

Gains From DeltaV™ SaaS SCADA Delivered for Offshore Gas Lift Optimization

RESULTS

- 17.8% production gain (694.8 BOPD) through stabilization of oil recovery process and optimal gas lift remote control
- Reduced operational and safety risks through remote monitoring and control
- Team collaboration and consistency increased using a single production data source for well optimization.
- Increased revenue accounting confidence



APPLICATION

DeltaV SaaS SCADA
DeltaV SaaS SCADA Mobile

CUSTOMER

Major international exploration and production (E&P) company in Indonesia needed to optimize production on 11 oil wells located on 3 offshore platforms in the Java Sea.

CHALLENGE

No visibility to their offshore wells and the extreme costs involved for travel to get to and from the offshore site locations to monitor, manage and optimize production had this E&P frustrated with low profit margins and low production at those sites.

Strong safety concerns contributed to wanting in-office data and remote control for personnel that had to make those constant trips back and fourth offshore to make adjustments and gain visibility.

They also desired the ability to control and optimize gas lift from anywhere to enable their people with actionable analytics and faster control to optimize production.

Security concerns were high with networking and communications to such a remotely located site while keeping connectivity up and reliable with speed.

“Obtaining valuable data and control of our offshore gas lift has presented us high value in profitability returns as well production and also increased our safety for our people. No one is wasting trips to location just to get data or to make minor lift adjustments to optimize - we can do from the office now and it’s so much faster and more on point than we could have ever realized before moving ahead with it.”

Director of Operations,
Java Sea, Indonesia



SOLUTION

Emerson quickly implemented our DeltaV SaaS SCADA as part of a Production Monitoring and Optimization System (PMOS) solution to remotely monitor and analyze production data while controlling gas lift processes for their offshore oil program.

Gaining actionable, analyzed data and the ability to control equipment supported their objective and efforts to meet production targets, increase operational efficiencies and reduce safety risks.

High reliability and availability to visualize offshore equipment, and system performance contributed to significant production gains. Additional benefits included timely data, optimized gas lift, stabilized production, reduced operational costs, improved well test results and minimized safety hazards.

They quickly realized a 17.8% production improvement equating to an increase of 694.8 barrels of oil per day (BOPD).

On each offshore platform at the wellhead, an automated closed loop control system monitors vital production data such as pressures, temperatures and flow rates. Remote alarming gives operators the ability to immediately respond to any malfunctions or faults detected on the offshore platform. Data collected on location is transmitted through DeltaV SaaS SCADA's secure network, which utilizes satellite communication services and provides a managed IT and network infrastructure.

Analyzed data is viewed remotely by the end-user, anywhere and anytime with the SaaS SCADA platform. Analysis of this data through consolidation, trends and reporting empowers the end user with improved operational decisions when adjusting production remotely through gas lift control for optimal performance.

