COSMOS Accomplishments 2004

Short Course

In November, the Board appointed an ad-hoc committee to develop proposals for expanding COSMOS services to its membership and others in the strong-motion community. Farzad Naeim, Norm Abrahamson, Eduardo Miranda, Carl Stepp and Jim Davis were appointed to the group. Eduardo Miranda has taken the lead role in one of the new service areas, developing a series of short courses on the use of time histories in structural engineering applications. These were to be considered in February Board meeting as background for planning for a major effort to increase COSMOS influence and sustainability through its expanded services.

The COSMOS Senior Advisory Committee and the Board reviewed two draft short courses at their meetings in February. The consensus was that the proposed course outlines were excellent, but an introductory course with broader appeal needed to be developed and introduced first. Eduardo agreed to chair a group effort to develop such a course and his effort has been further benefited by an outstanding peer review group. The resulting outline has been reviewed by the Board and Eduardo will work on finalizing the outline with the latest comments he has received. The next step will be to populate the participation in the course by appropriate experts agreeing to participate and for COSMOS to seek special funding to develop the course. The plan is to make the COSMOS sponsored short course available to a number of professional societies to be provided prior to or after their annual meetings, etc. The registration fee will be reasonable and COSMOS members will either have a free or reduced fee as a benefit for membership. A number of EERI Board members have noted the need for such short courses and provided encouragement to COSMOS to proceed with this effort.

An important portion of the introductory course is aimed at demystifying some of the basics of response history analyses by showing the concepts “by example” by using simple tools available to all structural engineers such as spreadsheets. Attendees will learn how various numerical integration methods can be implemented in spreadsheets. Then through the use of friendly scroll bars, attendees will learn how increasing or decreasing lateral stiffness, lateral strength, stiffness or modifying the hysteretic behavior influences the seismic response of single and multi-degree-of-freedom structures. Examples will make use of instrumented buildings to demonstrate how the basics of response history analyses learned with spreadsheets apply to real buildings. During the course attendees will be shown how they can create their own spreadsheets to carry out analyses that are done by “black boxes”. Attendees would also receive a copy of all spreadsheets shown during the course so they walk out not only with new basic knowledge but also with new tools and skills.

The course has two basic objectives:

1. Attract as many engineers as possible;
2. Provide knowledge and tools that will facilitate the use of time histories in engineering analysis.

Attendees will receive lecture notes as well as a CD containing various spreadsheets to conduct linear and nonlinear response history analyses of single-degree-of-freedom systems and modal response history analyses of multi-degree-of-freedom systems.