Final Technical Report (FTR) on USGS' Support of TCLEE 2009 Conference

Award Number: G09AP00119
Principal Investigator: John Segna
Organization: American Society of Civil Engineers (ASCE)
Sponsor's Name: US Geological Survey (USGS)[1]
Conference Title: Technical Council on Lifeline Earthquake Engineering (TCLEE) 2009
Conference Dates: June 28 to July 1, 2009
Conference Program: Attached

1. Introduction

The TCLEE 2009 Conference was held in Oakland, California from June 28 through July 1, 2009, as the seventh in a series of conferences organized by the Technical Council on Lifeline Earthquake Engineering (TCLEE) of the American Society of Civil Engineers (ASCE). Past TCLEE conferences had focused on seismic performance of lifelines. However, over the years, other major natural hazards (floods, extreme winds, volcanoes, and tsunami) as well as man-made hazards (accidental or deliberate) have also caused significant lifeline disruptions that have had national and even international impacts. All the while, our nation's infrastructure continues to age, which increases its vulnerability to these hazards. In view of this, along with the current focus on revitalizing our nation's infrastructure as a means for economic stimulus, there is now an unprecedented opportunity to modernize our lifelines and reduce risks of unacceptable disruption of lifeline operations due to earthquakes and other natural and man-made hazards.

2. Objectives

To address these issues, TCLEE 2009 was developed around a theme entitled Lifeline Earthquake Engineering in a Multihazard Environment, and had the following goals:

a) To bring together engineers, seismologists, geologists, social scientists, and managers from lifeline agencies, academia, government, and the engineering and planning professions worldwide who are involved in the design, retrofit, analysis, planning, and management of lifeline systems subjected to earthquakes, other natural hazards, and man-made hazards.

b) To provide a forum that enables conference attendees to interface, exchange ideas, debate points of view, discuss case studies, methods, and standards, and share experiences, solutions, and lessons learned related to lifelines and their performance under earthquakes and other natural and man-made hazards.

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[1] The conference was sponsored in part by USGS. The $7,500 grant from USGS was used to cover part of the logistics costs of the conference such as meeting room, A/V, etc.

c) To explore similarities and differences between the performance of lifelines subjected to earthquakes and other natural and man-made hazards, and the methods used to design, retrofit, analyze, plan, and manage lifelines subjected to these various hazards.

d) To enable conference attendees to participate in workshops and field trips in various specialty areas related to the conference theme.

e) To introduce industry-standard systems and renowned market applications and products through vendor and organization exhibits.

3. Conference Highlights & Presentations

To meet these goals, TCLEE 2009 included plenary sessions, technical paper presentations, panel discussions, pre-conference workshops, and post-conference field trips. All of these elements of TCLEE 2009 were specifically planned to address a multitude of topics pertaining to the conference theme and objectives.

There were several technical papers that were presented at oral breakout and poster sessions, and were peer reviewed and approved by the Technical Program Committee. These papers addressed the following topics:

- Performance of specific lifeline facilities and systems (electric power, water and wastewater, land and air transportation, seaports, and gas and liquid fuel);

- Analysis and engineering issues that apply across lifelines (e.g., seismic risk analysis, geotechnical earthquake engineering, lifeline interdependence, sustainable lifelines, and performance of various lifeline facilities subjected to blast, fire, volcano, tsunami and geohazards);

- Lifeline risk management project and program planning (project funding issues and asset integrity management);

- Special lifeline research programs (research programs at the Pacific Earthquake Engineering Research Center (PEER) and the MCEER –Earthquake Engineering to Extreme Events (formerly Multidisciplinary Center for Earthquake Engineering Research); and

- Performance of lifelines during major natural hazard events (Hurricane Katrina, Hayward Fault earthquake, and Wenchuan, China earthquake).

The presentations made at the TCLEE 2009 conference are available online at the website of TCLEE 2009. The final schedule and program of the conference have been attached as an appendix to this report.

4. Organizers & Speakers

TCLEE 2009 was organized and convened by ASCE under the direction of the Technical Council on Lifeline Earthquake Engineering. The Conference Organizing Committee consisted of the following members:

Conference Chair
Stuart D. Werner, P.E., F.ASCE, Seismic Systems & Engineering Consultants

Technical Program Chair
Alex K. K. Tang, P.E., F.ASCE, L&T Engineering & Project Management

Steering Committee
Yousef Bozorgnia, Ph.D., M.ASCE, University of California at Berkeley
Reginald DesRoches, Ph.D., M.ASCE, Georgia Institute of Technology
Curtis Edwards, P.E., F.ASCE, Psomas
Andre Filiatrault, Ph.D., P.Eng, M.ASCE, State University of New York at Buffalo
Ian M. Friedland, P.E., M.ASCE, Federal Highway Administration
Hope A. Seligson, A.M.ASCE, MMI Engineering
Yumei Wang, P.E., F.ASCE (Chair), Oregon Dept. of Geology and Mineral Industries

Technical Program Committee
Thomas Cooper, P.E., M.ASCE, PB Americas
Curtis Edwards, P.E., F.ASCE, Psomas
William F. Heubach, P.E., M.ASCE, City of Bellevue, WA
John P. Masek, P.E., S.E., M.ASCE, VIE Consultants, Inc. and Weber Basin Water Conservancy District
Nason McCullough, Ph.D., P.E., M.ASCE, CH2M Hill
Peter W. McDonough, P.E., M.ASCE, Questar Corporation
Anshel J. Schiff, Ph.D., M.ASCE, Stanford University
Alex K.K. Tang, P.E., F.ASCE, (Chair) L&T Engineering & Project Management

Activities Chair
Ahmed Nisar, P.E., MMI Engineering

Sponsorship Chair
Stuart Nishenko, Ph.D., Pacific Gas & Electric Company

Plenary Session Speakers
The following speakers substantially enhanced the technical quality of TCLEE 2009 through their outstanding presentations at the conference plenary sessions.

S. Massoud Amin, University of Minnesota
John R. Hayes, National Institute of Standards and Technology
Blaine D. Leonard, Utah Department of Transportation and President-Elect of ASCE
Thomas D. O'Rourke, Cornell University

Brian Pallasch, American Society of Civil Engineers
Chris D. Poland, Degenkolb Engineers
John Scales, World Bank

Technical Session Organizers

In addition to the Technical Program Committee, the following individuals from within and outside of TCLEE organized various pre-planned technical breakout sessions that were important elements of the technical quality of TCLEE 2009.

