



Pipeline Geohazards & Third-Party Threat Interference

- Natural and anthropic conditions that occur in several Latin America Countries have let the Geohazards and the Third Parties Actuate have reach a high importance in the technical risk in the oil companies.

THIRD PARTIES
(41%)

**OPERATIONAL
EVENTS(1%)**

**EXTERNAL
FORCES(20%)**




**INTERNAL
CORROSION (0%)**

**EXTERNAL
CORROSION(15%)**

**CRACKING
(0%)**

**CONSTRUCTION
DEFECTS. (21%)**

**COMPONENTS
FAILURE (2%)**

Third Parties	Hydro hazards	Geotechnics
		



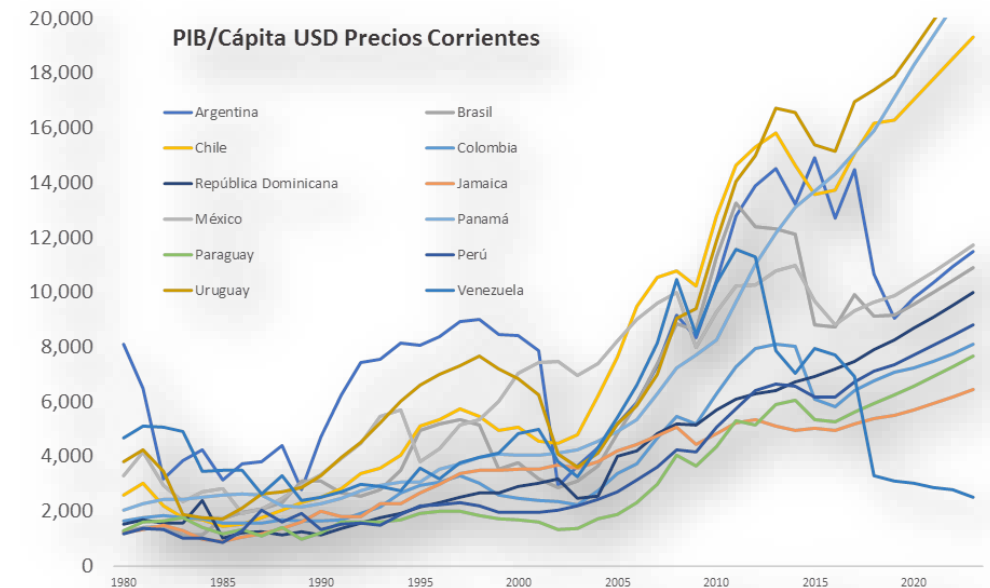
Regional Context

- The upward economic dynamics in Latin America, develop of infraestructura, lack in regulation and land-owners and demandings communities, that make the Third Parties Threat would be an important factor to be taking into account



Economic evolution of the Gold prize in last 50 years

Source: Internet



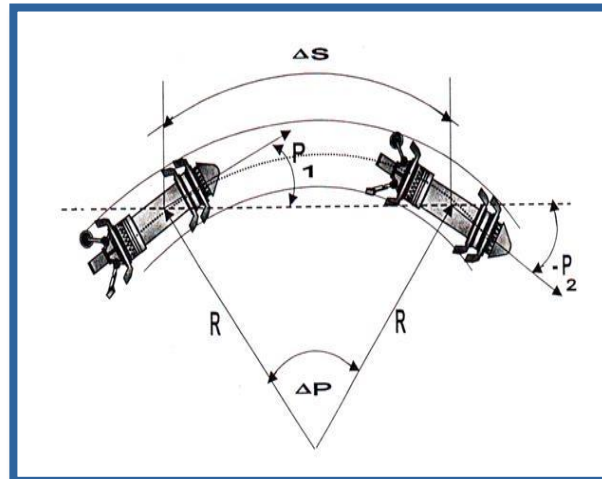
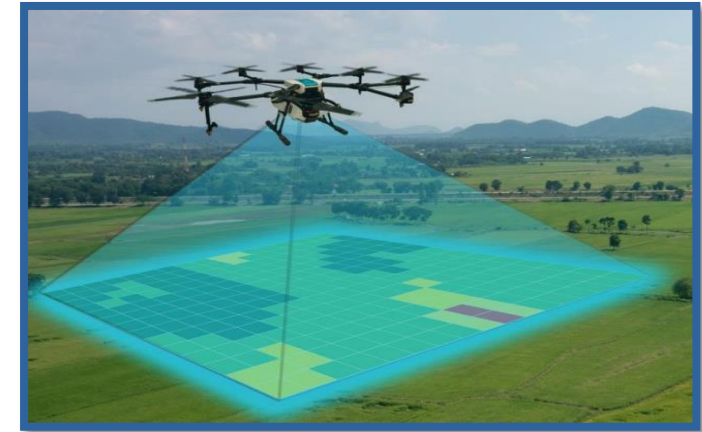
Economic Upward in Latin America, lastest 40 years

