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IGT-Kolloquium

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Learning from Failures: From Conventional Applications to Complex Engineering Projects

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10 - 12 am, ETH Zurich, Hönggerberg, HIL E7

The concept of failure is central to design in civil engineering. It is by thinking in terms of obviating failure that engineering methods of analysis have been devised and successful designs achieved.

In seismic geotechnical engineering in particular, post-earthquake observations of performance have largely shaped the profession and prompted scientific research.

This presentation brings together an ensemble from events inspired by the design process of actual projects during the past 5 years in order to demonstrate that geotechnical failure is imminent in all types of projects: from conventional "next-door" applications such as excavating for a new beach-house to the most advanced ones such as 10km deep subsea digging for oil extraction. The lecture structure attempts to cover –for each case study– the description of the project, the history of the failure and its consequences, forensic analysis to identify the causes and finally, presentation of the solution.

It will be shown that the roots of geotechnical failures range from common engineering or contractor's misjudgment, to technological flaws that could not be predicted beforehand. The main conclusion could be thought of as a sort of warning and a challenge for the younger generation of geotechnical engineers: unlike several civil engineering applications, our domain remains largely uncovered by codes and regulations and dependent upon the engineer's judgment.

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PROFILE

Dr. Rallis Kourkoulis is a founding partner of Grid-Engineers, an interdisciplinary engineering consulting firm based in Athens, Greece and working internationally to provide resilient-design solutions combining advanced civil engineering knowledge with IT. As an expert consultant in geotechnical earthquake engineering, he specializes in numerical modeling of foundation–structure systems subjected to seismic shaking and ground deformation, risk mitigation and analysis, resilience-based design and lately offshore geotechnics. Since 2012 he holds the position of the Technical Director for numerical analyses of the Soil Mechanics lab at the National Technical University of Athens (Greece). As a researcher, he has authored 19 Journal publications and 50 conference papers, he has worked in several International research projects and has been actively supervising graduate students at NTUA.