Yousef Bozorgnia, University of California at Berkeley
Reginald DesRoches, Georgia Institute of Technology
Leonardo Duenas-Osorio, Rice University
Martin L. Eskijian, California State Lands Commission
Gayle S. Johnson, Halcrow
Daniel Mageau, GeoEngineers
Douglas J. Nyman, D.J. Nyman & Associates
Thomas D. O'Rourke, Cornell University
Jamie E. Padgett, Rice University
Glenn J. Rix, Georgia Institute of Technology
Yumei Wang, Oregon Department of Geology & Mineral Industries

Workshop and Field Trip Organizers

In addition to the technical sessions, the conference included workshops and field trips that provided participants with key insights on various issues related to the conference theme and objectives. The following individuals led the planning and organization of these important conference activities:

Mario Baratta, SBC Global
Robert Green, URS Corporation
James Lienkaemper, U.S. Geologic Survey
Kuo-Ean Lin, U.S. Geologic Survey
Ahmed Nisar, MMI Engineering (conference activities chair)
David Schwartz, U.S. Geologic Survey
Robert Tanaka, California Department of Transportation
David Wald, U.S. Geologic Survey

Administrative Support

The following individuals provided administrative support for the conference:

Debra Tucker, Debra Tucker Associates, LLC (TCLEE 2009 Conference Manager)
Tenzing Barshee, ASCE
Joanna Colbourne, ASCE
Lucy King, ASCE
Jeffrey Sandersen, ASCE
Robin Schuldenfrei, Robin Graphics
John Segna, ASCE

Appendix-A

TCLEE 2009 – Final Program

TCLEE2009 CONFERENCE

7th International Conference on Lifeline Earthquake Engineering

Lifeline Earthquake Engineering in a Multihazard Environment

JUNE 28—
JULY 1, 2009

Oakland Marriott
City Center Hotel
Oakland, California

FINAL PROGRAM

Presented by the Technical Council on Lifeline Earthquake Engineering of the American Society of Civil Engineers

ASCE® American Society of Civil Engineers

TECHNICAL COUNCIL ON LIFELINE EARTHQUAKE ENGINEERING TCLEE a division of the American Society of Civil Engineers

TCLEE2009 CONFERENCE

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Courtesy of the San Francisco Convention & Visitors Bureau

COMMITTEE MEETINGS

SUNDAY, JUNE 28, 2009		
9:00 am—12:00 pm	*Room 410*	TCLEE P & P Committee
10:00 am—3:00 pm	*Room 201*	TCLEE Earthquake Investigation Committee
3:00 pm—7:00 pm	*Boardroom 410*	TCLEE ExComm Meeting
TUESDAY, JUNE 30, 2009		
1:30 pm—7:00 pm	*Room 410*	TCLEE Electric Power & Communications Committee
6:30 pm—9:30 pm	*Room 417*	TCLEE Gas & Liquid Fuels Committee
WEDNESDAY, JULY 1, 2009		
12:00 pm—4:00 pm	*Room 212*	TCLEE Ports & Harbors Committee

PROGRAM AT-A-GLANCE

SUNDAY, JUNE 28, 2009	
9:00 am—7:00 pm	Registration Open *Jewett Foyer*
10:00 am—5:00 pm	Pre-Conference Workshops *California, Oakland Rooms*
6:30 pm—8:00 pm	Exhibit Hall Open—IceBreaker Reception *East Hall*
MONDAY, JUNE 29, 2009	
7:30 am—5:00 pm	Registration Open *Jewett Foyer*
8:00 am—9:15 am	Plenary Session *Lifeline Performance Under Extreme Events* *Jewett Ballroom*
9:00 am—4:00 pm	Exhibit Hall Open *East Hall*
9:15 am—9:45 am	Coffee Break in Exhibit Hall *East Hall*
9:45 am—11:15 am	Concurrent Breakout Sessions *Rooms 201, 202, 203, 204, 205*
11:15 am—12:15 pm	Poster Sessions *East Hall*
12 noon—1:00pm	Box Lunch in Exhibit Hall *East Hall*
1:00 pm—2:30 pm	Concurrent Breakout Sessions *Rooms 201, 202, 203, 204, 205*
2:30 pm—3:30 pm	Coffee Break in Exhibit Hall *East Hall*
2:30 pm—3:30 pm	Poster Sessions *East Hall*
3:30 pm—5:00 pm	Concurrent Breakout Sessions *Rooms 201, 202, 203, 204, 205*
6:00 pm—9:00 pm	Workshop *MMI Engineering Offices*
TUESDAY, JUNE 30, 2009	
7:30 am—5:00 pm	Registration Open *Jewett Foyer*
8:00 am—9:00 am	Plenary Session *Jewett Ballroom*
9:00 am—11:45 am	Exhibit Hall Open *East Hall*
9:00 am—10:00 am	Coffee Break in Exhibit Hall *East Hall*
9:15 am—10:45 am	Concurrent Breakout Sessions *Rooms 201, 202, 203, 204, 205*
10:45 am—11:45 am	Poster Sessions *East Hall*
11:45 am—1:15 pm	Awards Luncheon Speaker: Massoud Amin *Jewett Ballroom*
1:30 pm—3:00 pm	Concurrent Breakout Sessions *Rooms 201, 202, 203, 204, 205*
3:00 pm—3:30 pm	Coffee Break *Foyer*
3:30 pm—4:15 pm	Plenary Session *World Bank Perspective on Disaster Risk Management* *Jewett Ballroom*
4:30 pm—6:00 pm	Concurrent Breakout Sessions *Rooms 201, 202, 203, 204, 205*
WEDNESDAY, JULY 1, 2009	
7:30 am—12:30 pm	Registration Open *Jewett Foyer*
8:00 am—9:30 am	Breakout Sessions *Rooms 201, 202, 203, 204, 205*
9:45 am—11:15 am	Plenary Session *Lifelines and NEHRP* *Jewett Ballroom*
12 noon—6:00 pm	Technical Field Trips

Welcome to the TCLEE2009 CONFERENCE

Lifeline Earthquake Engineering in a Multihazard Environment

Over the years, major natural hazards (earthquakes, floods, extreme winds, tsunami) and man-made hazards (accidental or deliberate) have caused significant regional disruptions that have often had national and even international impacts. Furthermore, this experience has consistently shown that the disrupted region's post-event resilience and sustainability will strongly depend on the performance of its lifelines during and after the event.

