

Hatfield-3202: Monitoring pipeline stability in discontinuous permafrost

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Challenge

Challenge ID:	HCP-3202	Originator:	Onshore: Hatfield
Title:	Monitoring pipeline stability in discontinuous permafrost.		
Theme:	ON 3.2: Subsidence monitoring - Infrastructure monitoring		
Consortium Lead:	C-CORE	Interviewed Company:	C-CORE
Geography:	ON.REG.03 - Canada		
Challenge Description			
What is not possible / not adequately addressed at present?			
There is a need to improve methods for monitoring / assessing / determining the stresses on pipelines due to discontinuous permafrost. Issues are as follows: ground movement stresses during freeze-thaw cycles in non-permafrost areas is distributed along the length of the pipeline; and, in discontinuous permafrost there is an additional complication at the boundary of the permafrost (stable ground) and non-permafrost (moving ground).			
What effect does this challenge have on operations?			
The impact during the design phase is on the safety margin associated with the pipeline thickness required (i.e. capital cost implications). The operation risk is pipeline failure over time, exposed pipeline at surface.			
Thematic information requirements:	Surface motion (horizontal and vertical) Terrain information		
What do you currently do to address this challenge?			
How is this challenge conventionally addressed?			
Geotechnical surveys during route planning and updated surveys during operations which includes inline PIG surveys, aerial surveys, field surveys.			
What kind of solutions do you envisage could address this challenge?			
Historical analysis of ground movement and permafrost maps for trends (typically over two seasons of ground movement and permafrost maps to assess current status).			
What is your view on the capability of technology to meet this need?			
Are you currently using EO tech? If not, why not?			
Most work is currently done with modeling and is based on low-resolution mapping.			
Challenge Classification			
Impact on Lifecycle (0=none, 4=high):		Climate / Topography / Urgency:	
Pre-license:	3	Climate class:	Polar
Exploration:	2	Topographic class:	Snow / Ice
Development:	3	Seasonal variations:	Colder weather focus
Production:	4	Impact area:	Cost reduction
Decommissioning:	0	Technology urgency:	2 - Short term (2-5 years)
Challenge Information Requirements			
Update frequency:	Monthly		

Data currently used:	LiDAR Air photos High resolution imagery InSAR
Spatial resolution:	License
Thematic accuracy:	Not specific
Required formats:	Not Specific
Timeliness (Vintage):	Within a week
Geographic extents:	License
Existing standards:	None

Relevant products

Content by label

There is no content with the specified labels