

Application Note Oil field uses Steam Assisted Gravity Drainage (SAGD) for heavy oil recovery

Customer requirements The oil company drills a horizontal well into an oil reserve that contains heavy crude oil. Steam is injected into the well to lighten the oil and allow it to flow more easily. Another horizontal well is drilled below the first one to collect the oil and pump it to the surface. In the area, there are also observation wells drilled. The client required information on the temperature of the underground structure to be brought to the surface regularly, both for efficiency and safety reasons. If the steam is injected at too great a rate, the temperature and pressure underground will become too high and could cause a blowout. If the temperature is too low, then the oil recovery will not be efficient as it could be.

Equipment

dataTaker DT505
2 *dataTaker* Channel Expansion Modules (CEM)
NEMA4 Enclosure
Battery and Solar power
Freewave Radio Modem



Sensors

Thermocouples (very long lengths)

Datataker Solution

The *dataTaker DT505*, with 2 CEMs is located at the top of the observation well, in a NEMA 4 enclosure. It is attached to the thermocouples that are down-hole at 30 points. The *DT505* is in a fully self-contained box, complete with battery and solar charging. The *dataTaker* transmits the data via a Freewave radio modem to the master unit that correlates the data from all the 15 observation wells.

To achieve optimum results, the user puts thermocouples down-hole at regular distances. The temperature is measured and the steam injection adjusted to meet parameters required for optimum oil pumping.

The reason why this solution is sought after are because the *dataTaker* is:

1. Low power. The areas are remote from power source and the cost of solar panels and battery for power for this system is low.
2. High isolation channel to channel. As thermocouples are in service down-hole for any length of time, generally a breakdown will occur reducing accuracy. To minimize this a signal conditioner with high isolation per channel will prevent incorrect readings.
3. Flexibility of data. The *DT505* can provide the data in any format required for the end user, and is easy to program to change data time frames or format.

If you need more detail on this application please contact joyce.reid@datataker.com.au

4. Low cost. The complete system, when taking into account the power requirements, installation costs, and programming costs is very competitive.
5. Easy install. The system is provided completely pre-wired and configured, so all the field personnel have to do is connect the battery and the thermocouple leads and the *dataTaker* will begin reading the points and transmitting the information to a central computer through the Freewave radio network.

This solution is unique in which the thermocouples can be installed and data provided that same day. With the cost of oil, this information is valuable.

Other application

Well Head monitoring for coal seam gas recovery

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