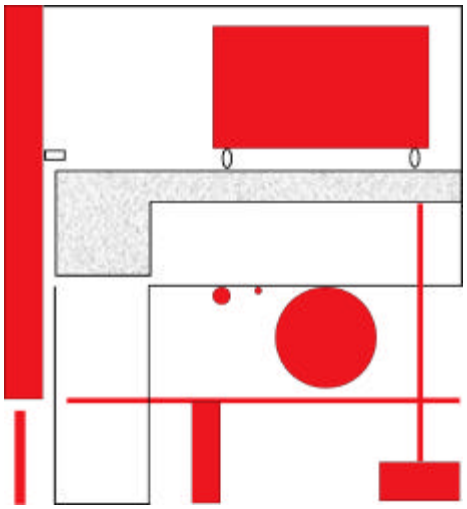
ATC 29-1
SEMINAR



SEISMIC DESIGN, RETROFIT, AND PERFORMANCE OF NONSTRUCTURAL COMPONENTS

January 22-23, 1998
Radisson Miyako Hotel
San Francisco, California

Second Announcement and
Registration Information

ATC-29-1 SEMINAR REGISTRATION FORM

NAME_____
ORGANIZATION _____
ADDRESS _____
CITY/STATE/ZIP CODE_____
BUSINESS PHONE/FAX NUMBER _____
Seminar Registration Fee @ $160 (ATC Subscriber price $128) $_____
☐ Please enroll me as an ATC Subscriber ($25.00 per year, individual rate) $_____
Late Registration Fee, add $20 per registrant (if postmarked after 1/15/98) $_____
TOTAL ENCLOSED☆ $_____

☆ Payment may be made by check or credit card (Master Card or VISA). If paying by credit card, please provide the following information: Master Card ☐ VISA ☐ # _____ Exp: _____/_____
Name (exactly as it appears on the card)_____
Checks should be made payable to ATC. Please mail your completed form with the appropriate payment to:
Applied Technology Council, 555 Twin Dolphin Drive, Suite 550, Redwood City, California 94065

ATC-29-1 SEMINAR ON SEISMIC DESIGN, RETROFIT, AND PERFORMANCE OF NONSTRUCTURAL COMPONENTS

San Francisco • January 22-23, 1998

The Purpose of the Seminar is to present current research, practice, and informed thinking pertinent to seismic design, retrofit, and performance of nonstructural components. The seminar will focus on architectural, electrical, and mechanical components and their supports in buildings, hospitals and other essential facilities, and hazardous material and industrial facilities.

Place and Dates of the Seminar
Radisson Miyako Hotel
1625 Post Street
San Francisco, California
January 22-23, 1998

Seminar Program. The seminar program has been developed for design professionals, regulators, researchers, manufacturers and contractors, insurers, owners, and facility managers. Papers will be presented on the following topics:

- Observed performance in recent earthquakes;
- Seismic design codes, standards, and procedures for commercial and institutional buildings;
- Seismic design issues relating to industrial and hazardous building facilities;
- Design, analysis, and testing; and
- Seismic evaluation and rehabilitation of conventional, hospital, and other essential facilities

Sponsoring Organization
APPLIED TECHNOLOGY COUNCIL
555 Twin Dolphin Drive, Suite 550
Redwood City, CA 94065
Phone: 650/595-1542
Fax: 650/593-2320

Financial Sponsors
NATIONAL CENTER FOR EARTHQUAKE ENGINEERING RESEARCH
State University of New York at Buffalo
NATIONAL SCIENCE FOUNDATION
Arlington, Virginia

Proceedings. Papers presented at the seminar will be published in the seminar Proceedings, which will be available at the start of the seminar.

Steering Committee. C. Rojahn and T. T. Soong (Co-Chairs), C. Arnold, R. E. Bachman, E. T. Dean, M. Grigoriu, S. P. Harris, S. S. Rihal, W. E. Staehlin, and M. P. Singh.

Registration Information. The seminar registration fee is $160 ($128 for ATC Subscribers) and includes the seminar Proceedings, luncheons, and coffee breaks. A late fee of $20 will be imposed on registrations postmarked after January 15, 1998. Persons interested in registering should complete, detach, and submit the ATC-29-1 Seminar Registration Form to ATC.

