

SEI/ASCE Technical Committee on Optimal Structural Design

Minutes of Meeting Washington, D.C. 22 May 2001

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

- Jasbir Arora, University of Iowa, (friend of committee)
- Baidurya Bhattacharya, University of Delaware, (visitor)
- Scott Burns, University of Illinois, (member)
- Al Estes, U.S. Military Academy, West Point, (member)
- Chris Foley, Marquette University, (member)
- Dan Frangopol, University of Colorado, (member and past-chair)
- Hitoshi Furuta, Kansai University, (member)
- Don Grierson, University of Waterloo (member and chair)
- Siavash Khajehpour, Kinetrics, Inc., (visitor)
- Ali Memari, Penn State University, (member)
- Keith Mueller, American Institute of Steel Construction, (visitor)
- Shahram Pezeshk, University of Memphis, (friend)
- Colby Swan, University of Iowa, (member and secretary)
- Lisa Wang, California State Polytechnic University, Pomona, (member)

- 1) Call to order. The meeting was called to order at 2:35pm and all in attendance briefly introduced themselves.
- 2) Review and update of the committee's membership list.
 - a) The following are still in their first 3-year membership terms and have at least 1-year remaining: Christopher Foley, Hitoshi Furuta, Ali Memari, Makoto Ohsaki, and Lisa Wang.
 - b) The following have come to the end of their normal membership terms, and will become friends of the committee, upon request: Mircea Iordanescu, and Subramaniam Rajan.

- c) The following are in their 2nd 3-year terms and were given 1-year extensions: Scott Burns, Allen Estes, Dan Frangopol, Don Grierson, Santiago Hernandez, Colby Swan, Kevin Truman, Asghar Bhatti, Chun-Man Chan, and Lei Xu.
- d) Those friends of the committee who have been not been members for at least two years, and who are still interested in pursuing the committee's interests and activities were encouraged to become members once again (Jasbir Arora, Rick Balling, Franklin Cheng, Shahram Pezeshk, and perhaps others).
- e) Keith Mueller and Siavash Khajepour were invited to apply for membership to the OSD committee. Professors Arora and Pezeshk expressed an interest to rejoin the committee.
- f) At the request of Scott Burns, Don Grierson briefly reviewed the expectations and responsibilities of OSD committee members:
 - i) Active involvement in research, usage, or dissemination of structural optimization.
 - ii) Willingness to peer review articles submitted for publication to the Journal of Structural Engineering, when the topic is related to one's field of expertise.
 - iii) Develop and/or contribute to technical sessions at Structures Congresses.
 - iv) Participate in special group projects and/or the writing of special publications undertaken by the committee.
 - v) Attempt to attend the annual meetings.
- 3) The minutes of the previous meeting of the OSD committee were approved without change, and there was no old business arising from these minutes.
- 4) Report on OSD activities from May 2000 through May 2001.
 - a) Dan Frangopol and Hitoshi Furuta have authored and edited a new special ASCE publication entitled "Lifecycle cost, safety and design of civil infrastructure systems."
 - b) Shahram Pezeshk reported on his editorial activities with the *Journal of Structural Engineering*:
 - i) 30 papers pertaining to structural optimization were submitted to the journal from May 2000 through April 2001.

- ii) During this one-year period, there was a 27% acceptance rate for these 30 papers. The overall acceptance rate for articles submitted to the Journal of Structural Engineering during this time period was approximately 45%.
 - iii) Shahram recognized Christopher Foley for his excellent service as a very thorough and punctual reviewer of research manuscripts for the journal, and presented him with an honorary plaque. Shahram suggested that ASCE should consider institutionalizing such awards for excellent reviewing.
 - iv) Shahram noted in relation to all 62 of ASCE's technical journals, the Journal of Structural Engineering has the 11th highest impact factor in terms of reading audience and citations by other authors.
 - v) Jasbir Arora commented that since OSD committee members tend to be fairly strict in their review of articles, they might want to consider recommending more of the articles they review for potential "best-paper" awards.
- 5) Report on session sponsored at 2001 Structures Congress.
- a) "Life-cycle, safety, and cost-management" was co-organized by Dan Frangopol and Hitoshi Furuta. There were six papers presented in this session, and all were nicely integrated with the session's theme. Dan noted that with six speakers, there was very little time for discussion and questions in the session. He further noted that computer support for electronic presentations could be improved in subsequent congresses.
 - b) "Computational methods for conceptual design of structures" was co-organized by Don Grierson and Colby Swan. There were four papers presented in this session that was well attended. This may be due in part to the very favorable scheduling of the session (1st technical session on 1st day of congress). With only four speakers, there was plenty of time for questions and discussion.
- 6) Approved OSD-sponsored sessions for the 2002 Structures Congress in Denver.
- a) "Computational methods for performance-based design" by Don Grierson.
 - b) "Practical design using genetic algorithms" by Hitoshi Furuta.
 - c) "Lifetime structural performance and maintenance" by Dan Frangopol.
- 7) Report on 15th Conference on Analysis and Computations, Denver 2002.
- Jasbir Arora, as past-chair of the Analysis and Computations (A&C) Committee, noted that in Denver only four papers (max) would be permitted per session.
 - There will be 14 A&C sessions at the Denver Congress.
 - He also noted that those session proposals that are well planned with identified speakers and titles are usually approved for development.

