FIBER OPTIC TECHNOLOGY AND REAL-TIME DATA: YOU CANNOT OPTIMIZE WHAT YOU CANNOT SEE

Quick Fiber Facts:

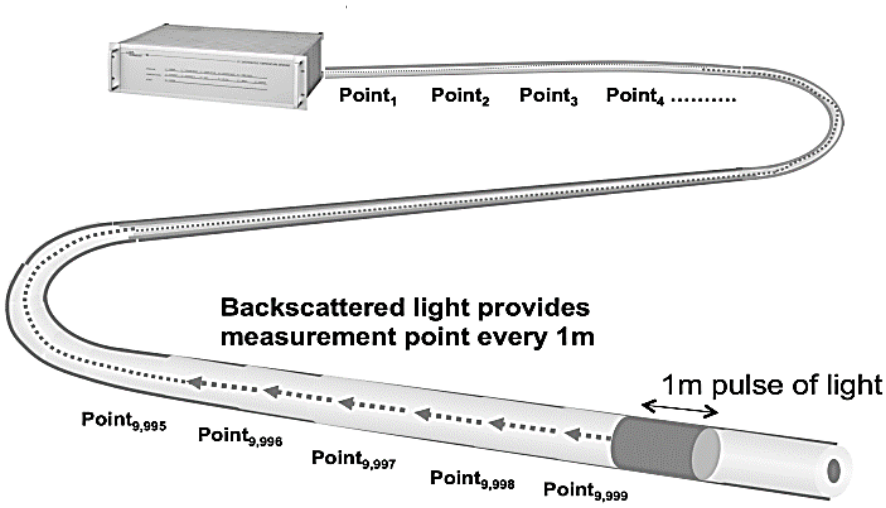
- Provides real-time downhole data
- Fiber is the sensor - get thousands of data points on a single line
- Senses temperature and acoustics
- Capillary fiber optic line inside STEP's 7,100 meter 2-3/8" string of coiled tubing
- Proven in extreme environments
- No moving parts and therefore reduces operational complexities
- Highly accurate with great spatial resolution
- High signal to noise ratio - ability to sense very small events

Quick Fiber Reference:

- DAS – Distributed Acoustic Sensing
- DTS – Distributed Temperature Sensing

Access to real-time downhole data has become a focus for producers looking to get more out of their stimulation and completion strategies. Operators have realized you cannot optimize what is not being monitored. STEP-IQ™ real-time data services provide reliable, real-time measurements allowing operators to evaluate critical job parameters and make instant decisions to improve treatment programs.

As a part of the STEP-IQ suite of products, STEP's fiber optic technology - deployed inside coiled tubing - gives the operator the ability monitor downhole conditions along the entire wellbore. The fiber cable measures temperature (DTS - Distributed Temperature Sensing) and acoustics (DAS - Distributed Acoustic Sensing). This real-time data is sent to surface and provides the information required to make immediate, strategic decisions to optimize treatment programs.



The fiber cable is the sensor – measuring temperature and acoustics - and provides measurement points at one meter increments.

Applications

1. Production Logging:
   - Instantaneous analysis of all stages while coil is parked on bottom
   - Once on bottom, no movement of tools; reduces cost, and operational complexities

- Evaluate fracture effectiveness of individual stages
- Indicates depth the production is coming from in the formation, not just the entry point into the casing

2. Injection Profiling:
   - Identify non-uniform injection; waterflood efficiency
   - Leak detection; casing integrity
3. Frac Monitoring:
   - Deployed in offset well to optimize frac treatment in real time without a permanent install

Efficiencies

- Flow through nozzle at end of coil
- Option to add extended reach tool to BHA
- Robust design increases probability of reaching TD relative to conventional PLT
- Gives operators the ability to treat a well, diagnose and optimize the treatment for future completion programs