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### **[Abstract Title]**

Simulating the dynamic processes of landslide loads on pipelines

### **[Abstract]**

Mass movement phenomena, such as landslides or debris flows, can cause the failure of aboveground pipelines leading to accidental releases of hazardous materials. A previous study proposed a simplified quantitative-mechanistic model to estimate the probability of landslide and the probability of failure of the pipeline due to landslides. The proposed methodology offers a new approach, utilizing the simplistic slope stability analysis method to determine the stability of each node from the provided Digital Elevation Model, and estimate the subsequent strains on the pipeline due to the landslide. The current study develops a dynamic vulnerability model which allows the estimation of the pipeline failure probability based on real-time data input. The deformation of the pipeline is set as the failure criterion. Based on the existing solver (Volume Of Fluid ) of OpenFOAM, the dynamic process of landslide-debris flow is simulated in using a spatial mesh within which the pipeline mesh is embedded. Thus, the stress distribution of the pipeline is obtained and compared with the resistance to stress in order to evaluate the deformation of the pipeline. The preliminary results of this work will be presented.



**[Keywords]**

Natech accident, Landslide simulation, Pipelines