



# BENDING STRAIN ANALYSIS



Geohazards monitoring are a critical part of pipeline integrity programs. Skipper NDT brings to market a novel technology to complement existing methods.

US and Canadian pipeline regulations (CFR 192 & 195 & CSA Z662) include requirements and standards that pipeline operators are held to for the identification and management of geohazard threats.

Operators have several methods available for collecting spatial data, however many come with limitations and complexities with soil, terrain, and pipeline configurations: Ground Based Surveys, aerial Based Surveys, inline inspection (ILI) with inertial mapping units (IMU).



High cost



Require more in-depth planning



May disrupt normal operations



May not be feasible due to the configuration or equipment associated with the pipeline (i.e., un-piggable lines)

Skipper NDT has developed a proprietary drone-based technology to create digital twins of buried assets. It supports operators to address their regulatory and operational integrity requirements.



## Field operator safety

→ Fully automated data acquisition done remotely



## Can be run on a higher frequency than ILI can

→ due to non-intrusive inspection technique and more discrete inspection areas



## Operational advantages

→ Can find and map both known and unknown locations of bending strain

→ Adapted to any type of metallic pipeline diameter from 2" to 48"

→ Able to cover up to 1 mile per day



## High quality data :

→ Average Z axis accuracy : 3.4"

→ Average XY axis accuracy : 5.5"



## High data density allowing

→ advanced pipeline integrity operations such as bending strain assessment



## High sampling frequency

→ One point of measurement every 2'



## Certified technology by major operators

→ PG&E, Chevron, PRCI

# TRADITIONAL APPROACH

## INCLUDES

- ⊕ ROW Access for geohazard inspection crew
- ⊕ Limitations in aerial survey data density/precision
- ⊕ Extended times to obtain data/ infrequent updates with high precision
- ⊕ Coarse and sometimes inconclusive data acquisition
- ⊕ Unnecessary safety risks

## RESULTS

- ⊗ Longer inspection times
- ⊗ Manual data acquisition procedures
- ⊗ Increased risk
- ⊗ Lower density/quality data/difficult decision making
- ⊗ Higher total lifecycle cost due to uncertainty in decision making

# SKIPPER NDT'S APPROACH

## INCLUDES

- ⊕ Technology focused solution
- ⊕ Efficient, non-disruptive data collection
- ⊕ Accurate and repeatable at higher frequency
- ⊕ Fully documented with electronic records
- ⊕ Dense, precise data for regular based bending strain analysis updates

## RESULTS

- ✓ 3 times faster than traditional inspections
- ✓ 100% automated data acquisition procedure
- ✓ Reduced risk
- ✓ High quality, repeatable data acquisition enabling confident and effective decision making
- ✓ Low total lifecycle cost due to optimized decision making



Cost saving:  
up to  
**70%**

Turnaround  
time:  
**10x** faster

## LEARN MORE ABOUT

Read **our engineers' paper about bending strain analysis**  
on our website [www.skipperndt.com](http://www.skipperndt.com)