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IGT-Kolloquium

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The Role of Geohazard Characterization in Minimizing Risk at Engineered Facilities

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

All engineered structures are exposed to natural hazards (e.g. earthquakes, geotechnical, wind, waves, currents, floods) and must be designed so that the structures will perform satisfactorily should a hazard event occur. To achieve this performance objective the hazards and vulnerabilities associated with a given project must be sufficiently understood such that the risk to owners, stakeholders, the public, and the environment are minimized, mitigated, or avoided. The risk to a project due to a hazard event (the risk event) is the product of two factors:

P (Risk Event) = P (Hazard) x P (Facility Damage|Hazard)

where: P (Hazard) is the annual probability of a hazard event occurring; and, P (Facility Damage|Hazard) is the conditional probability of damage given the occurrence of the “hazard”.

This presentation discusses the role of geohazard investigations in managing the risks associated with engineering of critical infrastructure projects and draws on experience from both onshore and offshore developments. I will illustrate the importance of carrying out proper fit-for-purpose investigations by discussing how new data and geological hazard investigative techniques in offshore western Australia has changed the perspective of the region from being geologically “benign” to being a region with significant earthquake loads and potentially catastrophic slope failure hazards. I also will discuss examples of how geohazard risks to onshore pipelines have been mitigated and how geohazard risk can be communicated to stakeholders.

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PROFILE

James Hengesh has 30 years' experience conducting investigations to characterize geological and seismic hazards for major infrastructure projects worldwide. His project experience includes both field and office studies to address each of the five major types of hazards including: surface fault rupture, strong ground shaking, liquefaction, landslide, and tsunami. Mr. Hengesh has been an invited member of several National Science Foundation *Learning from Earthquakes Program* post-earthquake reconnaissance teams and has been funded by Chevron, the Australian Research Council Centre of Excellence for Geotechnical Engineering, and the U.S. Geological Survey as part of the National Earthquake Hazard Reduction Program. He has contributed to the books Geomorphology for Engineers and the Encyclopaedia of Marine and Offshore Engineering. Mr. Hengesh is now completing his doctorate through the Centre for Offshore Foundation Systems at the University of Western Australia.