

Risk management in civil engineering

advanced course

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MANAGEMENT OF STRUCTURAL RISKS

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Abstract

Over the last 2-3 decades methods of risk and reliability analysis have gained increasing importance in society. The demand for sound, rational and risk decisions in industry is increasing due to the increased competition in the globalized market a rising public awareness of issues related to the safeguarding of people and environmental qualities. Society in general is under the pressure of decreasing availability of non-recyclable natural resources, increasing complexity of societal infrastructure and the ever reducing availability of arable and habitable land. In addition the new moral setting of sustainable societal developments put focus on a careful consideration of available resources and demands for both the present and future generations to maintain and improve standards of living. The lectures aim to outline the problem complex of decision making in engineering subject to uncertainty. A basic outline is provided on the interpretation of uncertainty and the interpretation of probability. With this prerequisite a framework for risk assessment of engineering systems is outlined taking basis in recent achievements of the joint Committee on Structural Safety (JCSS). Thereafter an introduction is given on the methods of structural reliability theory. Finally, illustrative examples and cases are provided on the application of risk and safety analysis in engineering including the assessment of robustness of structures and risk management of risks due to natural hazards.