CUREe

CUREe News

Fall 1999

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CUREe is a nonprofit organization devoted to the advancement of earthquake engineering research, education, and implementation whose university members are listed below:

CALTECH STANFORD BERKELEY

DAVIS IRVINE

LOS ANGELES SAN DIEGO USC

THE PRESIDENT'S COLUMN

Professor Karl Romstad, UC Davis

Should CUREe Seek to Become a National Organization?

CUREe's exploration of the proposal that it become a national organization is proceeding in a deliberate manner. The exploration was initiated by the appointment of an ad hoc committee on CUREe membership consisting of Professors Shah (Chair), Iwan, Krawinkler and Mahin. This committee recommended to the Board of Directors that CUREe membership be opened to any research university with demonstrated interest in and contribution to the field of earthquake engineering. They also presented the Board with suggestions on implementing several aspects of such a move including organization name change (retaining the CUREe acronym but making the "C" stand for "Collaborating," "Cooperating," or another word other than "California"); classes of membership, and composition of a Board of Directors. At its November 6th, 1998 meeting, the Board unanimously passed a resolution to "develop a strategy to implement the opening of CUREe membership to any research university in the United States with a demonstrated interest in and contribution to the field of earthquake engineering research, with approval of the Board."

There are two critical, and independent, considerations that need to be assessed before formally adopting and moving forward with such a recommendation to the CUREe membership, who must approve such a change in the Bylaw. First, would the current CUREe membership support the change in the existing Bylaws necessary to implement the recommendation? Second, would research universities outside of California be interested in becoming members if CUREe did open up membership?

To address these questions the Board appointed a strategic planning committee of Professors Fenves (Chair), Beck, Iwan and Romstad and Executive Director Reitherman to develop a strategy to present to the Board to implement the opening of CUREe membership to other US research universities.

This *CUREe News* President's Column is part of the process of seeking input from CUREe members (and other interested readers) on your thoughts regarding this initiative and your preliminary support, or lack of support.

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CUREe-KAJIMA Phase III Research Program

DECISION SUPPORT TOOLS FOR EARTHQUAKE RECOVERY OF BUSINESSES

Project Overview

Recent large earthquakes in urban areas have demonstrated the enormous social and economic impacts that an event of such magnitude can have on a region. The list of impacts is almost endless, and clearly some, such as those involving life safety, are more important than others. The focus of this Joint CUREe-Kajima Phase III research project is on one specific area, that is the effects of an earthquake on the operation of a business. Project researchers on the CUREe team are from the California Institute of Technology and Stanford University.

The basic goal of the project is to develop methodologies for a decision support system (DSS) that will aid business managers in determining how to most effectively recover from a large earthquake. The DSS will propose the optimal recovery plan for the business from a facility standpoint, that is, it will make recommendations for the repair, retrofit, demolition, or reconstruction of a group of damaged buildings and other facilities. The optimization is done with respect to the specific constraints and priorities of the business.

The first year of this two-year project focused on a hypothetical commercial real estate company that owns and leases out several buildings that have suffered, or may suffer, damage during an earthquake. The core problem that was addressed was determining an optimal strategy for repairing the buildings and making that strategy relevant to any company that owns facilities. During the second year, the project will address the impacts on a more general business that manufactures, stores, and sells a product.

Although the DSS is for earthquake recovery of business operations, it is not intended to be used only for the post-earthquake situation. A tool such as this also has enormous potential for aiding business managers in making several types of critical decisions about earthquake risk prior to any earthquake. Potential applications of this DSS are described below.

Application: Post-Event Decision Support

After a large earthquake, the DSS could be used to quickly estimate damage and loss through building-specific loss estimation models and any other information from monitoring and on-site inspections. Based on user constraints and priorities, the DSS will make recommendations as to the optimal recovery strategies for the company's facilities. For example, should each facility be repaired, repaired and upgraded, or demolished and reconstructed, and in what priority order should the facilities be treated? The DSS can be used in an iterative process whereby actual information and intermediate decisions are added to the system to replace estimated or theoretical information.

Application: Scenario Loss Estimation

The DSS could also be used for pre-event planning and evaluation of recovery strategies. In this application, various scenario earthquakes may be hypothesized and the DSS is used to estimate damage and loss with building-specific loss estimation models. The DSS then suggests optimal recovery strategies with associated costs.

Application: Cost-Benefit Life Cycle Risk Evaluation

The DSS could be used for overall earthquake risk management of a company. In this application, for each building, the expected lifetime cost of repairs from earthquakes is included in the performance objective to be maximized. In a post-earthquake recovery mode, the DSS can then determine the optimal recovery strategy which will show the optimal decision for each building, that is, should it be demolished, restored or upgraded to a higher level of seismic resistance. The latter may be optimal when the expected lifetime cost of repairs from earthquakes is included if the building is especially vulnerable to damage in future earthquake.

The DSS could also be used in a pre-event mitigation mode to determine the optimal upgrading strategy for each building, that is, should the building be structurally upgraded and, if so, what is the optimal level of upgrading.

