Mitigation of Seismic Risk in Older Concrete Buildings

NEES-R Grand Challenge

Thalia Anagnos, Mary Comerio, Tara Hutchinson, Ricky Lopez, Adolfo Matamoros, Peter May, Jack Moehle (PI), Khalid Mosalam, Julio Ramirez, Judy Steele, Jon Stewart



Project background



California, 1994



Turkey, 2003

"50% of the casualties are coming from 5% of the buildings." Kircher et al., "Estimated Losses due to a Repeat of the 1906 San Francisco Earthquake, *Earthquake Spectra*, 2006.

Project thesis

- Available guidelines are too conservative
 - most buildings are found inadequate
 - retrofit costs are high
- This "always bad" message
 - is not credible
 - is impeding action
- Improved procedures
 - can reduce the problem
 - can make retrofit programs feasible
- What we learn, both technical and societal, can be translated to other building types and localities.

Research program overview

- Inventory one or two major cities
- Test critical components to collapse
- Investigate simple retrofit methods
- Systems studies, including soilfoundation-structure interaction
- Improved computer simulation
- Regional simulation

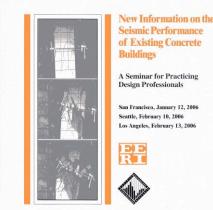
- Craft and evaluate appropriate policies
 - Identify different classes of the problem
 - Structural configuration
 - Occupancy
 - Economic conditions
 - Identify feasible mechanisms
 - Model risk reduction impacts
 - Evaluate economic impacts





Collaborations with existing organizations

- ASCE Standards Committees
- American Concrete Institute
- Applied Technology Council
- EERI Concrete Coalition



An EERI Technical Seminar developed by PEER and funded by FEMA

COSPONSORS: National Canord of Structure Dispatent Association (ICSEA) Internal Engineers Association (ICSEA) Southern California organization Southern California organization Structural Engineers Association of Woohington (SEAW) Structural Engineers Association of Woohington (SEAW) Southern California Earthquide Center (SCEC) The Northern and Stationer California Chergin of EEE