

SEI/ASCE Technical Committee on Optimal Structural Design

Minutes of Meeting The Westin Hotel, Seattle, Washington 30 May 2003

Those in attendance at the meeting were, in alphabetical order:

- M. Asghar Bhatti, University of Iowa (member)
- Scott Burns, University of Illinois (friend of the committee)
- Allen Estes, U.S. Military Academy West Point, (member)
- Chris Foley, Marquette University (member and JSE Associated Ed.)
- Dan Frangopol, University of Colorado (friend of committee)
- Hitoshi Furuta, Kansai University (member)
- Don Grierson, University of Waterloo (member and past-chair)
- Mircea Iordanescu, Hydro-Quebec (IREQ) (member)
- Warren Lucas, Brigham Young University (member)
- Ali Memari, Penn State University (member)
- Keith Mueller, American Institute of Steel Construction (member)
- Shahram Pezeshk, University of Memphis (member and chair)
- Salam Rahmatalla, University of Iowa (visitor)
- Colby Swan, University of Iowa (member and secretary)
- Lisa Wang, California State Polytechnic University, Pomona (member)
- Akram Youssef, Weidlinger Associates (visitor)

1. **CALL TO ORDER.** The meeting was called to order at 7:30pm and those in attendance briefly introduced themselves.

During the introductions, Mircea Iordanescu invited the committee and members to consider getting involved in the field of designing Electrical Transmission Structures in which there appear to be considerable opportunities for structural optimization.

2. **REVIEW AND UPDATE OF THE COMMITTEE'S MEMBERSHIP LIST.** All changes described below take effect 1 October 2003.

- Chun-Man Chan's 6-yr term expires, and he becomes a friend of the committee
- Dan Frangopol rejoins the committee as a member with a 3-yr term expiring in 2006.
- Hitoshi Furuta receives a 1-yr extension, his 1st.

- Don Grierson receives a 1-yr extension, his 3rd
 - Santiago Hernandez's 6-yr term expires, and he becomes a friend of the committee
 - Ali Memari receives a 1-yr extension, his 1st
 - Makoto Ohsaki receives a 1-yr extension, his 2nd
 - Colby Swan's 6-yr term expires, and he becomes a friend of the committee
 - Lisa Wang receives a 1-yr extension, her 1st
 - Lei Xu's 6-yr term expires, and he becomes a friend of the committee
3. APPROVAL OF MINUTES. The minutes of the 2002 Denver, CO meeting of the OSD committee were approved without change, and there was no old business arising from these minutes.
4. OSD SESSIONS SPONSORED AT THE 2003 STRUCTURES CONGRESS.

The committee sponsored two and one half technical sessions in Seattle:

- a) "Performance-based Design Optimization" was organized by Chris Foley and Shahram Pezeshk and had four presentations;
- b) "Optimal Conceptual Design of Engineered Structures" was organized by Don Grierson and had five presentations; and
- c) "Life-Cycle Cost Design, Evaluation, and Maintenance of Deteriorating Structures" was organized by Dan Frangopol and had three presentations.

In discussing these sessions it was noted that the scheduling of sessions at this congress was unfavorable for many of the Analysis & Computation technical committees. For example, sessions of these committees were scheduled simultaneously, and some overlapped with meetings of the sponsoring committees. This was perceived as having a negative impact on attendance at the technical sessions sponsored by the A&C committees.

5. OSD SPONSORED SESSIONS AT THE 2004 STRUCTURES CONGRESS:

The following sessions have been accepted for the 2004 Congress in Nashville:

- a) "Performance-based design optimization of structures" by Shahram Pezeshk and Chris Foley;
- b) "Economy in steel design" by Scott Burns.

6. SESSION PROPOSALS FOR THE 2005 STRUCTURES CONGRESS IN NYC:

- a) Warren Lucas will develop a session proposal on "Optimal Structural Design for Practicing Structural Engineers."

b) Don Grierson will develop a session on “Design and Analysis of Structures Under Abnormal Loadings.”

7. ASSOCIATE EDITOR’S REPORT: Chris Foley, OSD’s Associate Editor for the Journal of Structural Engineering (JSE) reported that during the period of 1 October 2002 through May 2003 he received ten manuscripts related to structural optimization for review:

Papers received for review:	10
Papers acted upon:	10
Papers accepted for publication:	4
Papers rejected or returned for revision:	6

8. OSD WEBSITE REPORT:

Chris Foley, as the member in charge of OSD’s web pages, expressed some frustration that OSD has been unable to gain control over its webpage that is linked to the ASCE/SEI website.

Following the meeting, ASCE/SEI staff disclosed that ASCE’s new policy is to give all technical committees complete control of their web pages. Sue Richardson at ASCE can be contacted to address further website issues: suerichardson@asce.org.

9. REPORT ON OSD’S SPECIAL PROJECT PROPOSAL

Don Grierson reported on the proposed special project he is organizing: “*Structural Integrity of New Building Design Proposed for WTC Site*”. He reported that the Executive Committee for all TACs is out of funds for this fiscal year thus unable to fund the special project at this time.

It was noted that the TAC for OSD has an allocation of \$5k for this fiscal year to fund special publications.

Dan Frangopol recommended that OSD request a special allocation of \$5k in its next fiscal year budget to further pursue this special project.

10. NEW DIRECTIONS OR NEW INITIATIVES FOR THE OSD COMMITTEE

Group discussion took place on a recurring theme for the OSD Committee, namely how to facilitate usage of design optimization in structural engineering practice. Following are brief summaries of selective comments made those present:

Memari: It would be helpful to try to determine the existing usage of design optimization in structural engineering practice.

Youssef: A real barrier to practitioners using design optimization is the lack of software products for structural engineers that perform design optimization.

Iordanescu: Notes that there are indeed some existing structural optimization software packages. Further notes that structural optimization software needs to be made very specific to definite types of structural design problems, rather than being overly general.

Frangopol: Noted that in Mechanical Engineering, there is a real niche for design optimization that has been filled by Vanderplaats' DOC/DOT software.

Memari: Suggested that it might be helpful to recast the AISC/ACI/AASHTO structural design codes in terms of optimization, rather than just specifying that designs must satisfy an extensive list of constraints.

Grierson: Posed a question on whether increasing performance-based design requirements might not actually make design optimization a necessary tool rather than an optional tool that designers can do without.

Estes: Noted that the Corps of Engineers is being increasingly forced to do reliability analysis and design due to federal government requirements.

Frangopol: Stated that life-cycle cost minimization (rather than first cost minimization) is increasingly a goal in transportation structures.

Grierson: It would be helpful to identify those structural design problems where optimization is absolutely necessary.

Frangopol: Optimization is currently needed and used in design of bridge maintenance operations.

Memari: Designers of pre-fabricated structural systems might find design optimization vital due to the potential economies that could be realized with mass-produced systems.

Youssef: Design-build contracts might give greater incentive to structural engineers to use optimization, since the gains realized from economization would be realized by their firm.

Bhatti: Noted a lack of undergraduate level structural design texts that even mention optimization.

11. Adjournment.

Following the discussion above, the meeting was adjourned at 9:20pm, following which all were invited to reconvene at 9:30pm for dinner and drinks at Cutter's Seafood Restaurant in Seattle.

These notes prepared and submitted by

Colby C. Swan
OSD Committee Secretary
10 June 2003