TCLEE 2009, "Lifeline Earthquake Engineering in a Multihazard Environment," will address this issue by providing a comprehensive array of technical papers pertinent to current practices, recent innovations, and future directions associated with performance requirements, design, analysis, and planning of lifelines subjected to natural and man-made hazards.

Stu Werner
Conference Chair

In the TCLEE conference tradition, emphasis will be placed on technologies for reducing risks from earthquakes. However, TCLEE 2009 will address these technologies from a unique perspective that includes comparisons with lifeline risk–reduction technologies for other natural hazards and man-made hazards. In particular, the conference will include sessions that focus on:

- Differences and commonalities of technologies used to engineer lifelines to resist earthquakes vs. other natural and man-made hazards, and
- How engineering and risk-reduction technologies for each of these hazard types might benefit from exposure to technologies developed for other hazard types.

Alex Tang
Technical Program Chair

With this unique perspective, this conference has attracted a diverse group of attendees involved in the innovative application of technologies for enabling lifelines to resist not only earthquakes but the full range of other natural and man–made hazards as well. These attendees will exchange ideas; debate points of view; discuss case studies, methods, and standards; and share experiences, solutions, and lessons learned.

Yumei Wang
Executive Committee Chair

Thank you for joining us to continue the traditions of past TCLEE conferences by participating in the unique multi–hazard focus of TCLEE 2009. We welcome your participation and contributions, and sincerely hope that the conference's papers, presentations, discussions, workshops, and field trips will enhance current practices and stimulate thinking of research directions for enabling these practices to continue to evolve and develop in the future.

CONFERENCE ORGANIZING COMMITTEE

CONFERENCE CHAIR

Stu Werner, P.E., F.ASCE
Seismic Systems & Engineering Consultants

STEERING COMMITTEE

Yousef Bozorgnia, Ph.D., M.ASCE
University of California at Berkeley

Reggie DesRoches, Ph.D., M.ASCE
Georgia Institute of Technology

Curt Edwards, P.E., F.ASCE
Psomas

Andre Filiatrault, Ph.D., P.Eng., M.ASCE
SUNY Buffalo

Ian Friedland, P.E., M.ASCE
Federal Highway Administration

Hope Seligson, A.M.ASCE
MMI Engineering

Yumei Wang, P.E., F.ASCE
Oregon Dept. of Geology and Mineral Industries

TECHNICAL PROGRAM CHAIR

Alex K.K. Tang, P.E., F.ASCE
L&T Consulting Inc.

SPONSORSHIP CHAIR

Stu Nishenko, Ph.D.
Pacific Gas & Electric Company

ACTIVITIES CHAIR

Ahmed Nisar, P.E.
MMI Engineering

TECHNICAL PROGRAM COMMITTEE

Alex K.K. Tang, P.E., F.ASCE
L&T Consulting Inc.

Tom Cooper, P.E., M.ASCE
PB Americas

Curt Edwards, P.E., F.ASCE
Psomas

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

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

Nason McCullough, Ph.D., P.E., M.ASCE
CH2M Hill

Peter McDonough, P.E., M.ASCE
Questar Corporation

Anshel Schiff, Ph.D., M.ASCE
Stanford University

Oakland, California

Discover a Vibrant, Picturesque City

Oakland's landscape is a picturesque mix of lovely hillside neighborhoods; exciting and diverse architecture; a bustling waterfront; two shimmering lakes; 19 miles of shoreline along the San Francisco Bay; unparalleled Bay views; and more parks and open space per capita than any other city in the Bay Area. Year round vacation weather with temperatures in the 70's throughout summer and fall.

A city on the move, Oakland has emerged as a major economic force in the region. Long a center for international trade, the Port of Oakland is the nation's fourth busiest container port. The Oakland International Airport is served by 12 major domestic and international airlines. Getting around Oakland and the San Francisco Bay area is easy by automobile, BART, bus and ferry.

Courtesy of the Oakland Convention & Visitors Bureau, Oakland Museum of California

The arts are alive in Oakland. Oakland has one of the largest visual and performing arts communities on the West Coast, and the arts are celebrated on every level here, from acclaimed symphony and ballet to museums, galleries, and small arts organizations. The Old Oakland district includes many of the finest examples of Victorian commercial architecture on the West Coast. Oakland's population boomed after the 1906 San Francisco earthquake, and the Broadway Historic District showcases a range of architectural treasures constructed between 1900—1949. Bold new buildings now shine in Oakland's modern skyline. The Ronald V. Dellums Federal Building has been lauded for its use of space and sense of place. Oakland's residents love their city's charming neighborhoods, which include a mix of well-known areas like Montclair, Rockridge, and Piedmont, as well as lesser known districts such as Glenview, Fruitvale, and Temescal.

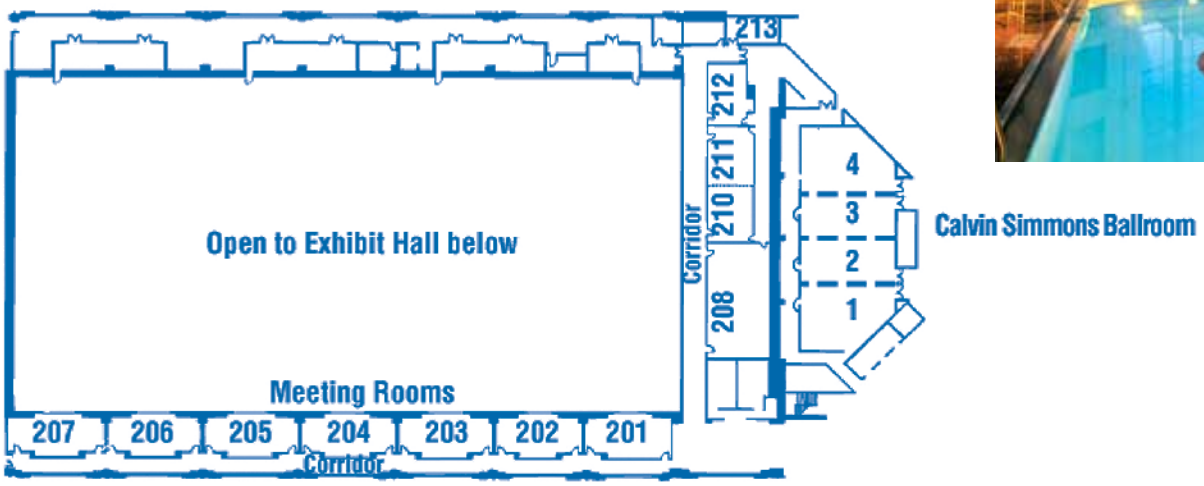
For more information: **www.oaklandcvb.com**

