar Jaradat, Ph.D., P.E., M.ASCE, *Moffatt & Nichol*
- ≈ **Project Specific and System-Wide Considerations for Wharf Retrofit Improvements at the Port of Oakland**  
Thomas LaBasco, *Port of Oakland*
- ≈ **A Case Study on the Use of Advanced Fiberwrap Composites for the Seismic Retrofit of Waterfront Structures**  
Tomas Jimenez, E.I.T., Scott Arnold, P.E., *Fyfe Company*



**TUESDAY, June 30, 2009 - continued**

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1:30pm - 3:00pm *Concurrent Breakout Sessions*

**Session 2-TUES-R3 – OCC 203**

**WATER AND WASTEWATER FACILITIES AND SYSTEMS**

This session explores the seismic assessment of water systems and water system facilities, along with emergency preparedness and response planning.

**Moderator:** Bill Heubach, P.E., M.ASCE., *City of Bellevue, WA*

- ≈ **Simulation of Los Angeles Water Supply Response to 7.8 Mw Earthquake on the San Andreas Fault**  
Natalia Romero, MS/PhD Candidate, Thomas O'Rourke, M.ASCE, Linda Nozick, *Cornell University*
- ≈ **Emergency Staff Mobilization for Water Supply under Malfunction of Transportation Systems**  
Yasuko Kuwata, Dr.Eng., Hirokazu Yasui, MEng, *Kobe University*
- ≈ **Probabilistic Seismic Damage Assessment of Water Supply Networks following an Earthquake**  
Mohammadreza Zolfaghari, Dr., *Catrisk*; Mousa Akbari, MSc, *KNTU*
- ≈ **Water Treatment Plant Seismic Risk Assessment for the Joint Water Commission, Hillsboro, Oregon**  
Donald Ballantyne, P.E., *MMI Engineering*; Peter Martins, P.E., *City of Hillsboro*; Todd Perimon, P.E., *Carollo Engineers*

**Session 2-TUES-R4 – OCC 204**

**GEOTECHNICAL EARTHQUAKE ENGINEERING FOR LIFELINES**

Geotechnical earthquake engineering for lifelines includes assessment of seismic hazards, effects of liquefiable and non liquefiable soil conditions on the performance of lifeline foundation elements, and soil improvement methods for lifelines. These topics are addressed in this session.

**Moderator:** Yumei Wang, F.ASCE., P.E., *State of Oregon*

- ≈ **Seismic Performance of Large Underground Structures in Dry and Liquefiable Soils**  
Mohammad Reza Okhovat, Koichi Maekawa, *The University of Tokyo*
- ≈ **Protecting Lifelines by Rubber-Soil Mixtures**  
Hing-Ho Tsang, Ph.D., *The University of Hong Kong*
- ≈ **Ground Motion Selection and Modification: An Overview**  
Curt Haselton, Ph.D., P.E., *California State University, Chico*
- ≈ **Real-Time Remote Monitoring of Perturbed Force on Pre-Stressed Cable in Rock Slopes**  
Manchao He, Jili Feng, Bin Zhang, *China University of Mining & Technology, Beijing*; Xue Han, *Heilongjiang Institute of Science and Technology*



**TUESDAY, June 30, 2009 - continued**

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1:30pm - 3:00pm *Concurrent Breakout Sessions*

**Session 2-TUES-R5 – OCC 205**

**PANEL DISCUSSION - ASSET INTEGRITY MANAGEMENT FOR LIFELINE RISK REDUCTION PROJECTS**

Asset Integrity Management (AIM) can generally be defined as a holistic analysis of short term and long term facility (or facility component) capital improvement planning, taking into account: maintenance, process or functional upgrade needs, regulatory compliance, risk management, and replacement needs. This panel discussion addresses the applicability and benefits of AIM for lifeline risk reduction projects.

