

The CARBONTRACKER Gas Metering System—a new way for real time reservoir characterization while drilling underbalanced

Well Information

LocationSouth Texas
Date.....Jan – Feb 2009
Flare line size 12 in (30.48 cm)
Flare measurement results..... 3 hrs @ 106 scf/d followed by 7 hrs of little/no flow, then 2nd surge for 11 hrs @ 104 scf/d

The Situation

The operator was seeking to precisely determine the volume flow of gas in the flare line during flaring episodes occurring while drilling. Previously, height and duration of the flare were the only indication of gas presence while drilling but did not provide an accurate measure of the precise volume of gas being flared.

The Solution

M-I SWACO recommended a CARBONTRACKER⁺ flare line gas metering system was installed on this location to provide accurate, real-time data of gas volumes.

The two main objectives of these tests were: (1) install the ultrasonic meter and to interface with the rig's EPOCH system, and (2) measure flare gas within 10,000 and 1,000,000 standard cubic feet per day (scf/d), both of which were successfully met from safety and operational standpoints.

The 12 in flare line was cut and prepped to accept the ultrasonic meter flowcell as shown in Figures 1 & 2.



Figure 1



Figure 2

The flowcell was installed 28 feet downstream of the MUD GAS SEPARATOR¹ and 67 feet from the end of the flare line, as shown in Figures 3 & 4. The console and the WITS translator box were accommodated in a tool box, which was placed 10 feet upstream of the flowcell, in compliance with the rig's requirements.



Figure 3



Figure 3

Approximately 500 feet of fiber optic cable was needed to connect the ultrasonic meter console to the data logger in the tool pusher's trailer. To accomplish this task, two 300 ft spools of fiber optic cable (FOC) were used, and a repeater box (signal booster) was utilized to splice the two sections of FOC. Power for the fiber optic module was obtained from within the tool pusher's trailer. The fiber optic module is used to connect the fiber optic leads to the rig's PC. Figure 5 shows the layout for the installation.

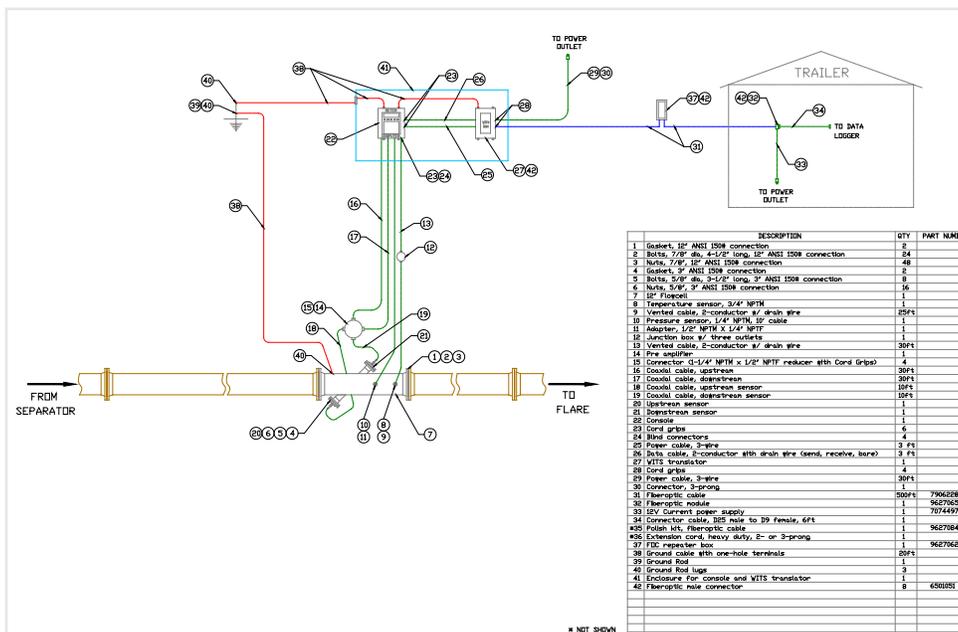


Figure 5

Once all connections were made and power to the meter was established, data transmission to the rig was initiated. The console's control panel allowed for access to diagnostic settings that were monitored as part of a daily operational inspection.

The meter was set up to do two types of data processing: (1) transfer data to the rig, and (2) save data locally for later retrieval. The parameters being transmitted to the rig during the trial were pressure, temperature, and flow rate. The parameters being locally saved were pressure, flow rate, and velocity.

The Results

The trial yielded flow rates exceeding the 106 scf/d, and it was characterized by two main flare surges. The first lasted approximately 3 hours followed by 7 hours of very low or no flow. The second surge lasted for 11 hours before settling at under 104 scf/d for the remainder of the trial (see Figure 6).

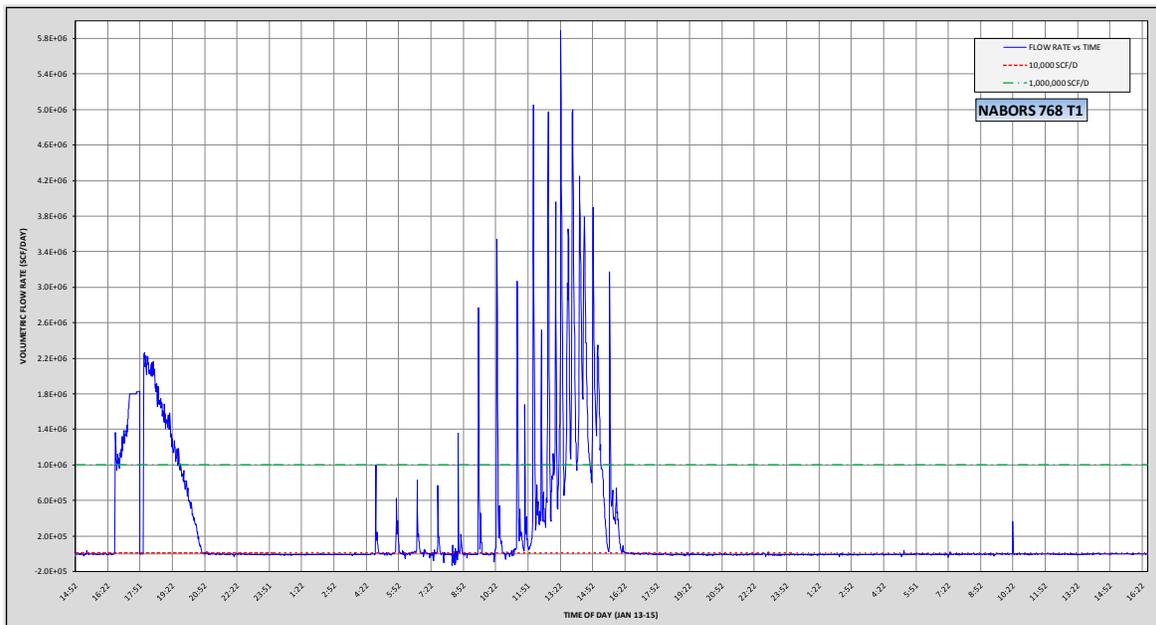


Figure 6

The data demonstrates that the meter captured significant amount of data during both flaring episodes, quantifying the precise amount of gas being flared.

The application demonstrates that the CARBONTRACKER gas metering system provides an effective means of accurately measuring quantities of gas being flared during drilling operations.

Questions? We'll be glad to answer them.

If you'd like to know more about the CARBONTRACKER Gas Flow Metering System and how it is performing for our other customers, please call the M-I SWACO office nearest you.



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