Courtesy of the Oakland Convention & Visitors Bureau, Barry Munn

Hotel Information

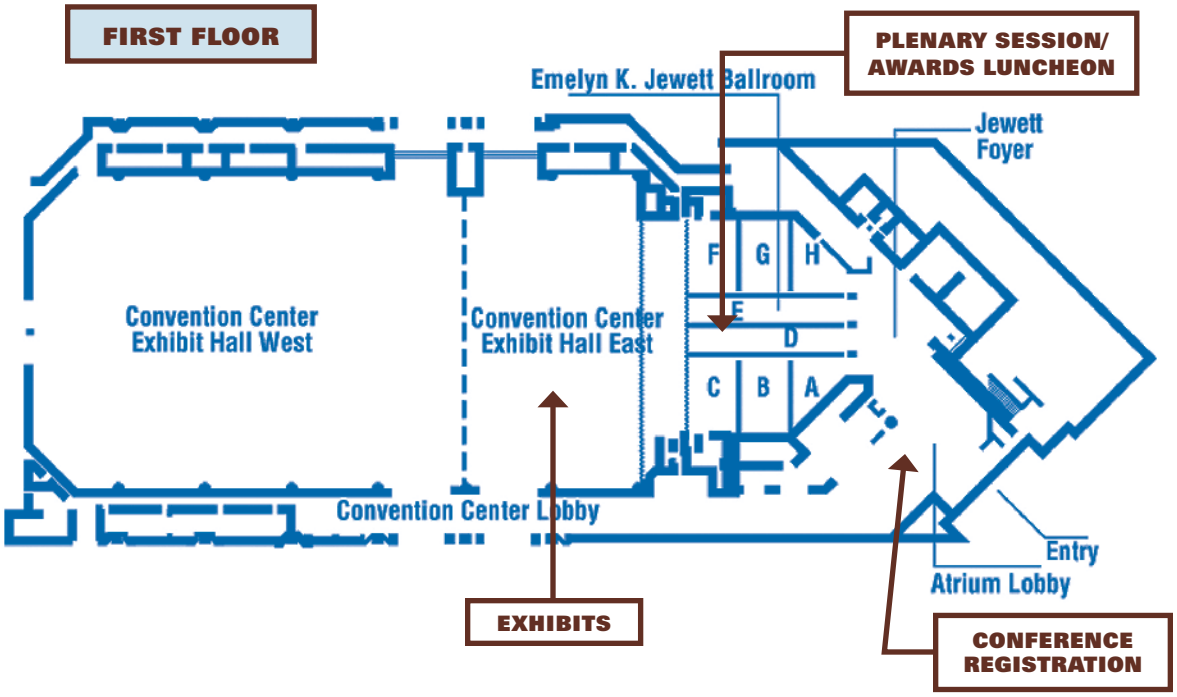
OAKLAND MARRIOTT CITY CENTER
1001 Broadway
Oakland, California 94607
1-510-451-4000 *Phone*
1-510-835-3466 *FAX*

SECOND FLOOR



CONCURRENT BREAKOUT SESSIONS
ROOMS 201, 202, 203, 204, 205

FIRST FLOOR



Conference Details

In order to apply for the Professional Development Hours (PDHs) to which you are entitled for your participation in TCLEE 2009, you will need to complete and submit the PDH form that is in your on-site registration packet. Please follow the directions on the form.

Please note that there are differences from state to state in continuing education requirements for professional engineering licensure. Each state registration board has the final authority to approve courses, credits, professional development hours per course, and other methods of earning credit in that state. ASCE strongly recommends that individuals check regularly with their state registration boards for specific continuing education requirements in their jurisdictions that affect professional engineering licensure and the ability to renew licensure.

CONFERENCE PROCEEDINGS

Conference proceedings will be provided to Full Conference Registrants. Additional copies may be purchased following the Conference by calling ASCE at **800-548-2723** or **703-295-6300** or ordering on-line at **www.pubs.asce.org**

SPEAKER/MODERATOR INFORMATION

All speakers and session moderators are required to register in advance for the Conference and pay appropriate registration fees. All pre-registered moderators will find moderator packets in their conference registration materials. These packets will include speakers' biographies and a copy of the moderator guidelines.

SPEAKERS' PREPARATION ROOM

Room 206, 2nd Floor

A Speakers' Room will operate:

MONDAY	**7:00 am—6:00 pm**
TUESDAY	**7:00 am—6:00 pm**
WEDNESDAY	**7:00 am—11:00 am**

Speakers who are making computer-generated presentations must bring their own computers or arrange with the session moderator to share usage of a computer. ASCE is unable to provide computers for use during the technical sessions.

LUNCH AND REFRESHMENT BREAKS

Refreshments breaks will be offered in the Exhibit Hall mid-morning and mid-afternoon on Monday and Tuesday.

A complimentary buffet lunch will be provided in the Exhibit Hall on Monday and is included in Full, Student and Daily-Monday registrations. The Awards Luncheon on Tuesday is included in Full, Student and Daily-Tuesday registrations. Additional tickets for these lunches may be purchased at the Conference registration desk.

INFORMATION/MESSAGE CENTER

Messages for Conference attendees may be placed through the Oakland Marriott City Center at **(510) 451-4000**. Please ask for the TCLEE 2009 Registration Desk.

Faxes to guests may be sent to: **(510) 835-3466**. Be sure to indicate very clearly on the cover sheet the attendee's full name. If the attendee is not staying at the Oakland Marriott City Center Hotel, write: ***"Please deliver to the TCLEE 2009 Conference Registration Desk,"*** on the cover sheet.

CONFERENCE DRESS

Business casual attire is appropriate for most TCLEE 2009 events. Although jackets are not required for the sessions, they are advisable because conference rooms are typically cool.

LOCAL CUSTOMS

Tips: Service charges or tips are generally not included in published prices in the United States. Restaurant servers, taxi drivers, etc. generally expect a tip of at 15%.

Smoking: Smoking in public areas is usually prohibited in the United States. Smokers should seek out designated smoking areas in hotels, restaurants and other businesses.

Conference Workshops

SUNDAY, JUNE 28, 2009 **10:00 am—5:00 pm**

California Room, Oakland City Center Marriott Hotel

CALIFORNIA EMERGENCY MANAGEMENT AGENCY (CEMA) POST-DISASTER SAFETY ASSESSMENT PROGRAM (SAP) TRAINING FOR EVALUATORS.