**Moderator:** John Masek, P.E., S.E., M.ASCE, *VIE Consultants, Inc., Weber Basin Water Conservancy District*

**Panelists:** Dr. Colin Chung, *Principal Consultant, MWH*  
Ruth Lehmann, *Kleinfelder*  
Pamela Bailey Campbell, *Senior VP, Parsons Brinckenhoff*

3:30pm - 4:15pm

*Jewett Ballroom*

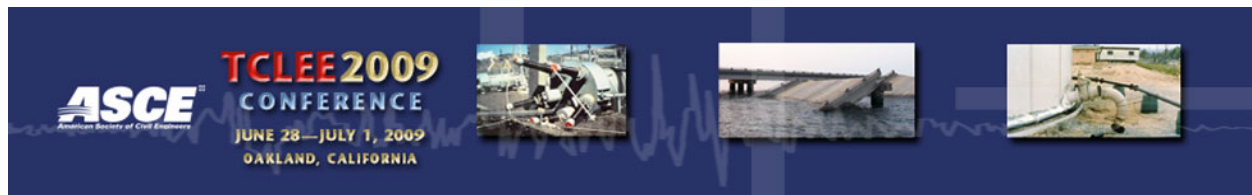
**PLENARY SESSION – (P-TUES-3)**

**DISASTER RISK MANAGEMENT FROM THE PERSPECTIVE OF A MULTILATERAL FINANCIAL INSTITUTION**

**Moderator:** Tom Cooper, P.E., M.ASCE., *PB Americas*

**Speaker:** John Scales, *China Transport Section Coordinator Beijing, China*

This panel session will summarize the function of a multilateral financial institution, such as the World Bank, in supporting its clients' development of strategic plans for disaster risk management. This function includes assistance in mitigating impacts of disasters, reducing building and infrastructure vulnerabilities in hazard prone areas, and facilitating rapid post-disaster recovery. The importance of mainstreaming disaster risk reduction (DRR) into development programs to help prevent future disasters will be explored, along with methods for integrating DRR into recovery planning in order to ensure that rebuilt assets are sustainable and resilient to future disasters. Case studies of World Bank assistance to risk management efforts following disasters caused by tsunamis, typhoons, flooding, and earthquakes will be presented. Successful and unsuccessful aspects of these assistance programs will also be addressed, along with institutional challenges and socio-economic impacts.



**TUESDAY, June 30, 2009 - continued**

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4:30pm - 6:00pm *Concurrent Breakout Sessions*

**Session 3-TUES-R1 – OCC 201**

**PERFORMANCE OF LIFELINES DURING MAJOR EARTHQUAKE ALONG HAYWARD FAULT**

This session addresses risks to Bay Area power, gas, and water systems due to a major earthquake along the Hayward Fault, and various measures for reducing these risks to acceptable levels.

**Moderators:** John Eiding, P.E., M.ASCE, *G&E Engineering Systems Inc.*  
Keith Knudsen, *URS Corporation*

- ≈ **Seismic Safety of Water Lifelines: An Ongoing Process**  
William Cain, S.E., M.ASCE, Xavier Irias, P.E., M.ASCE, David Pratt, P.E., M.ASCE., *East Bay Municipal Utility District*
- ≈ **Performance of PG&E's Electric Transmission System in a 7M Hayward Earthquake**  
Eric Fujisaki, P.E., *Pacific Gas and Electric Company*
- ≈ **Pacific Gas and Electric Company Gas System Preparations for a Future Hayward Earthquake**  
Chi-Hung Lee, Kent Ferre, William Manegold, Marcia McLaren, Stuart Nishenko, Joseph Sun, Kassim Visram, *Pacific Gas and Electric*; Robert Givler, Christopher Hitchcock, David Slayter, Sean Sundermann, Mark Zellman, *Willam Lettis and Associates, Inc.*
- ≈ **Earthquake Lifeline Performance - Municipal Water System in a Mid-Size City**  
Alex Ameri, P.E., *City of Hayward*
- ≈ **City of Milpitas Water Distribution System Seismic Plan**  
Kathleen Phalen, P.E., Greg Armendariz, P.E., *City of Milpitas*

**Session 3-TUES-R2 – OCC 202**

**PORT SESSION 6 - SEISMIC RESPONSE AND INSTRUMENTATION OF PORT INFRASTRUCTURE**

This session focuses on the seismic response and strong motion instrumentation for port infrastructure, wharf structures, container cranes, and pile elements.

