Case Study

Rig Cadence and Automation Lifecycle Management

Improve automated drilling and pipe handling performance on two rigs in the North Sea

Case study facts

Location: North Sea

Rig or customer: Confidential

Time frame

- January 2021 to December 2021

Challenge

Implementing automation technology is a significant change and journey for drilling contractors, operators, and original equipment manufacturers (OEM). Once the drilling and pipe handling automation systems on two drilling rigs in the North Sea were implemented, their continuous utilization and operational performance (human, software, and equipment) needed to improve.

Solution

The Automation Lifecycle Management (ALM) methodology covers all necessary services to achieve and sustain performance goals. The ALM methodology focuses on continuous improvement through an iterative approach covering the different aspects of automation, including machines, software, and human factors, while creating accountability for the drilling contractor, operator, and OEM. The core ALM services cover software maintenance, remote technical support, performance monitoring, performance consultancy, and program management.

Part of ALM is Rig Cadence™, a comprehensive micro-key performance indicator (KPI) analytics tool used to measure process, machine, and human performance. This project's KPIs included automation system utilization, drilling and tripping connection times (W2W), and tool/machine sequence times. The KPIs were analyzed and the root cause of performance deficiencies and/or improvement opportunities were categorized as human factors, machine/tool maintenance, and software.

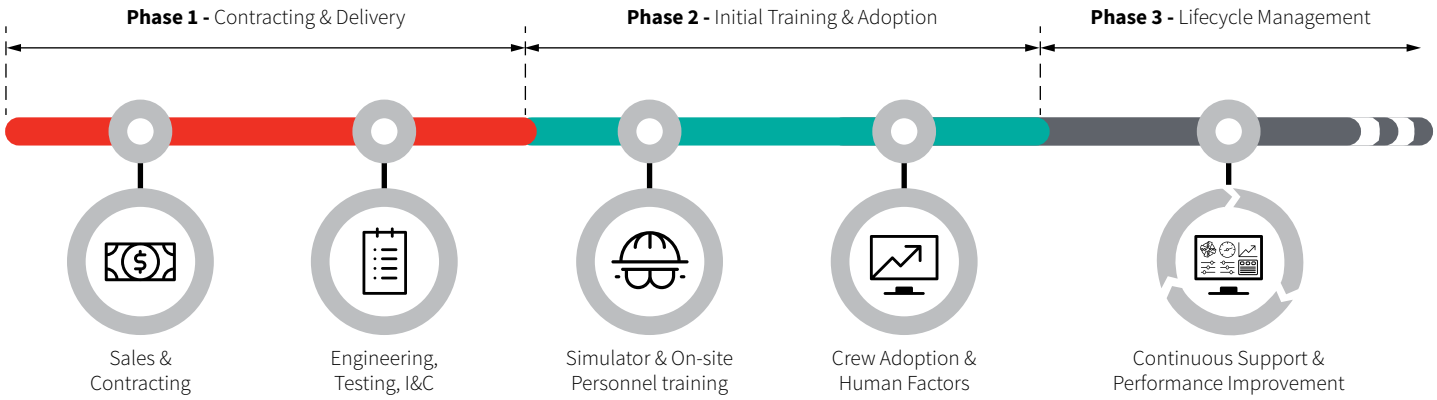
Results

Throughout the execution of the ALM methodology, program efforts cycled continuously. Human performance drove opportunities for training, competent personnel drove opportunities for software and tool improvement through utilization, and software improvement drove opportunities for human improvement. This cycle continued as each performance category improved and evolved, driving automation forward for the drilling contractor, the well operator, and the OEM – improvement through iteration.

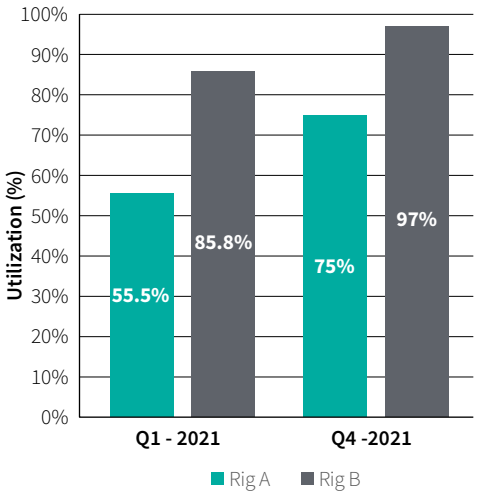
During this effort, the drilling contractor and well operator improved their knowledge and competency of automation systems, enabling self-sufficient crews and cultures of success with high system utilization.

Throughout the program, both rigs received software updates to their automation systems that included improvements in the user interface, optimization of automated sequences, enhancements to prior functionality, and patches for known issues. Rig Cadence identified a problem in the automation system sequence, preventing the Roughneck from running more efficiently, resulting in a software patch for the automation system.

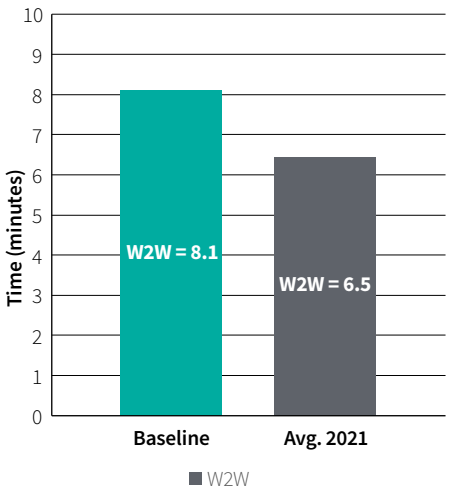
The two rigs have surpassed the operator's goals and are now among the highest performing rigs across its fleet. Automation system utilization improved 35% on Rig A and 13% on Rig B. Overall, W2W performance times decreased 19% on Rig A and 28% on Rig B.



Automation Implementation Phases



Automation System Utilization Improvement



Rig A, Overall W2W Performance Improvement

Rig B, Overall W2W Performance Improvement