Accommodation Information. A block of sleeping rooms will be held at the Radisson Miyako Hotel until January 2, 1998 at a special negotiated rate of $149.00 per night (single or double occupancy). To reserve a room, contact the reservations department at 800/333-3333 and identify yourself as a member of the "Applied Technology Council" group to guarantee the special rate. Reservations made after January 2 cannot be guaranteed the negotiated rate.

Location and Parking. The Radisson Miyako Hotel is located in the Japan Center at 1625 Post Street. Parking is available below the hotel at a rate of $10.00 per day.

FINAL SEMINAR PROGRAM

January 22, 1998

8:30 am – 12:00 noon Seminar Registration

10:00 – 10:10 am . OPENING REMARKS
Christopher Rojahn and
T.T. Soong

10:10 am – Noon:

SESSION I: SEISMIC CODE PROVISIONS
Chair: Christopher Arnold

Building Code Seismic Design Provisions for Nonstructural Components (Invited Paper); Robert Bachman

Design Criteria for Nonstructural Components Based on Tri-Services Manuals; Sigmund A. Freeman

The Development of Model Code Provisions to Address System Reliability Following Earthquakes; Gayle S. Johnson, Stephen J. Eder, Robert E. Sheppard, and Steven P. Harris

Simplified Methods for Calculating Seismic Forces for Nonstructural Components; Mahendra P. Singh, Luis M. Morechi, and Luis E. Suarez

A Critique of Procedures for Calculating Seismic Design Forces for Nonstructural Elements; Brian E. Kehoe and Sigmund A. Freeman

Review of Requirements for Design of Nonstructural Components and their Anchorage; Orhan Gurbuz, Sheng Wu, and Scott Wittchen

A Suggested Design Procedure for Piping Systems Defined as Hazardous or Essential by U.S. Building Codes; John D. Stevenson

Noon – 2:00 pm: LUNCH

2:00 –3:00 pm:

SESSION II: OBSERVED SEISMIC PERFORMANCE
Chair: Edwin T. Dean

Lessons Learned from the 1994 Northridge Earthquake on the Vulnerability of Nonstructural Systems; William E. Gates and Gary McGavin

Performance of Nonstructural Components During the January 17, 1994 Northridge Earthquake, Case Studies of Six Instrumented Multistory Buildings; Farzad Naeim and Roy Lobo

Performance and Behavior of Library Shelving and Storage Rack Systems During the 1994 Northridge Earthquake; Satwant S. Rihal and William E. Gates

The Need for Improvement in Post-Earthquake Investigations of the Performance of Nonstructural Components (Invited Paper); Robert Reitherman

3:00 – 5:00 pm:

SESSION III: DESIGN, ANALYSIS AND TESTING
Chair: Mircea Grigoriu

Retrofit Seismic Mitigation of Mainframe **Computers and Associated Equipment: A Case Study;** John D. Meyer, Tsu T. Soong, and Richard H. Hill

Frequency Tuning for Spring-Supported Mechanical Components' Protection; George C. Yao and N. Lien

3:30 – 3:45 pm: BREAK

Upper-Bound Mass Ratios for the Decoupled Analysis and Design of Building-Equipment System; Genda Chen, and Jingning Wu

Simplified Approach to Account for Nonlinear Effects in Seismic Analysis of Nonstructural Components; Roberto Villaverde

Seismic Retrofit of Precast Concrete Connections; Richard J. Nielsen, Edwin R. Schmeckpeper, and Richard Crossler

Simplifying Complex GFRC Cladding Structural Systems in Seismic Hazard Zones: A Case Study; Michael Krakower, Milford W. Donaldson, and Anthony B. Court

Limit States for Architectural Glass Under Simulated Seismic Loadings; Richard A. Behr and Christy L. Worrell

