

**The Structural Integrity of Offshore Pipelines Crossing Active Faults****Aikaterini Triantafyllaki, PhD candidate**

University of Cyprus

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<https://ucy.zoom.us/meeting/register/tJwvdOqvqTgoGtcsGrFTPxJZNmEHKH1Pdbm>

Summary: Offshore pipelines often cross large areas with geomorphological, geological and tectonic conditions that may pose a variety of geohazards, one of which is the co-seismic slippage of active tectonic faults. Ground movement induced by fault slippage imposes substantial straining on the pipelines, threatening their integrity. This study presents the results of a series of large-deformation parametric finite element simulations of a partially embedded pipeline resting on a fine-grained seabed and subjected to the differential movement of an active tectonic fault (normal, reverse, strike-slip). Parametric computations were performed for different values of the angle between fault strike and the pipeline axis, shear strength at the seabed surface and different contact conditions at the soil-pipeline interface. The pipeline is examined for both pressurized and non-pressurized conditions and for different values of wall thickness and pipeline embedment. The developed strains in the pipeline with the application of fault displacement are determined and compared with appropriate performance criteria for steel pipelines. It was found that pipeline safety against a fault rupture may be significantly improved by simply adjusting the routing at the location of fault crossing. A uniform design study is presented to assess the significance of the aforementioned parameters and to establish an evaluation index and the critical fault displacement, to assess the integrity of submarine pipelines as they are subjected to fault movement. The results from the present study can be used for the performance-based assessment of offshore, partially embedded steel pipelines in seismically active regions and the development of optimal routing strategies.

Short bio : Aikaterini Triantafyllaki is a Ph.D. candidate in the Department of Civil and Environmental Engineering at the University of Cyprus. She graduated from Thessaloniki's Aristotle University with a five-year diploma in Civil Engineering. Her research interest focuses on geomechanics, structural analysis, finite element modeling and pipeline engineering. As a Ph.D. Candidate, she received awards and funding from the University of Cyprus's Evagoras Scholarship for Doctoral Students, the A. G. Leventis Foundation, and the Sylvia Ioannou Foundation. She has worked as a Teaching Assistant during her postgraduate studies. She has been working as a Specialist Scientist at the University of Cyprus-funded internal research program 'SubseaPipes' from June 2021.

