ASCE/SEI Technical Committee on
Optimal Structural Design

Minutes of Meeting
Renaissance Nashville Hotel
Nashville, TN
May 23, 2004

Those in attendance at the meeting were (in alphabetical order):

- Arzhang Alimoradi, The University of Memphis (Visitor)
- Jasbir Arora, University of Iowa (Friend)
- M. Asghar Bhatti, University of Iowa (Control Member)
- Scott Burns, University of Illinois at Urbana-Champaign (Control Member)
- Christopher M. Foley, Marquette University (Control Member and Assoc. Editor)
- Dan Frangopol, University of Colorado (Member)
- Hitoshi Furuta, Kansai University (Member)
- Don Grierson, University of Waterloo (Past Chair, Visitor)
- Min Liu, University of Colorado (Visitor)
- Warren Lucas, Brigham Young University (Member)
- Ali Memari, Penn State University (Member)
- Keith Mueller (Member)
- Shahram Pezeshk, The University of Memphis (Member and Chair)
- Colby Swan, University of Iowa (Friend)
- Lisa Wang, California State Polytechnic University, Pomona (Member)

1. CALL TO ORDER. The meeting was called to order at 9:00 AM. Those in attendance briefly introduced themselves.

2. REVIEW AND UPDATE OF THE COMMITTEE ROSTER.
   - M. Asghar Bhatti's term is expiring. He will join the committee as a friend.
   - COL Allen Estes's term is expiring.

   There will be open positions for control members. Shahram requested nominations for new control members.

   The current OSD Committee roster is attached with these minutes.

3. APPROVAL OF MINUTES. The minutes of the 2003 meeting of the OSD Committee is Seattle, WA, were approved without any changes. There was no old business arising from these minutes.

4. OSD SESSIONS SPONSORED AT THE 2004 STRUCTURES CONGRESS. The committee has sponsored three technical sessions in Nashville:

    a. "Application of Automated and Optimized Design of Structural Elements and Systems for Performance," organized by Christopher Foley. The session has five papers.
    b. "Soft Computing Potentials in Structural Optimization Practice- Recent Applications," organized by Shahram Pezeshk. The session has four papers.
    c. "Economy is Steel Design," organized by Keith Mueller. The session has four papers.
    d. Dan Frangopol asked to have his session, "Life Cycle Design is More Than Minimum Costing" added to the list of sessions proposed by the committee.

    The OSD Committee proposed and organized a total of 4 sessions at the Nashville Congress.

5. OSD SPONSORED SESSIONS AT THE 2005 STRUCTURES CONGRESS. The following sessions have been proposed to the 2005 congress in New York:

    a. "Optimal Structural Design for Practicing Engineers: Tools and Methods Currently Available" by Keith Mueller and Warren Lucas
    b. "Life-Cycle Design and Management of Infrastructure" by A. Estes
    c. "U.S.-Japan Joint Session on Bridge Management Using Optimization Techniques" by Hitoshi Furuta
    d. "Multiple-Solution Optimization of Structural Systems: Providing Balance and Decision Opportunity" by Warren Lucas
    e. "Computer Intelligence and Natural Systems Algorithms in Structural Engineering" by Christopher M. Foley, William Bulleit, and Shahram Pezeshk. This session is "co-proposed" with the Emerging Computing Technical Committee of SEI.

    There was some confusion with regards to the process of submitting session proposals to the 2005 Congress in New York. Many members of the committee have not yet received confirmation of any sort regarding their submissions.

    There was concern expressed with the manner in which the Congress web-site was set up for submissions. There was no clear way for an individual to propose a "session" for the Congress. The web-site appeared to only accept "paper submissions."

    Dan Frangopol felt that the "multiple-solution" session may be a very interesting session for practicing engineers.

Shahram Pezeshk expressed his interest about the tools and methods session.

U.S.-Japan session was originally proposed by Prof. Furuta, although he is not sure if the session will be approved or not.

Colby Swan and Jasbir Arora will be organizing a workshop before the New York congress in 2005.

6. OSD SPONSORED SESSIONS AT THE 2006 STRUCTURES CONGRESS IN ST. LOUIS.

Dan Frangopol suggested that the Committee wait to see which sessions are approved for the New York congress and decide what to propose and expand upon for the St. Louis Congress.

Arzhang Alimoradi suggested contacting the Mid-America Earthquake center to find possible interests within the consequence minimization trust area for possible contributions.

Warren Lucas and Shahram Pezeshk expressed that structural engineers shall be encouraged to apply optimization tools and methodologies in their projects.

7. SPECIAL PROJECT(S):

Short Course on Structural Optimization
The Committee discussed organizing a short course on "Structural Optimization" by Professor Arora.

