

Case study: US Land, Texas

# SureVIEW DTS provided real-time hydrogen storage cavern capacity and integrity measurements

A customer in North America Land utilizes underground caverns to store hydrogen gas until it can be sold for a multitude of industrial and manufacturing applications. From a commercial, as well as a health, safety and environmental (HSE) perspective, it can be problematic if these wells leak into the ground or groundwater in the surrounding areas. Regulatory standards are in place for monitoring and prevention of gas leaks from these kinds of storage wells.

Traditionally, monitoring has been done using temporary logging tools for noise irregularities (indicative of a leak), temperature logs looking for thermal anomalies (indicative of subsurface flow), casing thickness measurements, and general casing integrity checks. The problem with these kinds of measurements is they are taken for short periods of time between long intervals and at high cost.

The operator reached out to Baker Hughes for an alternative permanent solution that could provide continuous real-time data from a permanently installed distributed temperature sensing (DTS) system. The Intelligent Production Systems team offered the **SureVIEW™ DTS system** in conjunction to the **SureVIEW™ PT single point pressure temperature gauge** with **CoreBRIGHT™ SMF single mode fiber**.

The industry leading Baker Hughes hydrogen-resistant technology allows fiber optics to perform reliably in this

application for the life of the well. Traditional telecom fibers would be subject to the effects of hydrogen darkening, a condition in which hydrogen enters the fiber and diminishes the transmission of light through the fiber to the interrogator, preventing accurate downhole measurements. Baker Hughes **SureVIEW™ TEF tubing encapsulated fiber** has demonstrated its resiliency in this specific hydrogen rich application for over five years without any degradation of the fiber at the time of this publication.

The Baker Hughes solution allows the operator to pinpoint thermal anomalies, monitor fluid levels, and monitor pressure changes within the storage well as all of these conditions can indicate the presence of a leak. Running to a depth of approximately 5000 ft. (1524 m), the SureVIEW TEF fiber created a real-time temperature profile of the well. Utilizing historical data comparison, any changing conditions in the well was identified immediately and provided the customer the option to initiate leak mitigation if necessary. This flawless installation was completed by Baker Hughes personnel without nonproductive time (NPT).

Assuming that all storage wells will leak at some point without intervention, this Baker Hughes technology potentially saved the operator hundreds of thousands of dollars in costs related to cavern de-

## Challenges

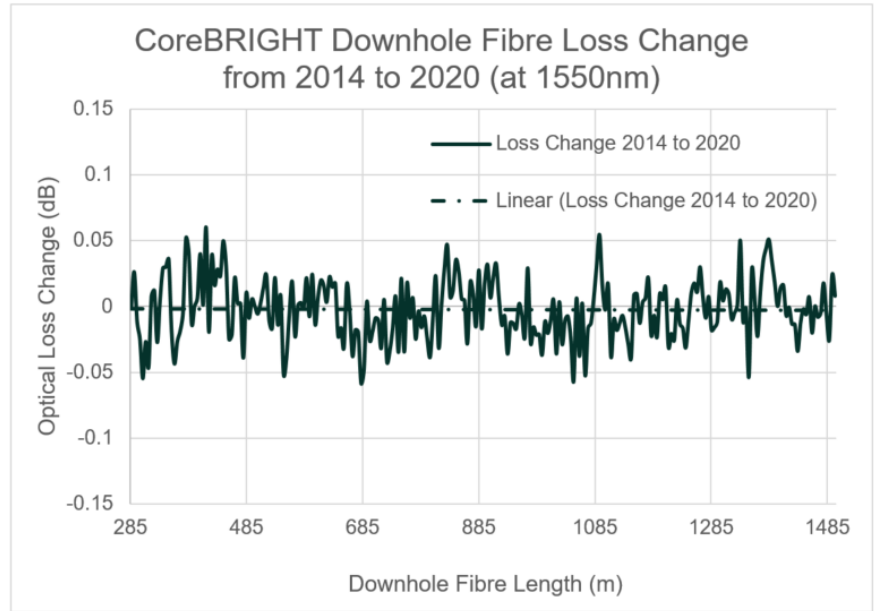
- Install fiber optic monitoring system in hydrogen storage well
- Deliver reliable bottomhole temperature profile and fluid level monitoring

## Results

- Deployed superior hydrogen resistant DTS technology to depth
- Enabled real-time pressure/temperature data to provide remote bottomhole observation and real-time gas cavern decision making power
- Experienced no health, safety and environmental (HSE) issues or nonproductive time (NPT)

pressurization and lost time for running temperature logs.

Additionally, over the lifetime of the well, the operator will benefit from early identification and rectification of casing leaks, which can save several hundred dollars in fines and lost product.



A comparison of the optical time-domain reflectometer traces (OTDR) taken at installation and after 5 years. This shows the resiliency in the fiber, as the signal attenuation profile is unchanged.

