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LECTURE ANNOUNCEMENT

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Dependability of Complex Structural Systems

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Abstract

The conception and the design of a complex structural system is the result of a series of strategic interactions and of multi-disciplinary cooperation. Moreover, in such systems, several sources of uncertainties are present that have to be accounted in the design process: uncertainties in the mechanical and geometrical properties, in the material constitutive equations and structural response, in the human reasoning, etc. This presentation focuses on the concept of dependability and the consequent methodology. Dependability is concisely defined as the grade of confidence on the safety and on the performance of a system. This is a qualitative definition that comprehensively accounts for several properties, which, even though interconnected, can be examined separately. Adapting the conceptual organization scheme conceived for the electronic and systems engineering field in the structural engineering field, dependability can be illustrated by dividing it in three different conceptual groups. The first group deals with the properties that a dependable structure should possess commonly referred as dependability attributes. The second group concerns the external or internal threats that can harm the dependability level of the structure. Finally, the third group includes the dependability means, i.e. the strategies and methods that can be followed in order to achieve and maintain a dependable system. In all cases, applications to structural examples are illustrated.

Short Biographical Note of the Speaker

Born 1963. Military duty made in 1989. Degree in Civil Engineering (1988) and Ph.D. in Structural Engineering (1993) at the Politecnico di Milano. Registered PE since 1988. Full Professor of Structural Analysis and Design at the School of Engineering of the University of Rome "La Sapienza" since 2000. Courses presently taught: Structural Analysis and Design, Steel Constructions, Fire Structural Design. Invited Professor at the Master School “F.lli Pesenti” at the Politecnico di Milano since 1989. Visiting Professor at Harbin Institute of Technology (China), Visiting Assistant Professor at University of Illinois at Urbana-Champaign in 1997. Research period at Technische Universitaet Karlsruhe and Technische Universitaet Munich. Research activity: more than 200 scientific papers on the analysis and design of structures: safety and reliability, computational mechanics, nonlinear mechanics, stochastic mechanics, structural dynamics, identification, optimization and control. Member of scientific committee and chairman in international and national conferences. Member of: American Concrete Institute (ACI), International Association of Bridge and Structural Engineering (IABSE), International Association for Spatial Structures (IASS), European Association for Structural Control (EASC), International Association for Bridge Maintenance and Safety (IABMAS), Precast/Prestressed Concrete Institute(PCI), IEEE Computer Society, American Society of Civil Engineers (ASCE), International Association for Life-Cycle Civil Engineering (IALCCE), Association for Computing Machinery (ACM). Member of the National Commission for Italian Code of Constructions. Expert Member of the “Consiglio Superiore dei Lavori Pubblici” (Higher Council of Public Works) of the Italian Ministry of Infrastructure and Transportation. Member of the Scientific Committee for the Messina Strait Bridge. Consultant for bridges, tall buildings, special structures, forensic engineering.□

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