

NOV's drilling automation solution delivers well 20% faster

Integrated NOVOS/Kaizen/Performance Center offering improves drilling performance and reduces well delivery time for Middle East operator.

Background

Today's drilling campaigns require operators to deliver wells safely, consistently, in less time, and at lower costs. While experienced drilling crews can optimize performance of individual parts of the well construction process, sustaining those gains for the entire well is challenging. Variability in drilling execution, changing downhole conditions, and inconsistent operating practices can all extend well delivery times and increase costs.

To improve drilling efficiency and shorten well construction time, an onshore operator in the Middle East sought an integrated automation solution that could optimize drilling performance in real time, automate repeatable workflows, and consistently replicate best performance across its drilling campaign.



Case study facts

Application: Automated drilling solution for land rig

Location: Middle East

Challenge: Reduce well delivery time by improving drilling efficiency and standardizing high-performance execution across the well construction operation

Solution: Integrated solution comprising the Kaizen intelligent drilling optimization, NOVOS automation system, and NOV's Performance Center

Key results:

- 20.2% faster overall well delivery
- 61 hours saved versus planned benchmark
- 19% increase in average rate of penetration
- 8.16 hours saved during drilling connection transitions

Solution

NOV deployed an integrated drilling automation service combining the Kaizen™ intelligent drilling optimizer, the NOVOS™ automation system, and remote operational support from the NOV Performance Center.

The AI-powered Kaizen drilling optimizer continuously evaluated drilling performance in real time, comparing it with offset well data while adapting to changing wellbore conditions. When running in control mode, Kaizen continuously learned from wellbore conditions and automatically generated optimized drilling setpoints.

These setpoints were sent directly to the NOVOS automation system, which executed drilling activities without manual intervention. Designed to respond much like human reflexes, NOVOS automated repetitive drilling tasks and continuously adjusted parameters including weight on bit (WOB) and rotations per minute (RPM) to maintain optimal drilling performance.

Experts at the NOV Performance Center remotely supported the field-deployed automation systems. Using real-time data analytics and operational expertise, the Performance Center monitored drilling and pipe-handling operations, identified additional optimization opportunities, and provided proactive recommendations that helped maximize efficiency and sustain higher levels of operational performance.

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Results

The integrated automation service consistently optimized drilling performance throughout the well, enabling the operator to complete the well more than 20% faster than its planned benchmark.

The combined capabilities of NOVOS, the Kaizen drilling optimizer, and the NOV Performance Center increased the average rate of penetration (ROP) by 19% compared with benchmark wells, reducing drilling time by 53.2 hours.

Automation also streamlined drilling connections. Weight-to-slips transition time was reduced by 4.27 hours, while slips-to-weight transition time improved by an additional 3.89 hours, minimizing nonproductive time between drilling intervals. 21% improvement on W2S and 43% on S2W. Or 24% overall.

Overall, the integrated solution enabled the operator to complete the well in less than 242 hours, compared with the planned benchmark of 303 hours—saving 61 hours and delivering the well 20% faster than the operator’s established land well construction benchmark.

Learn more about NOVOS here: nov.com/novos

Learn more about Kaizen here: [IDO](#) | [Intelligent Drilling Optimizer](#) | [Kaizen](#) | [NOV](#)

Hole Size	Automated Footage (Kaizen In Control)	NOVOS On-bottom ROP (ft/hr)	Benchmark Rop (ft/hr)	Saved hours (hr)	Actual NOVOS W2S (min)	Benchmark W2S (min)	W2S NOVOS Count	Saved hours (hr)	Actual NOVOS S2W (min)	Benchmark S2W (min)	S2W NOVOS Count	Saved Hours (hr)	Total Saved Hours (hr)
28"													
22"													
16"	1604	139	147.73	-0.68	5.72	7.61	12	0.38	4.48	2.28	12	-0.44	-0.74
12"	5366	72	58.33	17.47	12.39	11.50	50	-0.74	2.43	4.83	60	2.40	19.12
8.375"	3432	46	37.97	15.78	13.35	18.87	34	3.13	2.34	4.56	36	1.33	20.24
5.875"	981	18	13.06	20.61	15.29	23.32	9	1.50	2.37	5.96	10	0.60	22.72
11383			Total saved Drilling Hours	53.18	Total saved W2S Hours			4.27	Total saved S2W Hours			3.89	61.34
Total Actual Hours			241.6										
Total Benchmark Hours			303.0										
Total Saved Hours			61.3										
% Improvement			20.2%										

