



SEI/ASCE Technical Council on
Life-Cycle Performance, Safety, Reliability and Risk of Structural Systems

Task Group 1 on
Life-Cycle Performance of Structural Systems under Uncertainty

International Workshop on
Life-Cycle Performance of Civil Structure
and Infrastructure Systems

10 November 2015

ASCE Headquarters
American Society of Civil Engineers
1801 Alexander Bell Drive
Reston, VA 20191





Purpose of the Workshop

To fulfill the continuously increasing demand from societal, political, economic and environmental needs, structural engineering is undergoing a profound change towards a life-cycle oriented design philosophy where the classical point-in-time reliability-based design criteria are extended to account for more comprehensive time-variant performance indicators over the entire service life. The recent relevant advances accomplished in the fields of modeling, analysis, design, maintenance and rehabilitation of deteriorating structure and infrastructure systems are perceived to be at the heart of a modern approach to structural engineering. However, a gap has still to be filled between theory and practice before life-cycle concepts can actually be implemented in design of structures and infrastructures.

The research and applications in the field of life-cycle assessment, prediction, and optimal management of structure and infrastructure systems under uncertainty is promoted within the Structural Engineering Institute (SEI) of the American Society of Civil Engineers (ASCE) by the Technical Council (TC) on Life-Cycle Performance, Safety, Reliability and Risk of Structural Systems, Task Group 1 (TG1) on Life-Cycle Performance of Structural Systems under Uncertainty.

The ongoing activities of SEI/ASCE TC TG1 include a Special Project approved by the SEI Technical Activities Division Executive Committee for the development of a state of the art report outlining the current status and research needs to implement life-cycle concepts in engineering practice. The outcome of the project will be an ASCE special publication providing a review of the main life-cycle methodologies and tools and a set of recommendations on how to implement them into design codes and standards in order to support and advance the civil engineering profession.

The first task of the Special Project was to conduct a Survey and organize this Workshop on Life-Cycle Performance of Civil Structure and Infrastructure Systems. The Workshop program includes invited plenary lectures addressing the current state of research and practice, as well as breakout working sessions and group reports. The goal is to assemble information from researchers and experts involved in the development and the implementation of criteria, methods and tools for life-cycle design and assessment of civil structure and infrastructure systems. The results of both Survey and Workshop will complement information on the state of research and practice that will be summarized in the SEI/ASCE TC TG1 special publication.

We sincerely hope that this effort will contribute to promote the application of life-cycle concepts in design practice, influence the development of structural design codes and standards, and enhance the state of the civil structures and infrastructures to protect the public safety and improve the quality of life.

Fabio BIONDINI, M.ASCE, Past-Chair of TG1 & Dan M. FRANGOPOL, Dist. M. ASCE, Chair of the TC

Technical Program

8:00 – 8:45 am	Registration & Breakfast
8:45 – 9:30 am	Opening Session
8:45 – 9:00 am	Welcome, Workshop Background and Objectives Fabio Biondini & Dan M. Frangopol
9:00 – 9:10 am	Background and Objectives of SEI/ASCE Technical Council Dan M. Frangopol, Lehigh University, USA
9:00 – 9:10 am	Probability Concepts in Life-Cycle Civil Engineering Alfredo H.-S. Ang, University of California at Irvine, USA
9:20 – 9:30 am	Survey on Life-Cycle of Civil Structure and Infrastructure Systems Fabio Biondini, Politecnico di Milano, Italy



9:30 – 11:00 am	State of Research
9:30 – 9:50 am	Aging and Deterioration of Structural Systems Bruce R. Ellingwood, Colorado State University, USA
09:50 – 10:10 am	Life-Cycle Structural Performance Indicators Michel Ghosn, New York City College, USA
10:10 – 10:30 am	Maintenance of Structures and Infrastructures Mauricio Sanchez-Silva, University of Los Andes, Colombia
10:30 – 11:00 am	Discussion Moderator: Fabio Biondini, Politecnico di Milano, Italy
11:00 – 11:20 am	Coffee Break
11:20 – 12:50 am	State of Practice
11:20 – 11:40 am	Sustainability of Buildings and Large Structures Mark Sarkisian, Skidmore, Owings & Merrill (SOM), USA
11:40 – 12:00 pm	Life-Cycle of Bridges and Infrastructures Adam Matteo, Virginia Department of Transportation, USA
12:00 – 12:20 pm	ASCE's Grand Challenge of Reducing Life-Cycle Costs Terry Neimeyer, KCI Technologies, USA
12:20 – 12:50 pm	Discussion Moderator: Terry Neimeyer, KCI Technologies, USA
12:50 – 1:00 pm	Preparation of Breakout Groups
1:00 – 2:00 pm	Lunch
2:00 – 3:00 pm	Breakout Sessions
	Session 1: State of Research – Aging and Deterioration Moderator: Mitsuyoshi Akiyama, Waseda University, Japan
	Session 2: State of Research – Performance and Maintenance Moderator: Sofia Diniz, University of Minas Gerais, Brazil
	Session 3: State of Practice Moderator: Mark Sarkisian, Skidmore, Owings & Merrill (SOM), USA
3:00 – 3:20 pm	Coffee Break
3:20 – 4:20 pm	Group Reports
3:20 – 3:40 pm	State of Research – Aging and Deterioration Mitsuyoshi Akiyama, Waseda University, Japan
3:40 – 4:00 pm	State of Research – Performance and Maintenance Sofia Diniz, University of Minas Gerais, Brazil
4:00 – 4:20 pm	State of Practice Mark Sarkisian, Skidmore, Owings & Merrill (SOM), USA
4:20 – 4:30 pm	Closing Session



Webpage of the SEI/ASCE Technical Council:

<http://www.asce.org/templates/membership-communities-committee-detail.aspx?committeeid=000000928331>

Webpage of the SEI/ASCE TC Task Group 1:

<http://www.asce.org/templates/membership-communities-committee-detail.aspx?committeeid=000000928407>