

Structural integrity under extreme loads

Topic: Pipeline detonation modelling

TITLE: Numerical models of hazardous event in gas transportation pipelines

RESEARCH BACKGROUND:

Although pipelines are a consolidated infrastructure to transport gas, accidents still occur due to the hazardous inflammable compound considered. Numerical modeling of detonations in pipelines is a fast and reliable tool to assess current infrastructure against adverse events. The aim of this thesis is to simulate numerically cases where explosions occur to verify the safety of the pipelines.

RESEARCH ACTIVITIES:

1. Literature review of accidents in pipelines
2. Modelling of explosion propagation through CFD
3. Numerical investigation of three representative cases
 - a. Investigation of Deflagration to Detonation Transition (DDT)
4. Numerical structural assessment of pipelines against impulsive loads

METHODOLOGY: Numerical

DURATION: 9 months

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