17.8%
improvement

694.8
BOPD

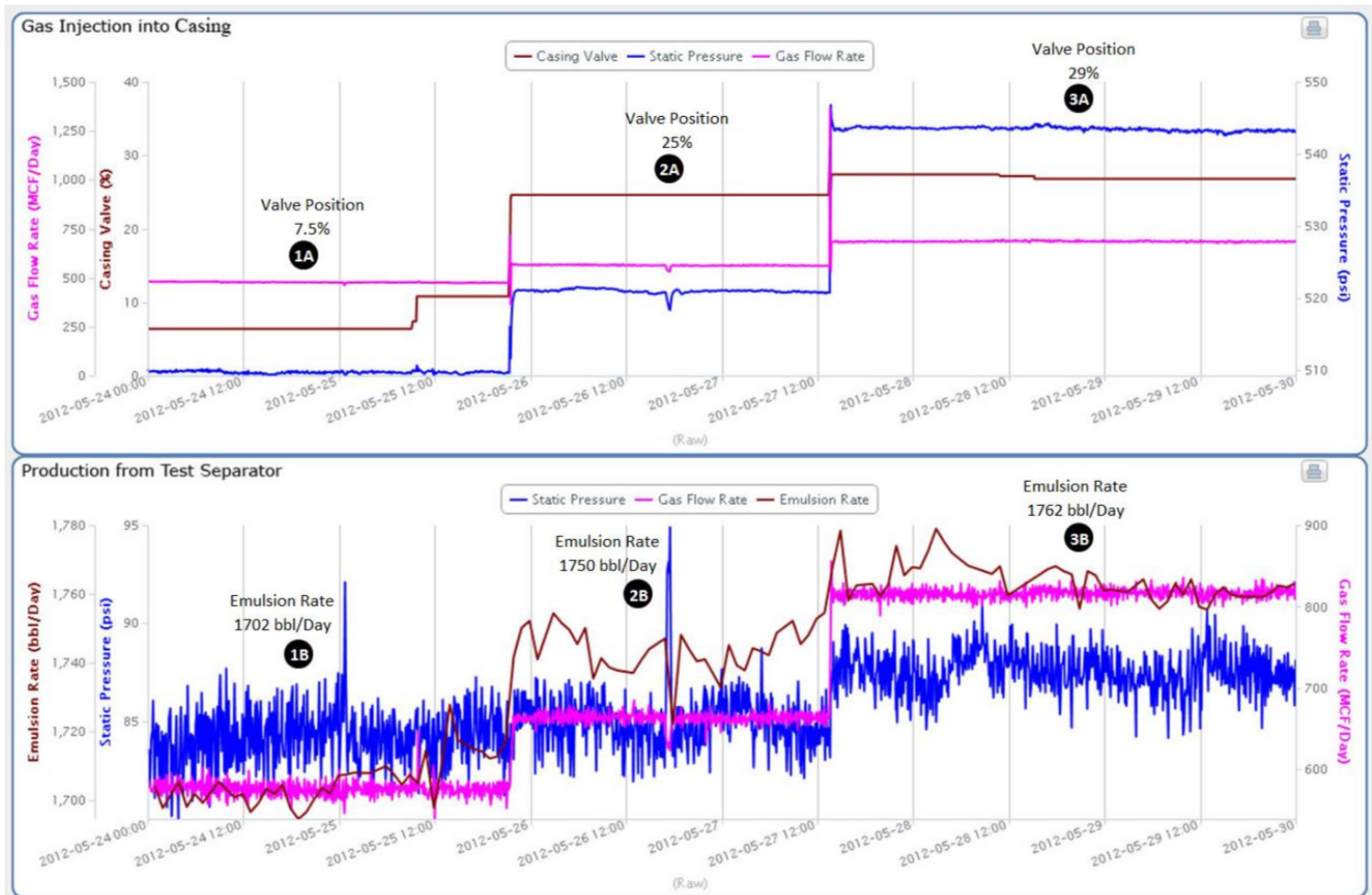
SOLUTION

Figure 1 below was produced using DeltaV SaaS SCADA to optimize oil production on the offshore platform.

The graphs represent data from a gas lift well (top graph), and demonstrates step increases in the casing valve position (brown), gas lift flow rate (pink) and static pressure (blue) by controlling the choke valve position on the gas lift well.

The resulting production at the test separator (bottom graph). This grants the user the ability to remotely control this process by entering gas flow rate (automatic mode) and casing valve position (manual mode) set points.

The second graph shows the resulting static pressure (blue), gas flow rate (pink) and emulsion rate (brown) at the test separator as the gas lift well gas flow rate and static pressure increases.



- 1A Gas lift well initial step for baseline data: Casing Valve Position (7.5%), Gas Flow Rate (490 mcf/Day) and Static Pressure (511 psi)
- 1B Test separator production result of initial step: Emulsion Flow Rate (1702 bbl/Day), Gas Flow Rate (590 mcf/Day) and Static Pressure (81 psi)
- 2A Gas lift well 2nd step with gas lift increase: Casing Valve Position (25%), Gas Flow Rate (610 mcf/Day) and Static Pressure (530 psi)
- 2B Test separator production result of 2nd step: Emulsion Flow Rate (1750 bbl/Day), Gas Flow Rate (680 mcf/Day) and Static Pressure (85 psi)
- 3A Gas lift well 3rd step with gas lift increase: Casing Valve Position (29%), Gas Flow Rate (730 mcf/Day) and Static Pressure (543 psi)
- 3B Test separator production result of 3rd step: Emulsion Flow Rate (1762 bbl/Day), Gas Flow Rate (815 mcf/Day) and Static Pressure (88 psi)

Note: All values are approximations.

