



CASE STUDY



Promoting Continuous Improvement by Increasing Adherence to Slip to Slip Connection Processes

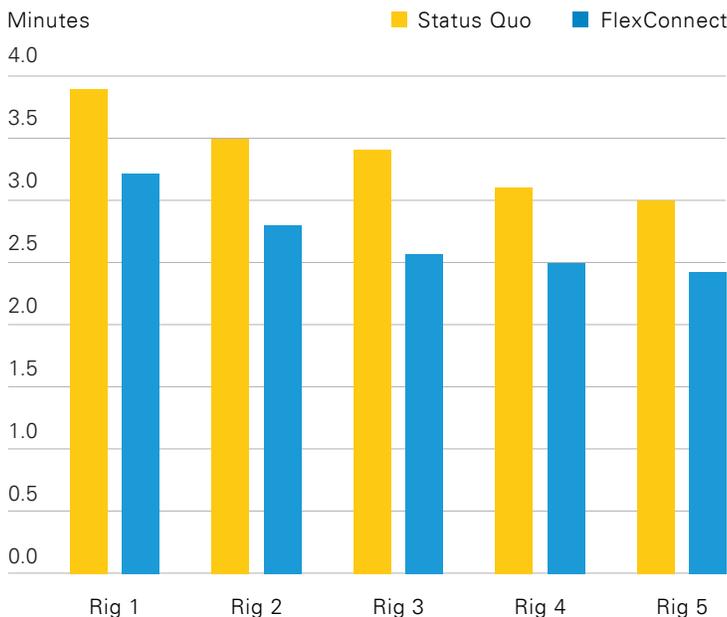
OVERVIEW

With an industry focus on minimizing rig flat times and improving efficiency, operators are seeking real time feedback on connection performance.

H&P recognizes the need for FlexConnect™; instant and quantifiable slip to slip results. Once installed on the rig, operators can see immediate connection time improvement with minimal intervention.

FlexConnect saves the operator’s time and minimizes risk by reducing slip to slip connection times.

FlexConnect tracks the driller’s slip to slip connection performance on the Human Machine Interface (HMI) screen. This promotes continuous improvement and adherence to slip to slip connection processes.



RESULTS

Increases Time Savings

- 21% reduction in slip to slip connection times

Mitigates Risk

- Less time with pumps off means reduced connection gas influx and reduced risk of stuck pipe

Inspires Ownership & Accountability

- Increased performance competition between crews promotes a performance-minded culture

Operators have the ability to monitor slip to slip progress in a standardized report, helping to identify trends and implement plans for continuous improvement.

Over a six-month time period, slip to slip times were compared on five rigs before and after their FlexConnect implementation. Each rig showed significant improvement over time, noted by the blue columns.



FlexConnect Visualization—Who Sees What?

Rig HMI View

Day and night tour connections allow for sharing of best practices, resulting in crew to crew consistency

DAY	Average	2min 21.36 sec
StartTime	End Time	Time
2/7/2018 5:57:22 PM	2/7/2018 5:59:58 PM	2min 36sec
2/7/2018 4:47:31 PM	2/7/2018 4:52:12 PM	4min 41sec
2/7/2018 3:55:52 PM	2/7/2018 3:58:00 PM	2min 8sec
2/7/2018 3:16:45 PM	2/7/2018 3:18:49 PM	2min 4sec

Breakdown of individual connections provides driller with real time performance feedback

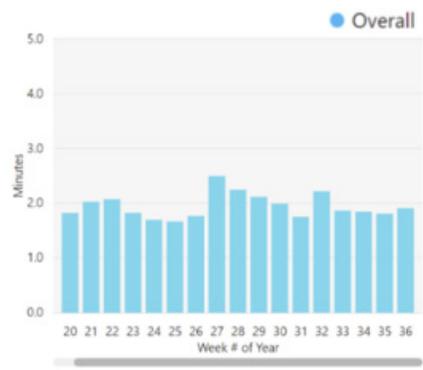
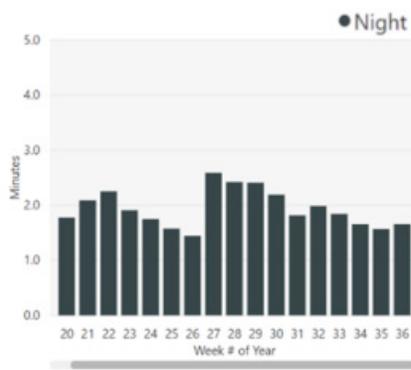
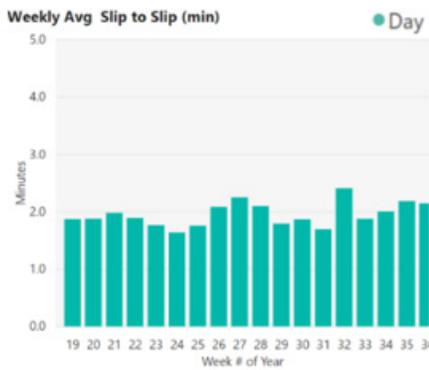
NIGHT	Average	2min 36.5 sec
StartTime	End Time	Time
2/8/2018 1:21:36 AM	2/8/2018 1:23:59 AM	2min 23sec
2/7/2018 11:33:55 PM	2/7/2018 11:36:19 PM	2min 24sec
2/7/2018 9:41:01 PM	2/7/2018 9:43:35 PM	2min 34sec
2/7/2018 7:22:08 PM	2/7/2018 7:25:13 PM	3min 5sec

Previous 24-hour individual slip to slip times

Operator Report

Automated report displays slip to slip progress

Allows for identification of connection KPI trends



Day_Night	Average of Connection Time (min)	Count of Connection Time (min)	Earliest Connection Start
Night	1.92	823	5/9/2018 12:01:43 AM
Day	1.93	868	5/9/2018 6:02:55 AM
Total	1.92	1691	5/9/2018 12:01:43 AM

Overall Slip to Slip
1.92

Provides overall slip to slip average for selected time frame



* PAST PERFORMANCE IS NOT A GUARANTEE OF FUTURE RESULTS. ANY STATEMENTS REGARDING PAST PERFORMANCE ARE NOT GUARANTEES OF FUTURE PERFORMANCE AND ACTUAL RESULTS MAY DIFFER MATERIALLY.

ABOUT US

We're rated 1st by our customers 11 years in a row because no one designs, fabricates, and operates automated drilling performance packages as well as we do. H&P reduces risk, lowers total cost of operations and accelerates well programs better than anyone. Our long-standing commitment to safety reinforces the importance we place on people and our ability to recruit and retain top talent to serve our customers.