Source: Internet



Monitoring Activities

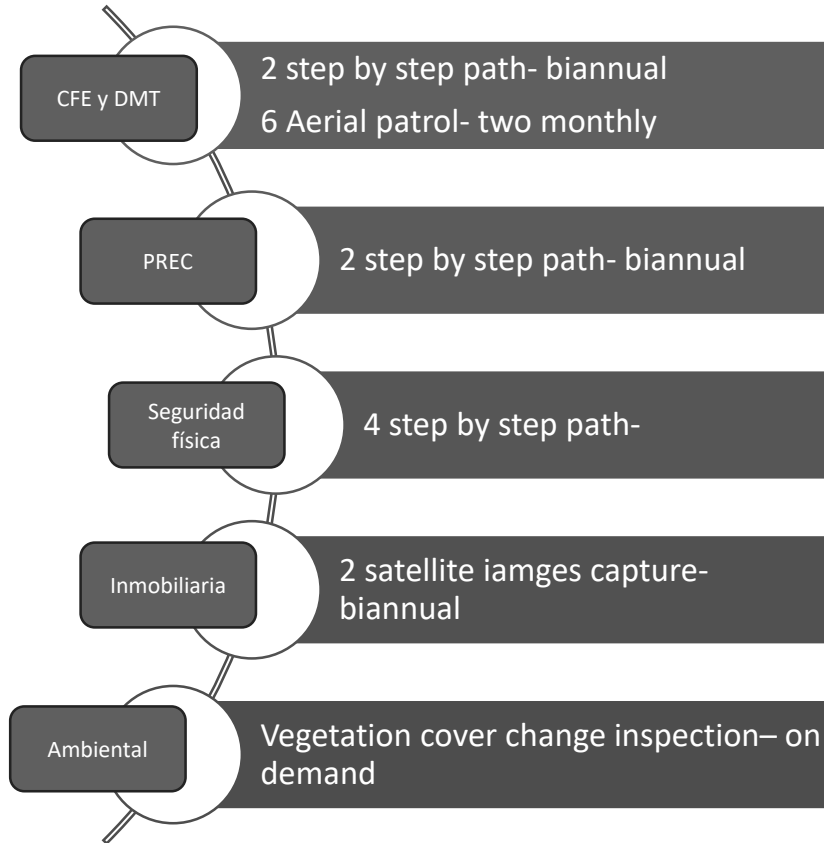
- The engineers in charge of the Right Of Way (ROW) maintenance, frequently geotechnics engineerings with comprehensive assure functions, are the responsables in the detection, mitigation and control of the third Parties Threat. The aerial and terrestrial patrols and specialized monitoring of the terrain are trasversal techniques to identify the geohazards and third parties hazard.



