ZENITH
OILFIELD TECHNOLOGY LTD

ZSIGHT
EFFORTLESSLY MANAGING YOUR ESP OPERATIONS

In an industry where good information is fundamental to improving runlife, production and optimisation potential, the amount of data required to be gathered, stored and processed is growing at a rapid rate. Wells lifted by artificial lift require continuous monitoring to ensure they run within pressure and temperature limitations. Close analysis of each well becomes difficult, resulting in lost production or equipment and well failures.

ZSight™ intelligently processes well and pump information at the well site in real time. A simple status indication highlights whether the well is producing at its optimum, running with potential for optimisation, requires analysis or has shut down — the operator can now instantly recognise and prioritise wells requiring attention.

ZSIGHT AUTOMATED WELL SURVEILLANCE

As well conditions change the response of your artificial lift system must be monitored and adjusted to maintain equipment within its constraints. Manual resources required to process these streams of information are becoming stretched due to increasing well numbers.

ZSight automatically processes information relating to the interaction between well and pump. Key data points such as water cut, flow rate and bottom hole flowing pressure are calculated automatically and in real time. These are referenced against measured data points from surface and downhole pressure and temperature devices for accuracy whereby the system can judge whether the pumping system is running within a desired or undesired operating condition.

To alleviate large volumes of data all processes are performed automatically in real time at the well site, resulting in a simple well status presented to the operator unless otherwise instructed — all information necessary for full analysis is instantly at hand, locally or remotely, should the well conditions or pumping system experience problems.

All data is displayed on simple dials on a large touch screen showing real time chart and well status report. Well site personnel can quickly see when the pump and well are operating correctly. Well status can be transmitted over SCADA to simplify field management of multiple wells.

WELL STATUS

- Well Optimised
- Optimisation Potential with suggested optimum frequency or wellhead pressure
- Alarm with route cause message
- Well Stopped with route cause message
- Well Analysis or Well Test Required

> In addition, ZSight will advise potential production gains within the constraints of both well and pump performance.

Beyond measured data, ZSight derives:

Water Cut	Bottom Hole Flowing Pressure
Drawdown on Reservoir	Surface Flow Rate (if not directly available)
Pump Flow Rate	Pump Head
Pump Operating Point	Pump and Motor HP Requirement
Percentage Free Gas at Pump Intake	Pump, Motor and Overall System Efficiency
Fluid Level Above Pump	

ZSIGHT SYSTEM BENEFITS

- ZSight detects and highlights whether the well or pump is underperforming, showing possible gains obtainable or problems to be diagnosed
- Simple “well status” operating philosophy filters out unecessary operator analysis
- Automatic alarm calculation
- Consolidated data available to operators at the well site
- All processing performed at the well site — if communication links fail your well continues to be monitored and remains protected to the full capability of the system

ZSIGHT SYSTEM FEATURES

- Optimisation results are comprehensively checked against pump and well limitations using real time sensitivity studies
- All data, including completion, PVT, well test and operating data at hand locally or remotely over SCADA on demand
- Compatibale with Zenith E7 dual pressure downhole sensors
- Can be configured to operate with other gauge manufacturers dual pressure products
- Compatible with pump company surface switchboards and variable drives

ZTRENDZ

MORE OUTPUT ^ LESS INPUT

The **ZSight** panel is programmed with well details from Zenith **ZTrendz**™ Data Management Suite’s well analysis software. Individual parameters can also be updated remotely or locally on the touch screen display. Well details contain information on PVT data, ESP data, well completion data and inflow performance data. All well data is held locally on the panel once commissioned and can be accessed remotely.

ZSIGHT AUTOMATED WELL PROTECTION

Setting protection limits for your wells and pumps to ensure maximum uptime is not always performed consistently from well to well. **ZSight's** on-board algorithms and processes enable set points to be calculated automatically and set appropriate to actual well conditions happening in real time.

Algorithms take into account critical well and pump performance limitations to ensure nuisance trips are eliminated and production is shut down only when absolutely necessary to prevent damage.

> ZSight automatically calculates optimum ESP and well protection set points, configured for actual well conditions in real time, ensuring maximum runlife and integrity of production.

Well Protection Parameters

Maximum allowable drawdown for the well face pressure drop
Maximum allowable drawdown for reservoir gas or water coning
Maximum allowable flow rate for the well
Minimum and maximum pump flow rates at the operating frequency
Minimum allowable pump intake pressure
Maximum allowable motor oil or winding temperature
Maximum allowable well head pressure / pump discharge pressure
Maximum Motor HP Available
Maximum allowable free gas at the pump

Note: Each parameter's set points can be manually overridden

ZSIGHT AUTOMATED OPTIMISATION & DIAGNOSTICS

ZSight continuously suggests the optimum frequency and WHP to obtain the best production. Potential increase in production is provided as well as highlighting which "factor" — ESP or well performance — is limiting potential gains.

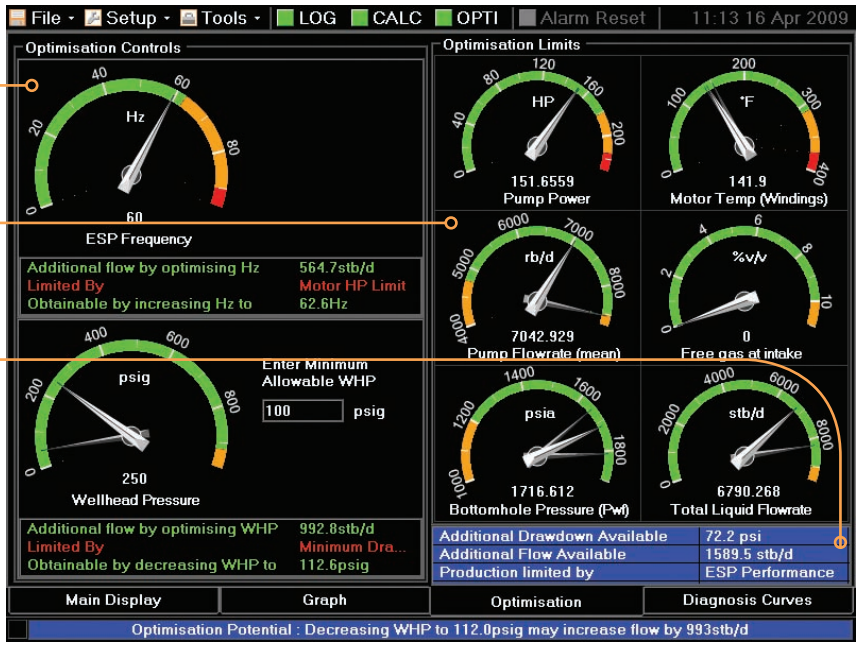
The system will continuously compare measured and calculated data. If values are within tolerance the well will be flagged as OK and no immediate action need be taken. If discrepancies occur the well will be flagged for attention whereby an operator can download complete well information locally or remotely to establish any changes that have occurred.

> "ZSight will highlight whether the ESP or the well performance is restricting production."

What is the production potential of your ESP?

What is the maximum potential of your well?

Is the well or the ESP limiting your production?



Maximise Production Against

- Maximum allowable well drawdown or flow rate
- Maximum available motor horsepower
- Maximum available pump flow rate
- Maximum allowable free gas at the pump