**Moderators:** Javier Moncada and Moh Huang, Ph.D., *California Geological Survey*

- ≈ **A Comparison Study of Engineering Approaches for Seismic Design of Sheetpile Quay Walls**  
Endi Zhai, Ph.D., P.E., G.E., *HDR Engineering, Inc.*; Mariusz Sieraszki, Ph.D., P.E., *Kleinfelder, Inc.*
- ≈ **Strong Motion Instrumentation of Seismically-Strengthened Port Structures in California by CSMIP**  
Moh Huang, Ph.D., Anthony Shakal, Ph.D., *California Geological Survey*
- ≈ **Performance Evaluation of Pile-Supported Wharf under Seismic Loading**  
Ungjin Na, *Busan Port Construction Office, Ministry of Land, Transport and Maritime*; Samit Ray Chaudhuri, Ph.D., Masanobu Shinozuka, Ph.D., *University of California, Irvine*



**TUESDAY, June 30, 2009 - continued**

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4:30pm - 6:00pm *Concurrent Breakout Sessions*

**Session 3-TUES-R3 – OCC 203**

**SEISMIC ANALYSIS OF BRIDGES - SESSION 2**

This seismic analysis session and the preceding session together addresses a variety of bridge response analysis issues including the response of suspension bridges and isolated bridges, risk-based visual screening, bridge damage detection from seismic response measurements, effects of near-fault ground motions, and the analysis of microtremor measurements along an expressway to estimate ground motions.

**Moderator:** Tom Cooper, P.E., M.ASCE., *PB Americas*

- ≈ **Seismic Analysis and Design Optimization of a Self-Anchored Suspension Bridge**  
Yong Gao, Ph.D. Candidate, Xinjian Cao, Ph.D. Candidate, Wancheng Yuan, Ph.D., Mi Zhou, Ph.D. Candidate, *Tongji University*
- ≈ **Risk-Based Rapid Visual Screening of Bridges**  
Mahdi Modirzadeh, M.A.Sc. Candidate, Solom Tesfamariam, Ph.D., *The University of British Columbia*
- ≈ **Utilization of Seismic Response Measurement for Damage Detection and Capacity Estimation of Bridges**  
Serdar Soyoz, Ph.D., *MMI Engineering*; Maria Feng, Ph.D., Masanobu Shinozuka, Ph.D., *University of California, Irvine*
- ≈ **Dynamic Response of Suspension Spans of the San Francisco-Oakland Bay Bridge**  
David McCallen, Ph.D., Larry Hutchings, Shawn Larson, *Lawrence Livermore National Laboratory*; Abolhassan Astaneh-Asl, Ph.D., P.E., *University of California, Berkeley*

**Session 3-TUES-R4 – OCC 204**

**PERFORMANCE OF LIFELINES DURING WENCHUAN EQ - SPECIAL SESSION 1**

The 2008 Wenchuan, China Earthquake caused significant damage to transportation, power, communication, and dam lifelines throughout the affected region. This session and the related session that follows relates this damage to the characteristics of these lifelines, and addresses lessons learned related to engineering and emergency response and recovery measures for improving the future seismic performance of these lifeline systems and components.

**Moderator:** David Lee, P.E. M.ASCE, *East Bay Municipal Utility District*

- ≈ **Emergency Response and Recovery after the May 12, 2008 Wenchuan Earthquake**  
Curtis Edwards, *Psomas*
- ≈ **Dam Damage: Evaluating and Learning From the Wenchuan Earthquake's Impact to China's Dams**  
Del Shannon, P.E., *Black & Veatch Corporation*
- ≈ **Performance of Highway Structures during the May 12, 2008 Wenchuan, China Earthquake**  
Mark Yashinsky, P.E., *Caltrans*



## TUESDAY, June 30, 2009 - continued

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4:30pm - 6:00pm *Concurrent Breakout Sessions*

### Session 3-TUES-R5 – OCC 205

#### **GAS & LIQUID FUELS - SESSION 1**

This session focuses on current research and seismic design issues relating to natural gas and petroleum pipelines, as well as storage facilities. Seismic performance standards and guidelines are also discussed.

**Moderator:** Doug Nyman, Ph.D., *D. J. Nyman & Associates*

- ≈ **Seismic Issues Finally Addressed in Federal Pipeline Safety Regulations**  
Peter McDonough, P.E., M.ASCE, *Questar Corporation*
- ≈ **Simulation of Sloshing Effects in Cylindrical Tanks and Evaluation of Seismic Performance**  
Sami Kilic, *Bogazici University*
- ≈ **A Verification Study of ASCE Recommended Guidelines for Evaluation and Design of ‘on Pipe-way Piping’ in Petrochemical Plants**  
Omid Azizpour, Ph.D. Candidate, Mahmood Hosseini, *Int'l Inst. of Earthquake Eng. & Seismology (IIEES)*
- ≈ **Strain in Pipe Elbows Due to Wave Propagation Hazards**  
Patrick McLaughlin, P.E., *Knolls Atomic Power Laboratory*
- ≈ **Missing Factors in Seismic Safety Evaluation of Petrochemical Facilities by Practicing Engineers**  
Mahmood Hosseini, *Int'l Inst. of Earthquake Eng. & Seismology (IIEES)*; Mehran Seyed Razzaghi, Ph.D., *Islamic Azad University, Qazvin Branch*; Farid Sharifi, *Behsazeh Andishan Consultants*