- 8) Report by Dan Frangopol from the Executive Committee of SEI's Technical Activities Division.
 - a) Benson Shing, the new chair of the A&C Committee has approved a special publication of the 56 papers that will comprise the A&C track in Denver.
 - b) There was discussion among the OSD committee on an appropriate form for dissemination of the Denver conference papers. It was noted that there will not necessarily be a coherent theme unifying all of the papers, and thus a special ASCE publication may not be suitable. In addition, there was a consensus among those present that there should not be a surcharge in the conference registration fee to cover the cost of this special publication. As a result of this discussion, the OSD Committee recommends that the peer-reviewed 8-page papers from the A&C track in Denver be included in the proceedings which will be distributed on compact disks (CD's), and that there be no special hardcopy publication.
 - c) The Executive Committee has established a new committee to oversee the organization and site selection of future structures congresses.
 - d) The Executive Committee is quite pleased with the activities of the OSD committee.
 - e) The Executive Committee is hoping to develop a more open and democratic process for nominating and selecting their membership. Jasbir Arora is the current nominee for membership on the Executive Committee, representing the Analysis and Computations Committees.

- 9) Report by Scott Burns on the "State-of-the-Art" publication by OSD.
 - a) The following chapters/sections were discussed:
 - i) The contribution by Chris Foley on "Optimization and Performance-Based Design." Chris noted that this field is one that is still developing, and that there is not yet a clear consensus on what "performance-based design" actually means. He solicited input/discussion from the committee and Don Grierson, Shahram Pezeshk, Dan Frangopol volunteered to further communicate with Chris on this subject.
 - ii) The contribution by Dan Frangopol and Allen Estes has not yet been submitted, but Dan and Allen agreed to submit it no later than 1 July 2001.
 - iii) The contribution by Chun-Man Chan on "Tall Buildings" has not been submitted and will be dropped from the publication.

- iv) The contribution by Santiago Hernandez on “Aeroelastic Bridge Design” was not submitted, and will be dropped unless special arrangements are made in the near term.

 - b) Members of the committee agreed to review contributions as listed below, with all reviews due to Scott Burns by 1 July 2001.
 - Chapter 1, Don Grierson and Xu Lei.
 - Chapter 2, Jasbir Arora and Colby Swan.
 - Chapter 3, Scott Burns and Siavash Khajehpour.
 - Chapter 4, Al Estes.
 - Chapter 5, Al Estes.
 - Chapter 6, Chris Foley and Colby Swan.
 - Chapter 7, Chris Foley.
 - Chapter 8, Don Grierson and Shahram Pezeshk.
 - Chapter 9, Siavash Khajehpour, Ali Memari, and Lisa Wang.
 - Chapter 10, Hitoshi Furuta.

 - c) All authors are also encouraged to submit a list of keywords to Scott Burns by July 1st.
- 10) Session Proposals for the 2003 Structures Congress in Seattle.
- a) The rough timeline for development of the following session proposals is as follows: by August 1st submit to Don Grierson, who will then submit them to Benson Shing by September 1st, and he will then pass them on to the organizing committee by October 1st.

 - b) The following session proposals were discussed for sponsorship by OSD:
 - i) “Optimization for nonlinear structural behaviors” by Makoto Ohsaki and Colby Swan
 - ii) “Performance-based design optimization” by Chris Foley and Shahram Pezeshk.
 - iii) “Optimization of lifetime inspection and repair” by Allen Estes and Dan Frangopol.
 - iv) “Tutorial on structural optimization” by Jasbir Arora.
 - v) “Multiple optimal designs” by Scott Burns.
 - vi) “Conceptual design” by Don Grierson.
 - vii) “Tutorial on evolutionary computations and optimal structural design” by Don Grierson.

11) Report on OSD involvement in GECCO-2001.

The Genetic & Evolutionary Computation Conference (GECCO) is to be held July 7-11 in San Francisco. Members of the OSD committee have played a role in organizing this conference.

- Shahram Pezeshk organized a partial track on “Optimal Structural Design” in the conference.
- Scott Burns organized a pre-conference workshop with 3-sessions and 10 papers.
- Don Grierson is scheduled to present a 90-minute tutorial session on ‘optimal structural design using evolutionary computation’.
- Many members of the OSD committee peer-reviewed the submitted conference papers.

12) Future Directions and Other Business of the OSD Committee.

- a) The Structural Engineering World Congress will be held in Yokohama, Japan during October 2002. As part of this congress, Don Grierson and Chun-Man Chan may be developing and conducting a workshop on “Optimal Design of Tall Buildings.”
- b) It was proposed by Don Grierson that the four papers presented in the 2001 Congress session on “Computational methods in conceptual design of structures” be revised and then submitted, through Don, to Hojat Adeli for peer-review and publication in a special issue of the *Journal of Computer-Aided Civil and Infrastructure Engineering*. Don hopes that all four lead authors in the session (himself, Hernandez, Arora, Swan) will commit to this publication (all Call for Papers will also be issued so that other authors may also submit papers for this special journal issue. The revised papers should be submitted to Don by October 1, 2001.
- c) Chris Foley has taken on the responsibility of working with ASCE and SEI to maintain the OSD Committee’s website. In an open discussion of the website, members expressed appreciation for what Chris has done, and suggested that the site could be improved by adding committee members’ e-mail addresses and/or hyperlinks to their individual web pages.

13) Adjournment.

The meeting was adjourned at 5:45pm. Members subsequently reconvened at a downtown venue for continued discussions and dinner.

Submitted respectfully 28 May 2001 by
Colby C. Swan
OSD Committee Secretary