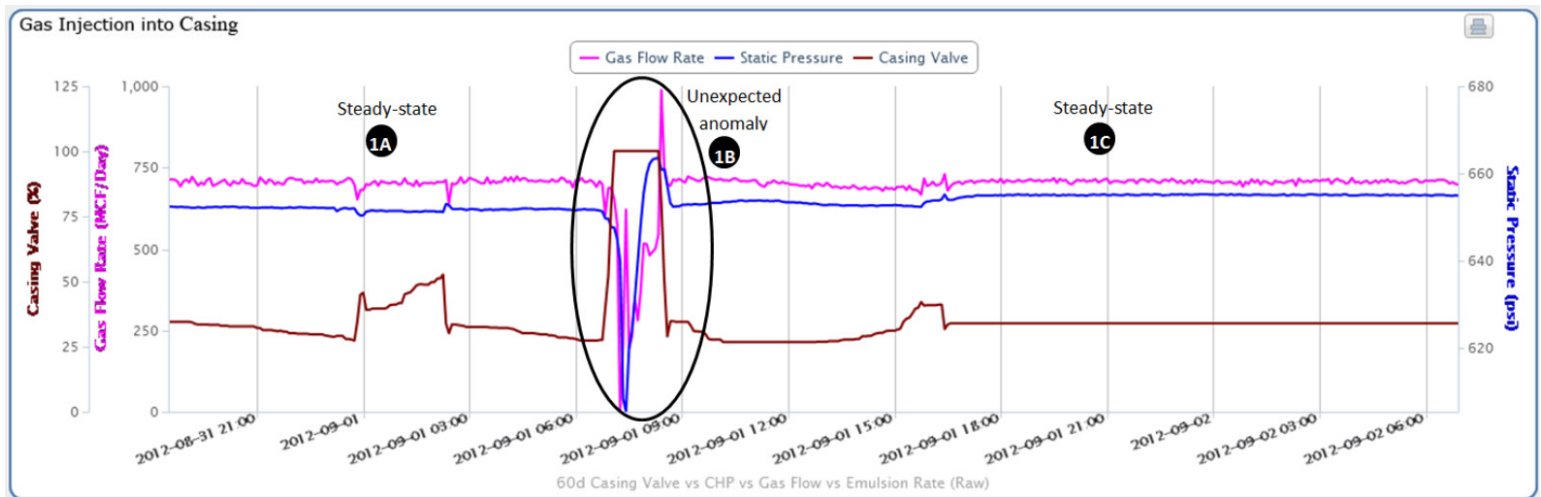
SOLUTION

Analyzing the graphical data, one will find that there is a direct correlation between the increase in gas lift flow rate and static pressure at the gas lift well and the resulting static pressure, gas flow rate and emulsion rate at the test separator. When optimizing production, this data can be used to find an optimal gas lift flow rate to produce a desired amount of emulsion. Using DeltaV SaaS SCADA, a user can easily generate a report or trend, make informed production decisions and then immediately implement them through remote control.



Figure 2 below was produced using DeltaV SaaS SCADA. It's an example of automated gas lift, leading to steady-state production. The graph represents data from a gas lift well running under normal operating conditions after the optimal gas lift flow rate has been determined.

The graph shows casing valve position (brown), gas lift flow rate (pink) and static pressure (blue) while the system is running in automatic mode with a flow rate set point of approximately 740 mcf/Day. The circled area on graph (1B) shows an unexpected anomaly in the production process in which there was a sudden decrease in static pressure, resulting in the reduction of gas lift flow rate. In this case, it fell to 0 mcf/Day. With the system running in automatic mode, this anomaly was immediately realized and the valve position opened to 100% to increase the gas lift flow rate in an attempt to rectify the issue. Once gas lift flow rate and static pressure began to increase, the valve position adjusted accordingly until steady-state gas lift was reached once again.



- 1A Steady-state gas lift
- 1B Unexpected anomaly in production process
- 1C Recovered steady-state gas lift

The advantage of this functionality is that subsequent to an unexpected event during production or during well start-up, the optimal gas lift flow rate will be reached quickly. Without automation, recovery will take significantly longer, which can lead to a loss in production. By implementing DeltaV SaaS SCADA with automated gas lift flow rate, the end-user will realize optimized steady-state production.

SUMMARY

The implementation of DeltaV SaaS SCADA for an offshore platform empowered the end users to meet their production objectives.

High reliability and availability of secure, remote production data contributed to this realization. The E&P company quickly realized numerous technical and business benefits of utilizing SaaS SCADA.

	Production Increase (bbl)
Day	694.8
Week	4863.6
Month	20,844.0
Year	253,602.0

These benefits included optimizing their well testing process through remote control of gas lift and production analysis through easily accessible reports, analytics and trends on DeltaV SaaS SCADA. Enabling the producer to gain well test results that were improved through remote production optimization.

Implementing a closed-loop control system with automated gas lift, the producer gained confidence in their production processes maintaining steady-state performance. Even in the event of an unexpected anomaly such as a sudden decrease in gas lift flow rate, the system will react instantaneously and automatically adjust valve positions until steady-state production is reached once again.

This case study exemplifies how DeltaV SaaS SCADA can be a lucrative investment for producers and allow for faster, easier realization of production goals. SaaS SCADA enabled the producer to gain actionable data, optimize gas lift, increase operational efficiency, learn new skills, increase safety and ultimately increase oil production and profits on their offshore platform.



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