It was felt that any short-course should address two issues:
    a. Structural engineers usually use commercial analysis/design software packages;
    b. The software system has to be user friendly with graphical interfaces

Keith Mueller briefly explained CIS-2. This neutral file-format can be used by different software systems to define geometry, facilitate analysis/design, speed fabrication, aid to orchestrate delivery of materials to the jobsite, and speed erection of steel structural systems.

Asghar Bhatti: ANSYS has a capable optimization module that is not being used widely by structural engineers. Optimization in ANSYS can be demonstrated in the workshop.

Arzhang Alimoradi: Optimization and GA toolboxes of MATLAB can also be used with FEMLAB in solving optimization problems of finite element technology.

Keith Mueller: RamSteel can be demonstrated in the workshop. Ram has adopted CIS-2, therefore it's possible to tie it in with some optimization routines.

Lisa Wang: Software and applications are not the major issues. Structural engineers need to be educated about the concepts of optimal design.

Workshop for 2006 Structures Congress

A workshop was tentatively agreed upon for the 2006 Congress in St. Louis. The tentative title for the workshop is "Existing Tools for Structural Optimization in Practice." Asghar Bhatti and Shahram Pezeshk will take responsibility for the workshop program. It was felt that Professional Development Hours (PDH's) should be offered to the participants in the workshop. It is hoped that this will facilitate the attendance of practicing engineers.

The Committee discussed two major points regarding the Workshop:

- Should the participants be charged for the workshop?
- Should the workshop provide enough computers in the congress venue for hands-on experience?

Shahram Pezeshk: What would be some possible topics that could be presented in the workshop?

- Analytical concepts and formulation
- Strength optimization
- Seismic response optimization
- Base isolation
- Multiobjective optimization

Dan Frangopol: In using commercial software care shall be taken so that no software system would be commercialized or be encouraged by the workshop to use.

Shahram Pezeshk: St. Louis congress is perhaps too early for the workshop. We will continue with planning for 2006 but the final decision will be made next year in New York.

Shahram Pezeshk and Scott Burns: It seems that CIS-2 would be a very appropriate vehicle to implement various optimization techniques on different analysis software. Gab Coleman at AISC will be contacted for more information.

Scott Burns: CIS-2 can very well bring together the structural engineers by providing a uniform format that can be used in their projects and for optimization.

Shahram Pezeshk: Tying OpenSees with the CIS-2 file format may be an interesting project.

8. NEW DIRECTIONS OR INITIATIVES FOR THE OSD COMMITTEE

The Chair asked if the members of the committee would be interested in putting together a special publication on "Performance-Based Optimal Design"?

Shahram Pezeshk: The introductory article that Chris Foley wrote about Performance-Based Optimal Design can be updated as an introduction for the special publication.

Shahram Pezeshk: What possible topics would be covered in the special publication?

Asghar Bhatti: We can collect our recent Structures Congress sessions in a chapter.

Colby Swan: Instead of having special publication, maybe committee members contribute their research findings in a special issue in the Journal of Structural Engineering.

Dan Frangopol: Either a special publication or a journal special issue would be appropriate, as each one has its own merits.

Warren Lucas: Special publication articles are also peer-reviewed, therefore there should be no problem for people receiving credit on their contribution.

Colby Swan: Journal articles are usually more visible, considering the electronic downloads.

Chris Foley: A special issue will likely require 10 to 15 papers in the Journal.

9. ASSOCIATE EDITOR'S REPORT:
Chris Foley provided and update of manuscript activity in the Journal of Structural Engineering. The following summary of the OSD-AE's activities during the previous year (May 2003 through May 2004) was provided:

Total Manuscripts Handled:	26	
Revised Manuscripts Handled:	4	1 – Approved with revisions;
		1 – Tentatively approved
		1 – Approved
		1 – Declined
Discussions Handled:	1	Approved with re-review Approved with revisions recommended.
Closures Handled:	1	Approved with recommended revisions.
New Submissions Handled:	9	3 – Decline

3 – Approve with Final Decision Deferred
3 – Approve with E-Board Review

Manuscripts Currently Under Review   11

10. OTHER BUSINESS:
Chris Foley provided an update regarding the OSD Committee web-site. The web site is currently house on the Marquette University college of engineering web-server and is linked through the ASCE/SEI web page.

11. ADJOURNMENT.
The meeting was adjourned at 11:40 AM, following which all were invited to reconvene at 12:00 PM for lunch in downtown Nashville.

Submitted;

Arzhang Alimoradi
Christopher M. Foley (Secretary)
Optimal Structural Design Committee of ASCE/SEI
June 9, 2004