ShearFRAC®

Prediction of a 4.6M Induced Seismicity Event: Utilizing the Richter Predictor® for Proactive Seismic Monitoring

Challenge

+ Injection induced seismicity and bedding plane slippage poses several operational risks such as casing deformation, compromised well integrity and regulatory implications.
+ Rigorous mitigation strategies are required to manage the risks associated with seismic events caused by hydraulic fracturing.
+ Traditional monitoring methods fail to anticipate seismic activities and are mainly used as a postmortem analytical tool.
+ Due to this inadequate preparedness little can be done to mitigate an impeding event.

Solution

+ Richter Predictor® is an advanced analytical tool employing pressure signal analysis to assess seismic risk in real-time.
+ This predictive tool identifies fluidization of bedding planes or faults prior to the occurrence significant seismic events (Fig. 1).
+ Identification of these pre-cursor events (tremors) are crucial for assessing and mitigating risks associated with these events.

Results

+ In a notable scenario, Richter Predictor® successfully pre-predicted the fluidization of geological features days in advance of a 4.6 magnitude seismic event in the Montney Fm of NE BC.
+ This tool was able to identify slip-stick sequencing within the pressure signal leading up to the large-scale induced event.
+ The predictive success demonstrates the use of pressure signal analysis as a cornerstone technology in managing induced seismicity in hydraulic fracturing operations.

Basin – WCSB

Formation – Montney

Location – Blueberry, BC

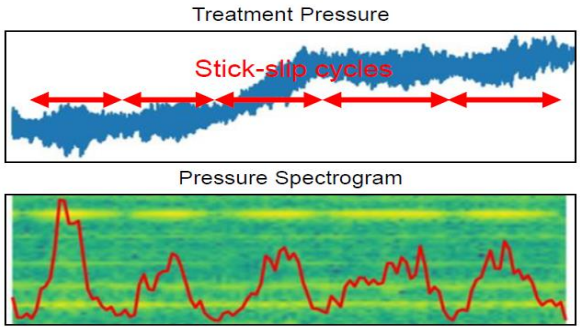

Fig 1: Pre IS Event

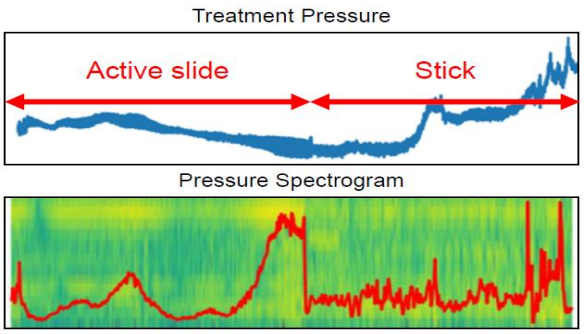

Fig 2: 4.6Mw IS Event

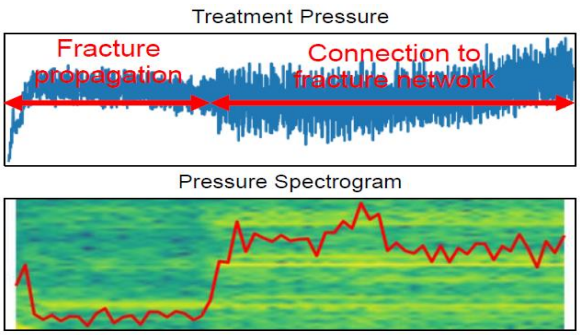

Fig 3: Post IS Event

For More Information:

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