Analysis of Buried Pipes Subjected to Shock and Impact loads

The project investigates the structural response of buried pipes due to external loads, in particular due to sub-surface bomb blasts. Finite element analysis is employed to provide computational analysis due to the high complexity of the problem, which include solid-solid interaction, soil-structure interaction, progressive damage modelling and blast loads.

Extensive material characterization tests, such as uniaxial mechanical tests of pipe coupons at high and low strain rates, multiaxial loading mechanical tests of pipe sections and geotechnical centrifuge blast tests are carried out to determine suitable material models and parameters used in the simulations.

Towards the end of the project, a full scale blast test will be carried out to verify simulation results.

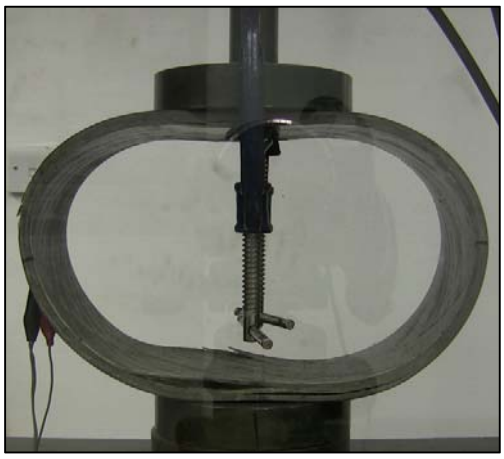

Figure 1: Testing of pipe integrity

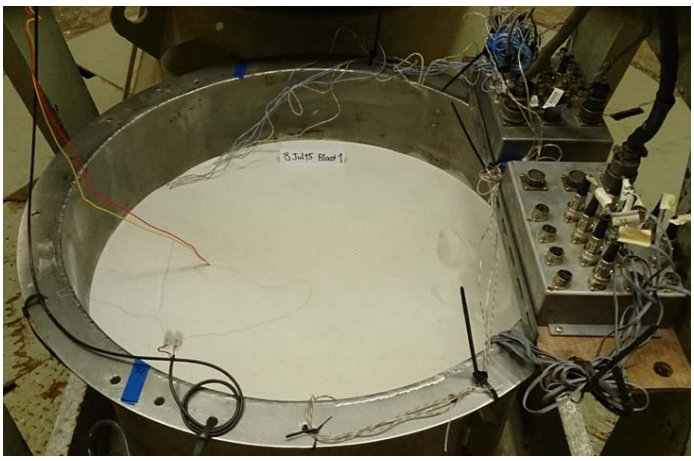

Figure 2: Centrifuge modelling of blast in sand

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