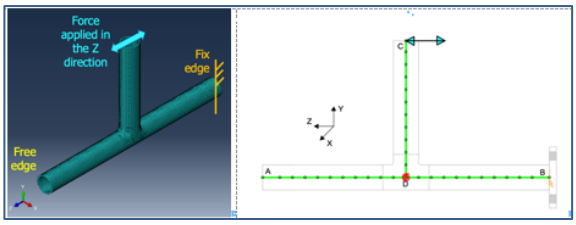
Seismic Safety through Enhanced Risk Management
https://peer.berkeley.edu/openSRA

OpenSRA – Seismic Response of Pipeline and Gas Storage Surface Infrastructure

OpenSRA is a new open-source seismic risk assessment software tool for gas utility regulators and owners that will enable them to strategically address challenges posed by the risk from earthquakes and other geological hazards. *OpenSRA* includes recent computational modeling and laboratory testing of surface infrastructure components and systems. This research provides better information about the fragility of gas storage surface infrastructure.



Component Modeling

Component Testing


Surficial System (photo: Socal Gas)


System Testing

Results

- Data inventory conducted for seismic performance of gas storage facility subsystems and their individual components. Procedures for computational modeling and laboratory testing established.
- Procedures developed for laboratory testing of system components, including pipe elbows and other connections.
- Representative shaking table testing conducted to capture seismic vulnerabilities of systems.
- Computational models developed to validate laboratory testing of components and systems.

Benefits & advantages

- Results compiled into *OpenSRA* to aid in studying earthquake scenarios, prioritizing mitigation efforts, and planning post-earthquake assessments of a buried pipeline system.
- Research results from computations and laboratory testing provide state-of-the-art information that is incorporated in fragility curves for surface infrastructure components and systems.
- System-wide fragilities and prioritization of mitigation will provide *greater reliability* of the overall system. A methodical and rational approach to implementing mitigation *increases safety.*

Pantoli E., Hutchinson T.C., Elfass S.A., McCallen D.B. 2022. Performance-Based Earthquake Engineering Assessment Tool for Natural Gas Storage and Pipeline Systems, Task D Final Report - Seismic Response of Pipeline and Gas Storage Surface Infrastructure. California Energy Commission. July 2022. *[PEER research report in progress.]*