This workshop will provide Evaluator Training in accordance with the CEMA SAP. It is intended for civil engineers, architects, building inspectors, and lifeline utility staff who wish to be certified for field evaluation of the safety of buildings, lifelines, and other infrastructure after an earthquake, flood, high wind, or explosion event. This training is approved by the Department of Homeland Security for homeland security grant funding and for CEU's through the California State University. This workshop will be led by Mario Baratta of SBC Global and Robert Green of URS Corporation, who are trained course instructors.

Cost: **$75** **ASCE or IAEM or Cooperating Organization Member**
$100 **Non-Member**

Includes lunch

SUNDAY, JUNE 28, 2009 **10:00 am—2:00 pm**

Oakland Room, Oakland City Center Marriott Hotel

WATER SYSTEM RELIABILITY ASSESSMENT

This workshop will provide a comprehensive discussion of the elements of multi-hazard reliability assessment of water systems It will cover principles and procedures for geo-hazard mapping, component vulnerability assessment, system analysis, development and execution of capital improvement programs, and multi-hazard assessment. The workshop is intended for staff from water utilities or consulting engineering firms who which to expand their understanding of water system risk and reliability concepts and how they can be used in system-wide risk-reduction programs. Presenters will include Ahmed Nisar, Paul Summers, and Don Ballantyne of MMI Engineering, Chris Hitchcock of William Lettis & Associates, and David Lee of East Bay Municipal Utilities District.

Cost: **$75** **ASCE or Cooperating Organization Member**
$100 **Non-Member**

Includes lunch

MONDAY, JUNE 29, 2009 **6:00 pm—9:00 pm**

MMI Engineering Office—
short walk from Oakland City Center Marriott Hotel
Meet at hotel entrance at 6:00 pm to walk to workshop

SHAKECAST SOFTWARE FOR LIFELINE RISK ASSESSMENT AND MANAGEMENT

This workshop will introduce the ShakeCast software to potential users at the TCLEE 2009 conference, and will provide a tutorial on its installation and application. It is intended for emergency response personnel or engineers from utility and transportation lifeline agencies and consulting engineering firms nationwide who wish to initiate or expand their ability to effectively apply the freely available ShakeCast software in order to understand the likely extent and severity of damage to the lifeline facilities for which they are responsible, and to establish appropriate post-earthquake response protocols. Attendees should bring their laptop computer to the workshop. The workshop will be led by David Wald and Kuo-Wan Lin of the United States Geological Survey.

Cost: **$75** **ASCE or Cooperating Organization Member**
$100 **Non-Member**

Includes light dinner

Conference Field Trips

WEDNESDAY, JULY 1, 2009 **12:00 pm—6:00 pm**

A minimum and maximum number of participants will be required for these Field Trips. Box lunches and bus service to/from the Oakland Marriott Hotel will be provided for all Field Trips.

FIELD TRIP #1

CRITICAL INFRASTRUCTURE FAULT CROSSINGS

This field trip will enable participants to observe key locations along the Hayward and Concord Faults where they are crossed by critical transportation, energy and water lifelines. The locations will include fault crossings of the BART mass transit system, a major electrical substation, and key water pipelines. The trip will be organized by geologists David Schwartz and Jim Lienkaemper of the United States Geologic Survey, who have detailed knowledge of the faults and their potential impact on the Bay Area lifelines.
Key fault features and examples of markers such as roads, curbs, and buildings offset by fault creep will be identified in the field.

Cost: **$60** ***per person including box lunch and transportation***

FIELD TRIP #2

WATER LIFELINE SYSTEM FACILITIES

This trip will consist of two main parts. The first will be a visit to the East Bay Municipal Utility District's (EBMUD) Emergency Operations Center in Oakland CA. Following this, the trip will proceed to the San Francisco Public Utility Commission's (SFPUC's) new crossover/isolation valve vaults along two Bay Division Pipelines (78-inch and 96-inch diameter) on either side of the Hayward Fault in Fremont CA. These purpose of these valves is to automatically and/or remotely shut down water flow in either or both of the two pipelines if they are damaged by an earthquake along the Fault and to divert flow into one of the pipelines if it survives the earthquake. These two pipelines are major elements for transmitting water to SFPUC customers from the Hetch Hetchy Reservoir in the Sierra Mountains to the east. This trip will be led by staff from EBMUD and SFPUC who have detailed knowledge of these facilities.

Cost: **$60** ***per person including box lunch and transportation***

FIELD TRIP #3

MAJOR BRIDGE CROSSINGS OF THE SAN FRANCISCO BAY (BOAT TRIP)

This field trip will consist of a boat trip to observe seismic design and retrofit measures constructed by California Department of Transportation (Caltrans) along major bridges that cross the San Francisco Bay. This will include retrofits of the Richmond-San Rafael Bridge, Golden Bate Bridge, and the West Span of the San Francisco Bay Bridge, and the seismic design measures being implemented at the new East Span of this Bridge that is now under construction. The trip will be led by Caltrans engineers who have detailed knowledge of the seismic retrofit and design measures at these various bridges.

Cost: **$80** ***per person including box lunch and bus/boat transportation***

SUNDAY, JUNE 28, 2009

10:00 am—2:00 pm	**OAKLAND ROOM**	Pre-Conference Workshop: **WATER SYSTEM RELIABILITY ASSESSMENT** *Additional registration and ticket required.*
10:00 am—5:00 pm	**CALIFORNIA ROOM**	Pre-Conference Workshop: **CALIFORNIA EMERGENCY MANAGEMENT AGENCY (CEMA) POST-DISASTER SAFETY ASSESSMENT PROGRAM (SAP) TRAINING FOR EVALUATORS** *Additional registration and ticket required.*
6:30 pm—8:00 pm	**EAST HALL**	**EXHIBIT HALL OPEN—ICEBREAKER RECEPTION**

MONDAY, JUNE 29, 2009

8:00 am—9:15 am — **JEWETT BALLROOM**

Welcome & Opening Plenary Session **(P-MON-1)**

LIFELINE PERFORMANCE UNDER EXTREME EVENTS

Thomas O'Rourke

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.