Given the difficult task of managing earthquake risk with limited resources, this application is, perhaps, the most interesting and powerful use of the DSS. to aid client companies in assessing the cost-benefit trade-offs of how to deal with damaged buildings, seismically deficient buildings, or buildings that might be subject to future damage, both before and after large earthquakes. Given the earthquake threat in the region, the DSS will help the business manager to evaluate the numerous available alternatives that involve both mitigation and recovery over the lifetime of the company's buildings.

Conclusion

Life cycle cost evaluation for mitigation and recovery strategy assessment is something of great interest to business managers in most seismically active areas of the world. Many companies are faced with the decision of what to do with their buildings that have recently been damaged or have the potential to be damaged in future earthquakes. Business managers must make critical decisions about these facilities, and these decisions can impact business operation, corporate profits, life safety of employees, company reputation in society, and many other aspects. The DSS could be a useful software tool to assist companies to make these critical decisions.

Project Manager: James Beck
Project Researchers: A. Kiremidjian, S. Wilkie, S. King, R. Olson, J. Goltz, Y. Achkire, A. Mason, T. Salmon, K. Porter, A. Irfanoglu, M. Casari, J. Legrue, F. Boehmke, A. Gonzales

CUREe Announces 12WCEE Student Travel Awards

At its May 21, 1999 meeting, the CUREe Board of Directors voted unanimously in favor of the creation of a Student Travel Award Program for the 12th World Conference on Earthquake Engineering (12WCEE). As a service to its members, CUREe will pay the airfare for seven students from CUREe member institutions to attend the 12WCEE, which will be held January 30 – February 4, 2000 in Auckland, New Zealand.

Each of the eight member institutions, through their institutional representatives, was asked to supply the name(s) of one eligible student, and one eligible alternate. The following students were chosen: Laurie Gaskins Baise, UC Berkeley, Constantin Christopoulos, UC San Diego, Warrasak Jakrapiyanun, UC San Diego, Sameh Mehanny, Stanford University, Clay Naito, UC Berkeley, Keith Porter, Stanford University, and Randolph Settgast, UC Davis.

This award program represents CUREe's largest student award to date, and is another example of CUREe's commitment to earthquake engineering education. Other events that CUREe has awarded student travel stipends for are: the 6th National Conference on Earthquake Engineering, the 1998 CUREe Annual Meeting, the Northridge Earthquake Research Conference, the Symposium and Banquet to Honor Professor Haresh Shah, and the EERC-CUREe Symposium in Honor of Vitelmo V. Bertero.

CUREe-SEAOC Seminars Update

The CUREe-SEAOC Seminar Series on Structural Engineering, a joint program established by CUREe and SEAOC in 1998, held its final seminar of the 1998-1999 academic school year at UCLA on May 20. This seminar was the fifth in the series, and featured Dr. Gregg Brandow, President of Brandow & Johnston Associates and Professor Anne Kiremidjian, Director of the John Blume Earthquake Engineering Center at Stanford University. The seminar was hosted by Professor Joel Conte of the Department of Civil and Environmental Engineering.

The series is now resuming for the 1999-2000 academic year, and will include new components that result in more customization of the seminars to each school's wishes. The two new modules being introduced for the 1999-2000 seminars are geotechnical engineering and information on the Professional Engineer (P.E.) licensing exam with the presentation on the P.E. exam, given by a representative of the Board of Registration for Professional Engineers and Land Surveyors. These new modules, coupled with the existing practicing engineer and professorial/academic engineer modules, allow the host school to select from two or three modules for their seminar program.

For more information on this seminar series, or if you would like to host a CUREe-SEAOC Seminar Series on Structural Engineering at your school, please contact the CUREe office or your CUREe institutional representative.

President's Column

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CUREe members will receive this same article via e-mail to facilitate and encourage your response. Please take the time to do so! In addition, as noted at the end of this article, others are encouraged to express their views on this topic as well.

In brief summary form, the pros and cons that have been heard to this point from the ad hoc committee, discussions at the Board meeting, and from informal discussions each of the institutional Board members had on their campuses are summarized below.

Why should CUREe consider becoming a national organization?

- CUREe has been successful in managing and organizing national earthquake engineering efforts. CUREe, as a private nonprofit national organization, could seek out and manage other large scale research projects, such as the SAC Steel Project in which it is a partner and the CUREe-Caltech Woodframe Project, and participate more broadly in ensuring the success of the NSF NEES initiative.

- The earthquake engineering university community in the US is presently fragmented. While MCEER, MAE and PEER represent almost 40 US universities, there are many other universities conducting earthquake engineering research that are not part of these centers. There is no single organization that specifically speaks for or addresses the needs of the university-based earthquake engineering community. Most existing organizations appear, in fact, to be shifting their focus further and further away from the university sector, engineering sector, or both.

- CUREe, as a private nonprofit national organization, could seek out and nurture partnerships with international organizations.