## WEDNESDAY, July 1, 2009

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8:00am - 9:30am *Concurrent Breakout Sessions*

### Session 1-WED-R1 – OCC 201

#### **PERFORMANCE OF LIFELINES DURING HURRICANE KATRINA**

Hurricane Katrina caused significant damage to critical lifeline systems including highways and bridges, ports, hospitals, and power systems. This session highlights the impact that the hurricane had on these lifelines and lessons learned from this damage that can reduce risks to lifelines not only from hurricanes but from earthquakes and other natural hazards as well.

**Moderator:** Reggie Des Roches, Ph.D., M.ASCE., *Georgia Institute of Technology*

- ≈ **Performance of water and gas pipes in past earthquakes and hurricanes**  
Camille Rubeiz, P.E., *Plastics Pipe Institute*
- ≈ **South Louisiana River and Coastal Ports: Lessons Learned from Hurricane Katrina**  
Glenn Riz, Ph.D., *Georgia Institute of Technology*
- ≈ **Wind Damage to Dockside Container Cranes, Recent Failures and Recommendations**  
Patrick McCarthy, P.E., Anna Dix, P.E., Erik Soderberg, S.E., *Liftech Consultants Inc.*
- ≈ **Lessons in Bridge Vulnerability from Hurricane Katrina: Reconnaissance Findings and Analysis of Empirical Data**  
Jamie Padgett, Ph.D., April Spiller, *Rice University*
- ≈ **Impact of Hurricane Katrina on Hospital Lifelines**  
Mark Pickett, Ph.D., P.E., *University of Toledo*



**WEDNESDAY, July 1, 2009 - continued**

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8:00am - 9:30am *Concurrent Breakout Sessions*

**Session 1-WED-R2 – OCC 202**

**DAM ANALYSIS AND SAFETY**

Poor seismic performance of dams and reservoirs can threaten downstream communities and compromise water supplies. This session will address the analysis of concrete gravity dams and arch dams, seismic safety programs for dams, and seismic retrofit of reservoirs.

**Moderator:** Bill Heubach, P.E., M.ASCE., *City of Bellevue, WA*

- ≈ **Seismic Stability Analysis of Concrete Gravity Dam With Penetrated Cracks**  
Shouyan Jiang, JSY, Chengbin Du, *Hohai University*
- ≈ **Bolstering Lifeline Resilience through a Comprehensive Dam Safety Program**  
Atta Yiadom, P.E., Elizabeth Bialek, P.E., *East Bay Municipal Utility District*
- ≈ **A New Modal Technique for Seismic Analysis of Arch Dams including DaMon-Reservoir Interaction**  
Ahmad Aftabi Sani, *Islamic Azad University*; Vahid Lotfi, Ph.D., *Amir Kabir University of Technology*

**Session 1-WED-R3 – OCC 203**

**PANEL DISCUSSION - LIFELINE RISK MANAGEMENT PROJECT FUNDING**

This panel session provides specific examples of multihazard risk management projects for lifeline infrastructure that have been successfully funded and implemented. The session addresses such topics as how to successfully obtain federal mitigation grants, municipal bonds, tolls and assessments, combining hazard mitigation with facility modernization for replacement, leveraging energy or water conservation projects and other techniques. Specific examples for successfully funded projects are summarized. Attendees at the session will be invited to raise questions to the panel regarding their specific project funding needs.

