DATA SHEET

HALLIBURTON

Cementing equipment

AUTOMATION AND REMOTE OPERATIONS | SURFACE EQUIPMENT AUTOMATION

# LOGIX™ automated cementing service

Remotely controlled, autonomous, offshore cementing improves operational efficiency and consistency

## FEATURES

- Remote operation: Safe-zone and off-site control with secure vSAT access
- Real-time monitoring: Live job data, alarms, and emergency controls
- Robust automation: Programmed with decades of Halliburton best practices and remotely activated automation works with no connectivity impact
- Redundant architecture: Standby server, gateway design for high availability
- Secure and scalable: Ethernet/profibus backbone with modular deployment
- Built-in safety: Interlocks, emergency stop/start, and compliance logic

## BENEFITS

- Onshore operators can remotely control the offshore cement operation, monitor data, and perform diagnostics
- Improved operational efficiency
- Consistent cement delivery
- Operational flexibility
- Improved safety and reliability

## Overview

Offshore drilling is costly and can expose personnel to extreme conditions far from support facilities. It can require expensive facilities, air or boat transportation, and high-specification equipment. A successful remote, autonomous, offshore cementing solution must overcome the risks of high-pressure pump and cement operations.

Halliburton began the journey toward autonomous cement operations decades ago with the transition of the operator from the high-pressure, high-noise environment of the cement unit (especially during well component and BOP tests) to a control room on the rig. This reduced operator exposure to noise, chemicals, and vibration, and created a safer work environment. Since then, Halliburton has successfully executed thousands of operations this way.

LOGIX™ automated cementing marks the next milestone in automated offshore cement operations. This service allows full remote control of an offshore cement unit from onshore and combines remote control functionality and automation to help improve operational efficiency, execution, and flexibility.

## Automated cementing is faster and smarter than traditional offshore cementing

Automated actuators and programmable logic controllers (PLCs) connect the offshore cement unit's manual controls, valves, and ancillary equipment to a single human machine interface (HMI) during a LOGIX automated cementing operation. This HMI is replicated onshore and allows operators in the remote operations center (ROC) to remotely perform the same functions.

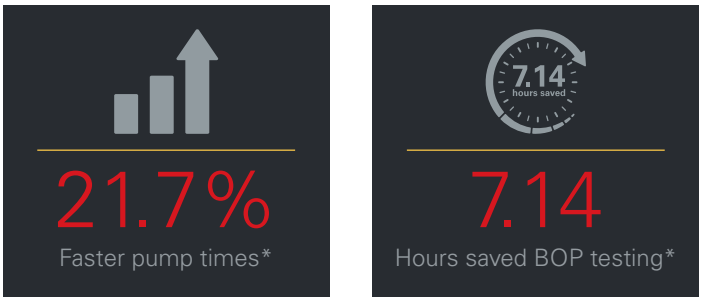
The main challenge with remote offshore equipment operation is maintained communication. Satellite-linked networks often experience limited bandwidth and intermittent connectivity loss. LOGIX automated cementing permits a digital connection to the cement unit's control system. The onshore supervisor controls the offshore operation and monitors data from the unit's controller, to include but not limited to, cement density, tub level, liquid additive rates and concentrations, flow/fluid path diagram, and live video of the operation.

## Improved operational efficiency and consistent delivery through automation

Connectivity loss can jeopardize operational execution and safety. Automation in the LOGIX automated cementing service mitigates these challenges and helps facilitate operational efficiency and consistency. Conventional cement operations require hundreds of actions. LOGIX automated cementing consolidates them into fewer than five automated steps. Once programmed, the cement unit automatically executes each step, monitored by the onshore supervisor. As a security measure, the initial secure data connection requires manual authorization from offshore to verify the operating company and rig are ready to transition control to the onshore operator.

Once authorized to begin, the service allows alternating between automatic and manual mode and frees the operator to oversee critical parameters, such as cement rate and pressure, to improve service quality. It also reduces time to test BOPs and improves job placement time through quicker stage transitions and mixing operations. LOGIX automated cementing can analyze real-time slurry/mix rate inputs faster than humans to maximize rig uptime.

The cement unit offshore houses the automated programming. This safeguards the operation from connectivity variances and eliminates latency issues to commands from shore. If communication with the onshore supervisor is lost, the cement operation continues as programmed. The LOGIX automation has the capability to activate failsafe mode in the event it cannot self-diagnose a problem and will move itself into a safe state, initiate a washup sequence, and notify the rig to resume control. Decades of Halliburton experience and best practices are programmed into the platform to help execute a safe, consistent, and quality operation every time.




*During an eight well case study.

## Operational flexibility

LOGIX automated cementing service is adaptable to diverse operational needs and runs from an onshore ROC, a rig-based cementing room, or an optional emergency operator offshore. The potential for offshore personnel to perform additional tasks, such as running liners or other service tools, can further improve operational efficiency. Automation is custom configured, and each option provides repeatable, consistent results.

## Improved operational efficiency, execution, and flexibility in offshore cement operations

LOGIX automated cementing service has facilitated more than 450 successful cement operations since 2020. Proven results, such as zero non-productive time (NPT), 24% rig time savings through faster automated mixing, and efficient operations demonstrate the platform's reliability, consistency, and efficiency.

**For more information, contact your local Halliburton representative or visit us on the web at www.halliburton.com**



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