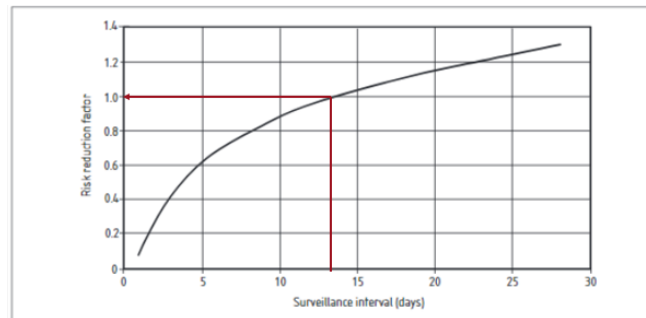


Monitoring and Inspection, ODL Experience

In the past

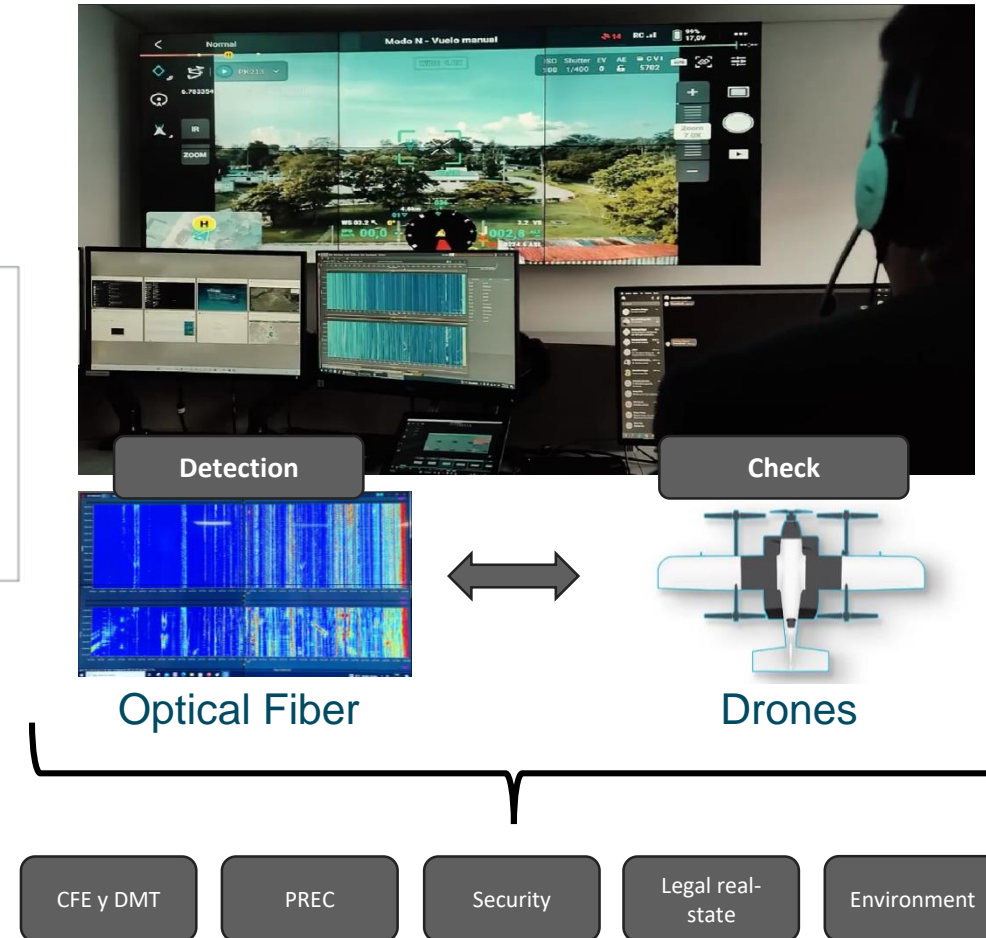


Industry recommendation



reduction in failure frequency due to external interference vs surveillance frequency- Source: PD 8010-3-2009+A1-2013 (UKOPA)

SIAD – Real time monitoring





Civil Works

- Many times, the third parties' threat derives in common problems with the geohazards, for example, when the interfering cut a slope for a road construction, or make ditch or open pit mining affecting the ROW stability. The control Works are similar to civil, geotechnics or Hydrotechnics Works.



Affectation for open pit mining -PK 524 a 525



Executed works





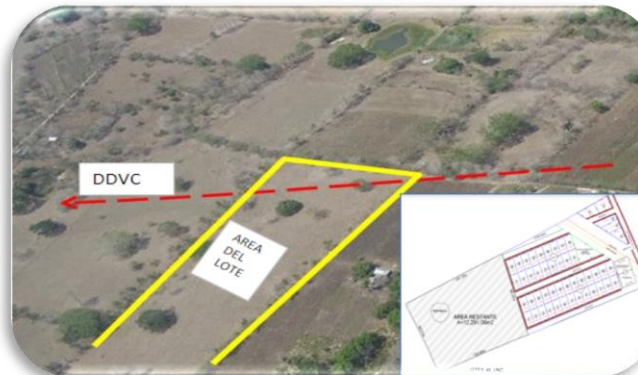
Types of third parties Threat

- Another cases of threats identified in the Colombian pipelines

Affectation in rivers for drag for minning.



Housing construction projects on the ROW



Concentred Water in the construction of the roadway—
Gully generation





Highway interference Case