**Moderator:** John Masek, P.E., S.E., M.ASCE, VIE Consultants, Inc., Weber Basin Water Conservancy District

**Panelists:** Richard Bay, CEO, *Jordan Valley Water*  
Pamela Bailey Campbell, Senior VP, *Parsons Brinckenhoff*  
David Kennard, Hazard Mitigation Branch, Chief, *FEMA Region IX*  
Johanna Fenton, Physical Scientist, *FEMA Region IX*  
Michael Engelbrecht, SVP, *Public Finance Division, Wells Fargo*



**WEDNESDAY, July 1, 2009 - continued**

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8:00am - 9:30am *Concurrent Breakout Sessions*

**Session 1-WED-R4 – OCC 204**

**PERFORMANCE OF LIFELINES DURING WENCHUAN EQ - SPECIAL SESSION 2**

The 2008 Wenchuan, China Earthquake caused significant damage to transportation, power, communication, and dam lifelines throughout the affected region. This session and the related preceding session relates this damage to the characteristics of these lifelines, and addresses lessons learned related to engineering and emergency response and recovery measures for improving the future seismic performance of these lifeline systems and components.

**Moderator:** Curt Edwards, P.E., F.ASCE., Psomas

- ≈ **Wenchuan Earthquake Impact to Power Systems**  
John Eidinger, P.E., M.ASCE, *G&E Engineering Systems Inc.*
- ≈ **May 12, 2008 Wenchuan Earthquake - Lessons Learned from Its Impact, Emergency Response and Recovery**  
Robert Lo, P.E., *Klohn Crippen Berger*
- ≈ **Telecommunications Performance - Wenchuan, Sichuan Earthquake**  
Alex Tang, P.E., *L&T Consulting Inc.*
- ≈ **Potable Water System Damage and Recovery from M8.0 Wenchuan Earthquake, China**  
David Lee, P.E. M.ASCE, *East Bay Municipal Utility District*

**Session 1-WED-R5 – OCC 205**

**LIFELINE RESEARCH AT THE PACIFIC EARTHQUAKE ENGINEERING RESEARCH (PEER) CENTER**

This session summarizes selected research projects conducted under the Lifelines Program at the Pacific Earthquake Engineering Research Center. These projects address liquefaction and tsunami hazards, seismic performance evaluation of bridges and pile foundations, and seismic risk analysis of highway systems.

**Moderator:** Tom Shantz, *Caltrans*

- ≈ **Design Guidelines for Pile Foundations in Laterally Spreading Soils**  
Scott Ashford, P.E., Ph.D, *Oregon State University*; Ross Boulanger, *University of California, Davis*; Scott Brandenburg, Ph.D., *UCLA*; Tom Shantz, *Caltrans*
- ≈ **Geology and Case History Based Liquefaction Hazard Screening at Caltrans Bridge Sites**  
Keith Knudsen, Jacqueline Bott, *URS Corporation*; Marvin Woods, Terilee McGuire *California Geologic Survey*
- ≈ **Transportation System Direct Loss Exceedance Analysis with Subsystem Reliability and Retrofit Action Components**  
Renee Lee, Ph.D., *Arup*; Yueyue Fan, *University of California, Davis*; Anne Kiremidjian, *Stanford University*
- ≈ **Probabilistic Tsunami Hazard in California**  
Hong Kie Thio, Paul Somerville, Ph.D, *URS Corporation*
- ≈ **Seismic Risk Evaluation for the Baseline PEER Bridge Testbed**  
Kevin Mackie, Ph.D., *University of Central Florida*; Bozidar Stojadinovic, Ph.D., John-Michael Wong, MS, *University of California Berkeley*



**WEDNESDAY, July 1, 2009 - continued**

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9:45am - 11:15am

*Jewett Ballroom*

**CLOSING PLENARY SESSION (P-WED-1) –**

**LIFELINES AND THE NATIONAL EARTHQUAKE HAZARDS REDUCTION PROGRAM (NEHRP)**

**Moderator - Yumei Wang, P.E., F.ASCE, Oregon Dept of Geology and Mineral Industries and member of NEHRP Advisory Committee on Earthquake Hazards Reduction (ACEHR)**

**Panelists -**

**Jack Hayes, P.E., M.ASCE, National Institute for Standards and Technology and Director of NEHRP**

**Chris Poland, S.E., F.SEAOC, M.ASCE, Degenkolb Engineers; Chair of NEHRP ACEHR**

**Brian Pallasch, Aff.M.ASCE ASCE Managing Director, Government Relations & Infrastructure Initiatives**

The seismic performance of our nation's lifeline systems is an important element of the National Earthquake Hazards Reduction Program (NEHRP). This panel will review the NEHRP program, NEHRP's direction for lifelines, and lifelines as they relate to the 2009 ASCE report card and new stimulus policies.