5:00 pm: ADJOURN FIRST DAY

January 23, 1998

8:30 a.m. Day 2 Program Begins

SESSION IV: SEISMIC EVALUATION, DESIGN AND PERFORMANCE
Chair: Satwant S. Rihal

Seismic Evaluation Procedure for Equipment in U. S. Department of Energy Facilities (Invited Paper); Robert C. Murray, Stanley Sommer, Fred Loceff, George Antaki, Gary Driesen, Dan Guzy and Jeffrey Kimball

Computer Tools for Seismic Screening and Evaluation of Equipment and Systems Based on Earthquake Experience Data; Thomas R. Roche, Phillip S. Burtis and Ronald W. Cushing

Earthquake-Caused Hazardous Materials Incidents at Educational Facilities; Guna Selvaduray

City of Los Angeles Proposed Ordinance Changes for Suspended Ceiling Systems Prompted by the 1994 Northridge Earthquake; Gary L. McGavin, James Lai and Steve Ikkanda

Seismic Restraints for Piping and Duct Systems; Robert J. Wasilewski

Seismic Isolation of Semiconductor Production Facilities; Hal Amick, Ahmad Bayat and Zoltan A. Kemeny

10:00 – 10:15 am: BREAK

10:15 – Noon:

SESSION V: RELIABILITY AND FRAGILITY ESTIMATION
Chair Steven P. Harris

The Use of Earthquake Experience Data for Estimates of the Seismic Fragility of Standard Industrial Equipment; Sam W. Swan and Robert Kassawara

Toppling Fragility of Unrestrained Equipment; Z. Y. Zhu and T. T. Soong

Seismic Reliability and Performance of Nonstructural Systems; M. Grigoriu and F. Waisman

Demonstration of CERL Equipment Fragility and Protection Procedure by Fragility Testing of a Power Transformer Bushing; James Wilcoski

California Wine Industry Seismic Risk Analysis and Experimentation Project; Joshua M. Marrow, David Weggel, Abraham Lynn and Satwant Rihal

Study of Seismic Resistance of Desktop Computers; Masami Jin and Abolhassan Astaneh-Asl

Appropriate Seismic Reliability for Critical Equipment Systems: An Approach Based on Regional Analysis of Financial and Life Loss; Keith A. Porter and Charles Scawthorn

Noon – 1:15 pm: LUNCH

1:15 – 3:05 pm:

SESSION VI: PERFORMANCE, EVALUATION AND REHABILITATION
Chair: Mahendra P. Singh

Development and Usage of FEMA 74, Reducing the Risks of Nonstructural Earthquake Damage: A Practical Guide; Eduardo A. Fierro and Cynthia L. Perry

The Requirements for Nonstructural Components for the NEHRP Guidelines for the Seismic Rehabilitation of Buildings; Christopher Arnold

Practical Guidelines for Seismic Retrofitting of HVAC Systems; Patrick J. Lama

Observed Behavior of Italian Hospitals During Severe Earthquakes; G. Di Pasquale, C. Nuti, G. Orsini, and T. Sano

Seismic Design and Performance of Nonstructural Components in Hospitals (Invited Paper); William Staehlin

Seismic Retrofit of Nonstructural Components in Acute Care Hospitals: Title 24, Part 2, Chapter 16, Division III-R Requirements; Charles C. Thiel Jr., Theodore C. Zsutty, Christos Tokas and Patrick Campbell

The Benefits and Costs of Seismic Retrofits of Nonstructural Components for Hospitals, Essential Facilities and Schools; John Eidinger and Kenneth Goettel

3:05 – 3:20 pm: BREAK

3:20 pm:

PANEL DISCUSSION: IMPROVING IMPLEMENTATION OF NONSTRUCTURAL COMPONENT DESIGN AND INSTALLATION

Moderators: Robert E. Bachman (Fluor Daniel) and William Staehlin (California Office of Statewide Health Planning and Development)

Panelists: Richard Henry (McCarthy Construction), Do Kim (Institute for Business and Home Safety), Richard Phillips (Hillman, Biddison & Loevenguth), Dennis Richardson (City of Santa Rosa) and Robert Vlick (ACCO)

4:30 p.m. CLOSING REMARKS AND ADJOURNMENT OF DAY 2
Christopher Rojahn and
T.T. Soong