9:00 am—4:00 pm	**EAST HALL**	**EXHIBIT HALL OPEN**
9:15 am—9:45 am	**EAST HALL**	**COFFEE BREAK IN EXHIBIT HALL**

9:45 am—11:15 am — **CONCURRENT BREAKOUT SESSIONS**

Session 1-MON-R1
Room 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., M.ASCE
Precision Measurement Instruments

- **Evaluation of Composite Post Insulators**
  GianPaolo Cimellaro, Andrei Reinhorm, *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 Admin.;* Anshel Schiff, Ph.D., *Stanford University*
- **Seismic Evaluation and Protection of High Voltage Disconnect Switches**
  Dohwan Kong, Andrei Reinhorm, *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 Admin.*
- **Development of a Damage Estimation System for Electric Power Distribution Network**
  Yoshiharu Shumuta, *CRIEPI;* Tatsuhiro Matsumoto, *Sakurai Eng.;* Kengo Takahashi, *DCC*

Session 1-MON-R2
Room 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 Rix, Ph.D.,
Georgia Institute of Technology and
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 Rix, 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 Rix, Ph.D., Abdollah Shafieezadeh, *Georgia Institute of Technology*
- **Seismic Response of Pile-Supported Container Wharves**
  Reginald DesRoches, Ph.D., Glenn Rix, Ph.D., Abdollah Shafieezadeh, *Georgia Institute of Technology;* Stuart D. Werner, P.E., *Seismic Systems & Engineering Consultants*

Session 1-MON-R3
Room 203

SEISMIC DESIGN AND RETROFIT OF BRIDGE STRUCTURES

This session addresses seismic design and retrofit programs, case studies, and methods, as well as rapid construction research 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**
  Jim Schettler, P.E., S.E., *Jacobs Engineering;* John Buswell, P.E., *Seattle Department of Transportation;* Lee Marsh, Ph.D., P.E., *BERGER/ABAM Engineers Inc.*
- **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*

Session 1-MON-R4
Room 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.

Moderators:
Doug Nyman, Ph.D.,
D.J. Nyman & Assoc.
Pete McDonough, P.E., M.ASCE,
Questar Corporation

Panelists:
Thomas O'Rourke, M.ASCE,
Cornell Univ.
Rick Gailing,
Southern California Gas Company
Dr. Phillip J. Hogan,
Fugro West, Inc.

Session 1-MON-R5
Room 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 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*

11:15 am—12:15 pm **EAST HALL**

POSTER SESSIONS

- **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 Noorzaei, 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 Noorzaei, 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 Tehran*

12:00 pm—1:00 pm **EAST HALL**

LUNCH IN EXHIBIT HALL

Included in Full, Student and Daily—Monday registration. Tickets may be purchased for $45.

1:00 pm—2:30 pm **CONCURRENT BREAKOUT SESSION**

Session 2-MON-R1 — Room 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, and discusses new approaches for the design of fossil power plants, and for qualification of electrical components.

Moderator:
Alex Tang, P.E., F.ASCE
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 Low-Voltage Substations**
  Mahmood Hosseini, Amir Raoufi, *Int'l Inst. of Earthquake Eng. & Seismology (IIEES)*

Session 2-MON-R2 — Room 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.

Moderator:
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 Mechnics, Inc.*

Session 2-MON-R3 — Room 203

SEISMIC PERFORMANCE OF TRANSPORTATION FACILITIES

This session addresses seismic design, retrofit, and vulnerability assessment for major airports and urban mass transit systems, and also 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 Eidinger, 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 — Room 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*

Session 2-MON-R5 — Room 205

SEISMIC RISK ANALYSIS—SESSION 1

This seismic risk session, along with the other two sessions in this series (Sessions 3-MON-R5 and 1-TUES-R4) 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*

MONDAY, JUNE 29, 2009 *continued*

2:30 pm—3:30 pm	**EAST HALL**	**COFFEE BREAK IN EXHIBIT HALL**
2:30 pm—3:30 pm	**EAST HALL**	**POSTER SESSIONS** *(see page 9)*

3:30 pm—5:00 pm CONCURRENT BREAKOUT SESSIONS

Session 3–MON–R1
Room 201

ELECTRIC POWER SESSION 3—*ELECTRIC POWER TRANSMISSION TOWERS*

This session addresses the life-cycle cost of towers, multi-hazard analysis, assessment of concrete beams, and seismic risk mitigation strategies for electric power transmission towers.

Moderators:
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-Noghreiyan, 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*

Session 3–MON–R2
Room 202

PORT SESSION 3—*PANEL DISCUSSION ON SESMIC RISK ISSUES FOR UNITED STATES PORTS*

This panel discussion, which involves 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,
GeoEngineers
JP Singh,
J.P. Singh & Associates

Panelists:
Barry MacDonnell, *Port of Oakland*
Derrick Bellamy, *Port of Charleston*
Scott Bickel, *Port of Tacoma*
Todd Cowles, *Port of Anchorage*
Dave Dittmer, *Port of Portland*
Tony Giollea, *Port of Los Angeles*
Reese Robinson, *Port of Seattle*
Doug Theissen, *Port of Long Beach*

Session 3–MON–R3
Room 203

SEISMIC RISK ANALYSIS OF BRIDGES AND HIGHWAY SYSTEMS

This session addresses issues related to the development of bridge fragility models, the use of these models 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
Room 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*

Session 3–MON–R5
Room 205

SEISMIC RISK ANALYSIS—*SESSION 2*

This seismic risk session, along with the other two sessions in this series (Sessions 2-MON-R5 and 1-TUES-R4), 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, P.E., F.ASCE.,
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-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*

6:00 pm—9:00 pm	**MMI ENGINEERING OFFICES**	**WORKSHOP: SHAKECAST SOFTWARE FOR LIFELINE RISK ASSESSMENT AND MANAGEMENT** *Additional registration and ticket required. See page 7 for more details* *Meet at hotel entrance at 6:00 pm to walk to workshop*

TUESDAY, JUNE 30, 2009

8:00 am—9:00 am | **JEWETT BALLROOM**

Plenary Session (P-TUES-1)

CRITICAL INFRASTRUCTURE—KEYS TO A SUSTAINABLE AND RESILIENT RENEWAL

Blaine D. Leonard

Speaker: **Blaine D. Leonard, F.ASCE, P.E.,** *Research Program Manager, Utah Dept. of Transportation, Salt Lake City UT, and President-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.

9:00 am—11:45 am | **EAST HALL** | **EXHIBIT HALL OPEN**

9:00 am—10:00 am | **EAST HALL** | **COFFEE BREAK IN EXHIBIT HALL**

9:15 am—10:45 am | **CONCURRENT BREAKOUT SESSIONS**

Session 1-TUES-R1
Room 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 (2-TUES-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
Room 202

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

This session addresses the seismic rehabilitation of port structures and marine terminals, which a specific focus on the Marine Oil Terminal Engineering and Maintenance Standards (MOTEMS) for California.

