

# **MINI-SYMPOSIUM – COMPDYN2011**

## **RELIABILITY OF STRUCTURAL AND MECHANICAL SYSTEMS FOR UNCERTAIN OPERATING CONDITIONS**

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### **ABSTRACT**

It has been recognized in several engineering disciplines such as earthquake, offshore, aeronautical, mechanical, and wind engineering that the assumption of deterministic models for analysis may lead to unsafe designs, as the performance of the system clearly exhibits considerable variability. Hence, uncertainty in the environmental loads and in the structural modeling needs to be taken into account explicitly, as it may cause significant changes in the reliability of structural and mechanical systems. The application of procedures for analysis and design which explicitly quantify uncertainty ensures that the system being analyzed and designed will perform within prescribed margins of reliability.

This mini-symposium focuses on methods for quantifying, analyzing and enhancing the reliability of structural systems and mechanical components under uncertain operating conditions. The uncertainty involved in the problem might be quantified using for example Bayesian probability, imprecise probability, fuzzy sets, interval arithmetic, or possibilistic analysis. Papers that address either methodological developments or novel applications in topics related to reliability analysis of structural and mechanical systems under uncertain operating environments are welcomed for presentation in the session. Specific topics such as reliability estimation, simulation techniques, uncertainty quantification, reliability-based design optimization, uncertainty propagation, robust design, etc. and their application in areas such as earthquake engineering, offshore engineering, fracture mechanics, aeronautical engineering, structural mechanics, and wind engineering are appropriate for this mini-symposium.