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## **Abstract**

The vast majority of buried pipelines are not designed to accommodate significant localized ground movement such as that caused by landslides, earthquakes, or subsidence/settlement. When such a ground movement event occurs along the right-of-way (ROW) of a buried pipeline, it is imperative that the pipeline operator determine whether the ground movement is a threat to pipeline integrity in order to protect those responding to the event, those living near the affected ROW, and the environment.

This paper covers the development of a response plan that provides guidance to pipeline operators responding to a ground movement event. This response plan guides the investigation and addresses the unique conditions associated with such events.

The response plan covers some critical decisions after an event, including, but not limited to (1) whether the event affects the pipeline, the local right-of-way (ROW), or those living adjacent to the ROW, (2) control of flow, i.e., the need for shutdown or pressure reduction, and (3) work needed to return the line to full-pressure service. The overall response plan is presented in three main phases.

- Phase 1: Immediate Response. In most cases, this phase may take a few days to a few weeks. The most important goal of this phase is minimizing the risk of pipeline failure and the potentially negative impact on the surrounding properties and environment.
- Phase 2: Follow-on Assessment and Actions. This phase may take weeks to months. The overall goal of this phase is returning the affected pipeline to full-pressure service. The necessary work to achieve this goal may be completed in this phase or may have to be done in Phase 3.
- Phase 3: Long-term Management. This phase focuses on long-term management of the geohazard and/or pipeline so that the risks associated with operating the line at the affected location are reduced to and then maintained at a tolerable level.

The structured response plan and associated guidance are presented in a self-contained stand-alone document available from PRCI. Parts of the document or the entire document can be adopted by operators, depending on the extent of existing procedures an operator may have. Alternatively, company-specific information and procedures can be added to the document to form a company-specific SOP.

## **Keywords**

Geohazards, landslides, settlement, emergency response plan, integrity management, fitness-for-service assessment, strain-based assessment