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, MASCE, Copri, PE, SE, *Ben C. Gerwick, Inc*

Session 1-TUES-R3
Room 203

SEISMIC ANALYSIS OF BRIDGES—SESSION 1

This seismic analysis session and the session that follows (Session 3-TUES-R3) together addresses a variety of seismic response analysis issues for bridges including the response of suspension bridges and seismically isolated bridges, risk-based visual screening, bridge damage detection from seismic response measurements, effects of near-fault ground motions, and use of micro tremor measurements along an expressway to estimate earthquake 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 Institure 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
Room 204

SEISMIC RISK ANALYSIS—*SESSION 3*

This seismic risk session, along with the other two sessions in this series, (Sessions 2-MON-R5 and 3-MON-R5) 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-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*

Session 1-TUES-R5
Room 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 MCEER—Earthquake Engineering to Extreme Event

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*

10:45 am—11:45 am | **EAST HALL** | **POSTER SESSIONS** *(see page 9)*

TUESDAY, JUNE 30, 2009 *continued*

11:45 am—1:15 pm **JEWETT BALLROOM**

S. Massoud Amin

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.

1:30 pm—3:00 pm **CONCURRENT BREAKOUT SESSIONS**

Session 2–TUES–R1

Room 201

PERFORMANCE OF LIFELINES SUBJECTED TO MULTIHAZARDS

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 PosTues-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

Room 202

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

This session focuses on the seismic rehabilitation, seismic design, and soil improvement for 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 145-147 Wharf at the Port of Los Angeles**
  Angel Lim, Raymond Aliviado, *Port of Los Angeles;* Arul Arulmoli, Ph.D., GE., F.ASCE, *Earth Mechanics, 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*

Session 2–TUES–R3

Room 203

WATER AND WASTEWATER FACILITIES AND SYSTEMS

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

Moderator:
John Eidinger, P.E., M.ASCE, *G & E Engineering Systems, Inc.*

- **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

Room 204

GEOTECHNICAL EARTHQUAKE ENGINEERING FOR LIFELINES

This session on geotechnical earthquake engineering for lifelines addresses the assessment of ground motion hazards, effects of liquefiable and non liquefiable soil conditions on the performance of lifeline foundation elements, and soil improvement methods for lifelines.

Moderator:
Yumei Wang, P.E., F.ASCE., *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*

Session 2–TUES–R5

Room 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,. It accounts for 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, *MWH*
Ruth Lehmann, *Kleinfelder Inc.*
Pamela Bailey Campbell, *Parsons Brinkenhoff*

TUESDAY, JUNE 30, 2009 *continued*

3:00 pm—3:30 pm	**FOYER**	**COFFEE BREAK**

3:30 pm—4:15 pm — **JEWETT BALLROOM**

John Scales

Plenary Session (P-TUES-3)

DISASTER RISK MANAGEMENT FROM THE PERSPECTIVE OF A MULTILATERAL FINANCIAL INSTITUTION

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.

4:30 pm—6:00 pm — CONCURRENT BREAKOUT SESSIONS

Session 3–TUES–R1
Room 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 Eidinger, 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 Assoc., 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
Room 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 Sierasdzki, 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*

Session 3–TUES–R3
Room 203

SEISMIC ANALYSIS OF BRIDGES—SESSION 2

This bridge seismic analysis session and the preceding session on this topic (Session 1-TUES-R3) 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*
- **The Response of Long–Span Bridges to Low Frequency, Near Fault Earthquake Ground Motions**
  David McCallen, Ph.D., Larry Hutchings, PhD., *Lawrence Berkeley National Laboratory,* Shawn Larson, PhD., *Lawrence Livermore National Laboratory,* Abolhassan Astaneh-Asl, Ph.D., P.E., *Univ. of California, Berkeley*

Session 3–TUES–R4
Room 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 (Session 1-WED-R4) discusses how this damage relates 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.

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*

Session 3–TUES–R5
Room 205

GAS AND 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.

Moderators:
Doug Nyman, PhD., *D.J. Nyman & Associates*
Pete McDonough, P.E. M.ASCE *Questar Corporation*

- **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

8:00 am—9:30 am — **CONCURRENT BREAKOUT SESSIONS**

Session 1–WED–R1
Room 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 Rix, 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

Session 1–WED–R2
Room 202

DAM ANALYSIS AND SAFETY

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

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

- **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 Dam-Reservoir Interaction**
  Ahmad Aftabi Sani,
  Islamic Azad University;
  Vahid Lotfi, Ph.D.,
  Amir Kabir University of Technology

Session 1–WED–R3
Room 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 of 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,
Chief Executive Officer,
Jordan Valley Water

Pamela Bailey Campbell,
Senior Vice President,
Parsons Brinkenhoff

David Kennard,
Chief of Hazard Mitigation Branch,
Chief, FEMA Region IX

Johanna Fenton,
Physical Scientist,
FEMA Region IX

Michael Engelbrecht,
Senior Vice President,
Public Finance Division, Wells Fargo

Session 1–WED–R4
Room 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 (Session 3-TUES-R4) on this earthquake 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
Room 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,
California Department of Transportation

- **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 Brandenberg, Ph.D.,
  University of California at Los Angeles;
  Tom Shantz,
  California Department of Transportation
- **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

9:45 am—11:15 am — **JEWETT BALLROOM**

Closing Plenary Session (P-WED-R1)

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*

Jack Hayes

Chris Poland

Brian Pallasch

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.

12:00 pm—6:00 pm

Depart promptly from hotel entrance; tickets required

FIELD TRIPS:

1. **CRITICAL INFRASTRUCTURE FAULT CROSSINGS**
2. **WATER LIFELINE SYSTEM FACILITIES**
3. **MAJOR BRIDGE CROSSINGS OF THE SAN FRANCISCO BAY**

EXHIBITS

East Hall

See you in the Exhibit Hall!

Exhibits reflecting all areas of lifeline earthquake engineering will run throughout the Conference to give you a look at leading edge suppliers and service providers to the industry and ideas for your projects and operations.

CURRENT EXHIBITORS

(as of 5/11/09)

California Emergency Management Agency
www.oes.ca.gov
Information on the Safety Assessment Program which trains engineers to do post-disaster assessment of buildings and infrastructure.

Earthquake Engineering Research Institute
www.eeri.org
The Earthquake Engineering Research Institute is a national, nonprofit, technical society of engineers, geoscientists, architects, planners, public officials, and social scientists. EERI members include researchers, practicing professionals, educators, government officials, and building code regulators.

