Eren Uckan, Int J Petrochem Res. 2018
http://dx.doi.org/10.18689/2638-1974.a2.004

Performance Based Assesment of Buried Hydrocarbon Pipes in Geohazard Areas

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The large diameter steel hydrocarbon transmission pipelines are considered as critical infrastructures (CI) as they play vital roles in the quality of life and energy supply in urban regions.Such pipelines usually extend over thousands of kms by crossing borders and severe geohazard areas. Fault displacement hazard is among the most critical type of ground hazard for buried steel pipes as it may cause large deformations in the pipe and impose a major risk for the structural integrity of the overall transmission system. The seismic design ofburied pipes at fault crossing is based on the optimization of the pipe axial strain wrt the pipe-fault orientation angle, burial depth, soil backfill material, geometric and material properties of the pipe.The state of the art methods, performance based based assesmentof both the simplified and 3D models, their limitationsand pipe damage examples from past earthquakes will be presented. Considering the fact that Turkey forms an energy corridor between the Southern Caucasia and Europe, safe design hydrocarbon pipelines is of paramount importance.Suggestions will be madefor the assesment, design and mitigation of earthquake risk of buried steel pipes at fault crossings.

Biography:

Dr. Eren Uckan is an associate professor at Earthquake Engineering Department of Kandilli Observatory and Earthquake Research Institute of Bogazici University. Between the years 2009-2011, he worked at Saudi ARAMCO Chair of KSU to investigate the earthquake safety of desalination plants and water transmission pipelines in the west coast of SA. His fields of interest are lifeline and infrastructure earthquake engineering, industrial structures, liquid storage tanks, water and hydrocarbon pipelines, seismic base isolation, experimental methods, testing and certification of non structural elements. Dr. Uckan has recently participated inthe STREST-FP7(Risk base assesment of major hydrocarbon transmission pipelines), NATO SfP (BTC p.peline), MarDIM (Japan Turkish: Industrial tanks) projects. He is currently theleader of on ongoing H20202 project STORM which is about the protection of cultural heritage (CH) in Europe. He is a member of the Lifelines committe of the Turkish Earthquake Foundation. He has nearly 150 publications in the form of journal and proceedings papers and technical reports.