- This would clearly delineate the difference between CUREe and PEER.

- The more minds and hands the better.

Why should CUREe remain as a California based organization?

- CUREe, as a smaller, locally focused organization, will be more responsive to member needs.

- There is no need for another national or international earthquake engineering organization, there are already too many.

- Expanding membership by going national may increase total CUREe funding, but may dilute funding to California institutions.

What are your ideas? Send your comments via e-mail to curee@curee.org. They will be forwarded to the CUREe Executive Committee.

1999 CUREe Annual Meeting

The 1999 CUREe Annual Meeting is being planned by UC Berkeley on Friday, November 12 from Noon until 5:00 pm at the Oakland Airport Hilton. Admission is open to all CUREe members and to students from CUREe member institutions. There is no charge, and in addition, CUREe will pay the travel expenses for one student to attend (designated by the institutional representatives) from each of the member universities.

The Annual Meeting will highlight current CUREe projects such as the CUREe–Caltech Woodframe Project, the SAC Steel Project, and the CUREe-Kajima Joint Research Program. There will be presentations by project managers and staff for each of these research programs, as well as a presentation on future research and development of new projects. A special edition of the *CUREe News* distributed at the meeting (and subsequently mailed to our regular mailing list) will feature project reports that mirror the presentations given by project representatives.

The meeting will begin with a luncheon and discussion on the topic of CUREe becoming a national organization (see President's Column), as well a business report.

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CUREe

California Universities for Research in Earthquake Engineering

A nonprofit corporation devoted to the advancement of earthquake engineering research, education and implementation

Organization

Projects

Conferences & Symposia

Publications

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Latest at CUREe Available on Website

The new CUREe website has seen increasing use in the last few months, with over 10 percent of users from overseas destinations. The site features important updates on CUREe research projects, including the SAC Steel Project, CUREe-Caltech Woodframe Project and the CUREe-Kajima Program. The CUREe website is located at http://www.curee.org. Please send comments or suggestions to our webmaster, Carol Cameron, at carol@curee.org.

Annual Meeting

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CUREe members interested in providing feedback are encouraged to attend this discussion.

The steering committee for this year's Annual Meeting was comprised of Professors Armen Der Kiureghian and Gregory Fenves of UC Berkeley. If you are interested in attending the meeting, please RSVP to the CUREe office by e-mail (curee@curee.org) or telephone (510-231-9557). All CUREe members will also receive an invitation in the mail.

CUREe Members Elected to National Academy of Engineering

Three CUREe members, Professors Seible, Iwan and Bertero, were elected to the prestigious National Academy of Engineering in February of this year. UC San Diego Professor Frieder Seible was elected for his contributions to research, development and applications in seismic analysis, and the design, construction and retrofitting of bridges. Professor Seible heads the Testing and Analysis Element of the CUREe-Caltech Woodframe Project. Professor Seible also recently appeared on another prestigious list, the "125 Top People" in the engineering and construction field over the last 125 years, which was produced by *Engineering News-Record* (August 30, 1999, vol. 243, no. 9). Along with Professor Seible, CUREe member George Housner appears in this select group.

Prof. Wilfred Iwan, Director of the Earthquake Engineering Research Laboratory at the California Institute of Technology, was honored for his work on the seismic performance of structures, and for leadership in earthquake hazard mitigation and improvement of public safety. Prof. Iwan is the Caltech Institutional Representative for CUREe.

CUREe member Vitelmo Bertero, Professor Emeritus of Civil and Environmental Engineering at UC Berkeley, was elected as a National Academy of Engineering Foreign Associate for his contributions to improvements in seismic design and construction of steel and reinforced concrete structures.

Publications

The *Proceedings of the PRC-USA Bilateral Workshop on Seismic Codes* is now available. The 307-page Proceedings contains 26 papers presented at the workshop, which was held December 3-7, 1996 in Guangzhou, China. The workshop was organized on the US side by CUREe under an NSF grant, with Prof. V.V. Bertero as Principal Investigator. Several color photos and a list of participants are also included. To order a copy of the Proceedings, send a check or money order in the amount of $40.00 payable to CUREe to:

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Sorry, credit cards cannot be accepted.

Seismic Events

CUREe Annual Meeting and Board Meeting
Nov. 12th, 1999 at the Oakland Airport Hilton.

New Administrative Assistant at CUREe

Ericka Holmon, our new Administrative Assistant, joined CUREe on May 4, 1999. Ericka offers support for both the CUREe-Caltech Woodframe Project (510-231-5684) and the SAC Steel Project (510-231-9477). She can also be reached via e-mail at ericka@curee.org.

New CUREe Members

The following individuals have been approved as new members of CUREe:

Boris Jeremic	UC Davis
James Moore	USC
Juan Pestana-Nascimento	UC Berkeley
G.G. Schierle	USC

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CUREe's offices are located in the Earthquake Simulator Laboratory Building at the UC Berkeley Richmond Field Station.