Fyfe Co. LLC
www.fyfeco.com

Hayward Baker, Inc.
www.haywardbaker.com
Hayward Baker Inc. is the leading specialty foundation contractor in North America. Providing ground improvement techniques to solve seismic problems. Ranked #1 by Engineering News-Record.

Layne GeoConstruction
www.laynegeo.com
Layne GeoConstruction, a division of Layne Christensen Company, is a specialty geotechnical construction company, offering a wide array of service capabilities. A commitment to solution-driven innovation positions Layne GeoConstruction as a leader in jet grouting, drilled micropiles, limited mobility grouting, permeation grouting, tie-back anchors, vibratory ground improvement and stone columns. Real time monitoring can be utilized in the providing of many of these services.

MCEER—Earthquake Engineering to Extreme Events
www.mceer.buffalo.edu
MCEER conducts multidisciplinary research, education, and outreach to develop and disseminate new knowledge, tools and technologies for intelligent infrastructure renewal and resilience against multiple natural and man-made disasters.

Pacific Earthquake Engineering Research Center (PEER)
http://peer.berkeley.edu/
The Pacific Earthquake Engineering Research Center (PEER) is a multidisciplinary, multi–institutional research center that develops, validates and disseminates performance-based seismic design technologies for buildings and infrastructure.

Strong Motion Instrumentation Program
www.quake.ca.gov
Display the engineering earthquake data center via internet showing what earthquake data is available, and how it can be obtained and used for engineering purposes.

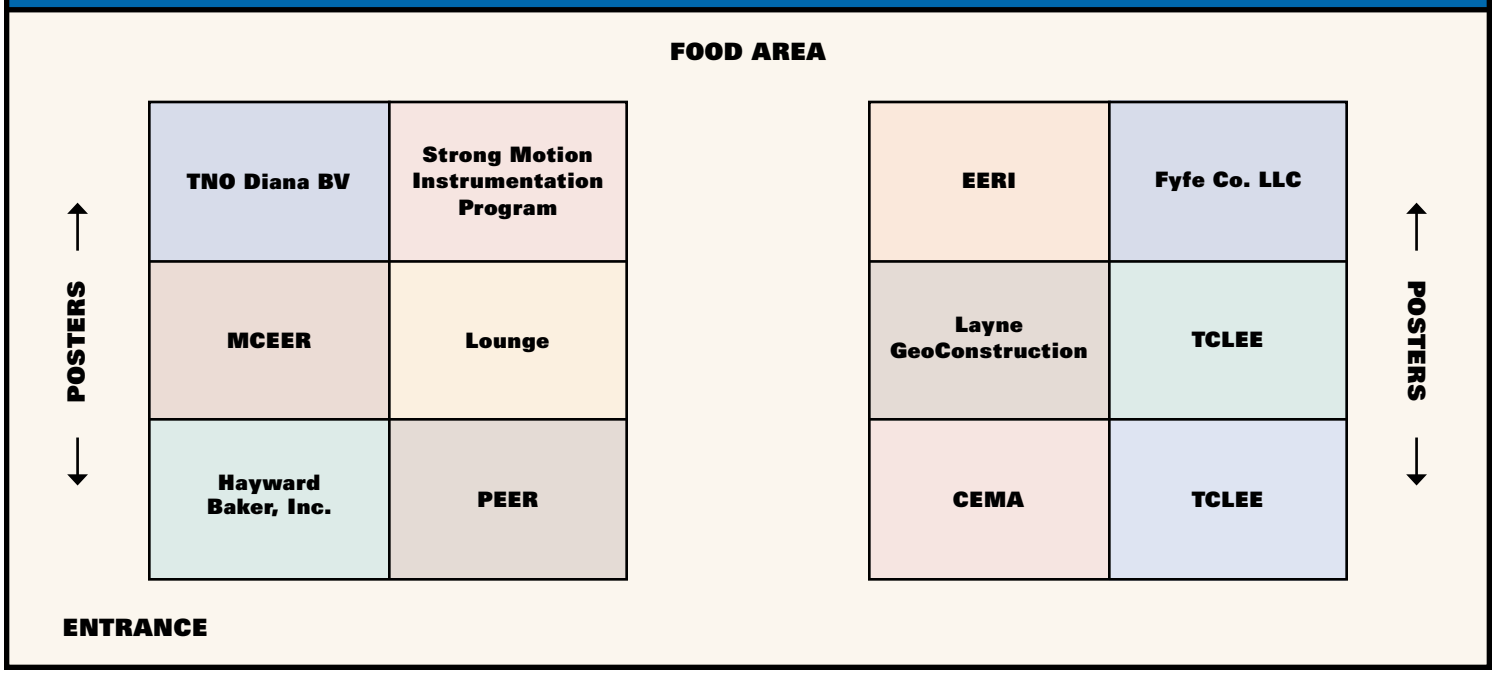
TNO Diana BV
www.tnodiana.com
DIANA (Displacement Analyzer) is a general purpose finite element program for supporting design and assessment decisions in structural, geotechnical and oil and gas engineering.

Technical Council on Lifeline Earthquake Engineering (TCLEE)
http://www.asce.org/instfound/techcomm_tclee.cfm

EXHIBIT HALL HOURS

SUNDAY, JUNE 28, 2009	**6:30 pm–8:00 pm**
Ice Breaker Reception	6:30 pm–8:00 pm
MONDAY, JUNE 29, 2009	**9:00 am–4:00 pm**
Coffee Break	9:15 am–9:45 am
Poster Sessions	11:15 am–12:15 pm
Lunch	12:00 pm—1:00 pm
Poster Sessions/ Refreshment Break	2:30 pm—3:30 pm
TUESDAY, JUNE 30, 2009	**9:00 am—11:45 am**
Coffee Break	9:00 am—9:15 am
Poster Sessions	10:45 am—11:45 am

EXHIBIT HALL FLOORPLAN



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International Association of Emergency Managers (IAEM)

Multidisciplinary Center for Extreme Events Research (MCEER)

Network for Earthquake Engineering Simulation (NEES)

U.S. Geological Survey

U.S. Army Corps of Engineers, Engineer Research and Development Center (ERDC)

Utah Seismic Safety Commission

Western States Seismic Policy Council (WSSPC)

ASCE American Society of Civil Engineers

TECHNICAL COUNCIL ON LIFELINE EARTHQUAKE ENGINEERING TCLEE a division of the American Society of Civil Engineers