

Installation of a Down-Hole Pressure/Temperature Gauge on a Hanging String in a Gas Storage Cavern

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Abstract

The purpose of this paper is to summarize the installation of a single point pressure/temperature gauge externally mounted to an 8 5/8" (219mm) hanging string with fiber optic communications cable running to surface. The installation of the recording equipment was included as part of a well conversion from leaching to natural gas storage service. The subject well is the Mississippi Hub Cavern Well No. 2 located in the Bond Salt Dome in Simpson County, Mississippi.

The final natural gas storage configuration included an 8 5/8" (219mm) de-watering string set at a depth of 5,117' (1,560m) (24' / 7.3m above cavern TD) with a down-hole single point gauge installed on the exterior of the string, at a depth that was nominally equivalent to the mass-weighted center of gas in the cavern (4,585' / 1,397.8m).

The program to install the 8 5/8" (219mm) string included features to protect the fiber optic cable and gauge during installation and for any future removal of the casing, as well as to protect the system from any unexpected movement of the hanging string during natural gas storage service. These features included equipment mounted to the casing string and wellhead modifications.

A custom 8 5/8" (219mm) casing hanger and casing head adaptor were manufactured to accommodate the need for the communications cable to exit the wellhead and connect to the operator's SCADA (supervisory control and data acquisition) system for convenient data monitoring and acquisition from the facilities main control room.

A subsequent wellhead issue unrelated to the initial gauge installation required removal and re-installation of the hanging string and gauge system.

Key Words: Gas Storage Cavern, Gauge, Down-Hole Gauge, Hanging String, De-Watering String, Fiber Optic Cable, Wellhead Cable, Casing Hanger with Cable, Hanging String Centralizers, Bond Salt Dome, Mississippi Hub

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