



Get predictable, real-time, remote connection integrity

Flora automated connection integrity service

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The Flora™ automated connection integrity service from Baker Hughes offers automated premium pipe makeups using artificial intelligence (AI) for decision making and real time remote data transfer.

PREDICTABLE

The Flora automated connection integrity service automates the final makeup and breakout of premium pipe connections and ensures all connections are made up to thread original equipment manufacturer (OEM) standards. Because the system is automated, dependency on the operator or the subjective opinion of the computer technician to spot anomalies is eliminated. With the push of a button, the system performs the entire makeup using automated processes and onboard sensors.

An automated equipment workflow allows you to focus on higher value activities, while ensuring tubular running service operations are safe, efficient, reliable, and repeatable. When you have an automated workflow, you can:

- Spend less time waiting on personnel to decide what operation is next
- Run sequential operational steps of the job in parallel allowing you to improve on KPI's

Protect your well's integrity and never miss an out-of-spec makeup

Our AI system has been trained with decades of data and scanned makeups for anomalies according to the thread OEM's running procedures, to reliably maintain complete well integrity. The service allows for more accurate execution by importing parameters from our integrated Baker Hughes Job Planner Software. This software intuitively plans for rig, equipment, and pipe parameters, so that the job can be executed to the most up-to-date plan the first time. Settings and configuration of torque-turn software are downloaded and verified with the customer rather than being manually entered at the rig site.

Get precise torque application and well integrity throughout the string with software-controlled makeup speed

Computer-controlled speed compares the power tong's rotation to the given connection's max running and makeup speeds without depending on a skilled operator to maintain consistency throughout the job. The Flora service monitors the power tong speed throughout the makeup process and controllably

APPLICATIONS

- Deepwater
- High tech/6th and 7th generation drilling rigs
- Premium casing strings
- Landing strings
- Chrome pipe
- Completion strings

BENEFITS

- Detects anomalies in thread make-ups that human operators may miss increasing predictability and precision
- Ensures tubular running service operations are safe, efficient, reliable, and repeatable through automated equipment workflows
- Allows for more accurate execution by importing parameters from our integrated software
- Eliminates hard stops that can jeopardize your premium connection and well integrity
- Eliminates risk by locating the operator out of the red zone
- Reduces personnel on board (POB) and its associated footprint and carbon emissions

reduces it until the connection is completely made up.

A smooth makeup speed gives you:

- More precise torque control
- Prevents abrupt speed changes that can impart residual energy into threads and seals, resulting in damaged or potentially compromised connections
- Reduces breakouts, which can result in damage and expense

The entirety of equipment and personnel selection, planning and execution, is handled through one integrated application ensuring every aspect of the job is aligned and verified.

REAL-TIME, REMOTE

Real-time data transfer capabilities allow POB reduction with the thread representative digitally approving graphs from any onshore location. Thread inspectors can now perform traditional rig site graph inspection from wherever they work around the world, which helps reduce carbon costs and logistical expenses. The Flora service is Wi-Fi enabled and offers hands-free, remotely operated, and automatic speed-controlled makeups allowing operations from the driller's cabin and away from risky rig-floor red zones. Effective and intuitive operation also allows the equipment operator to concurrently run the torque-turn software from a single, small-footprint box. This eliminates the need for a separate control system and torque turn computer at the rig site, reducing footprint with fewer components to rig up.

Flora™

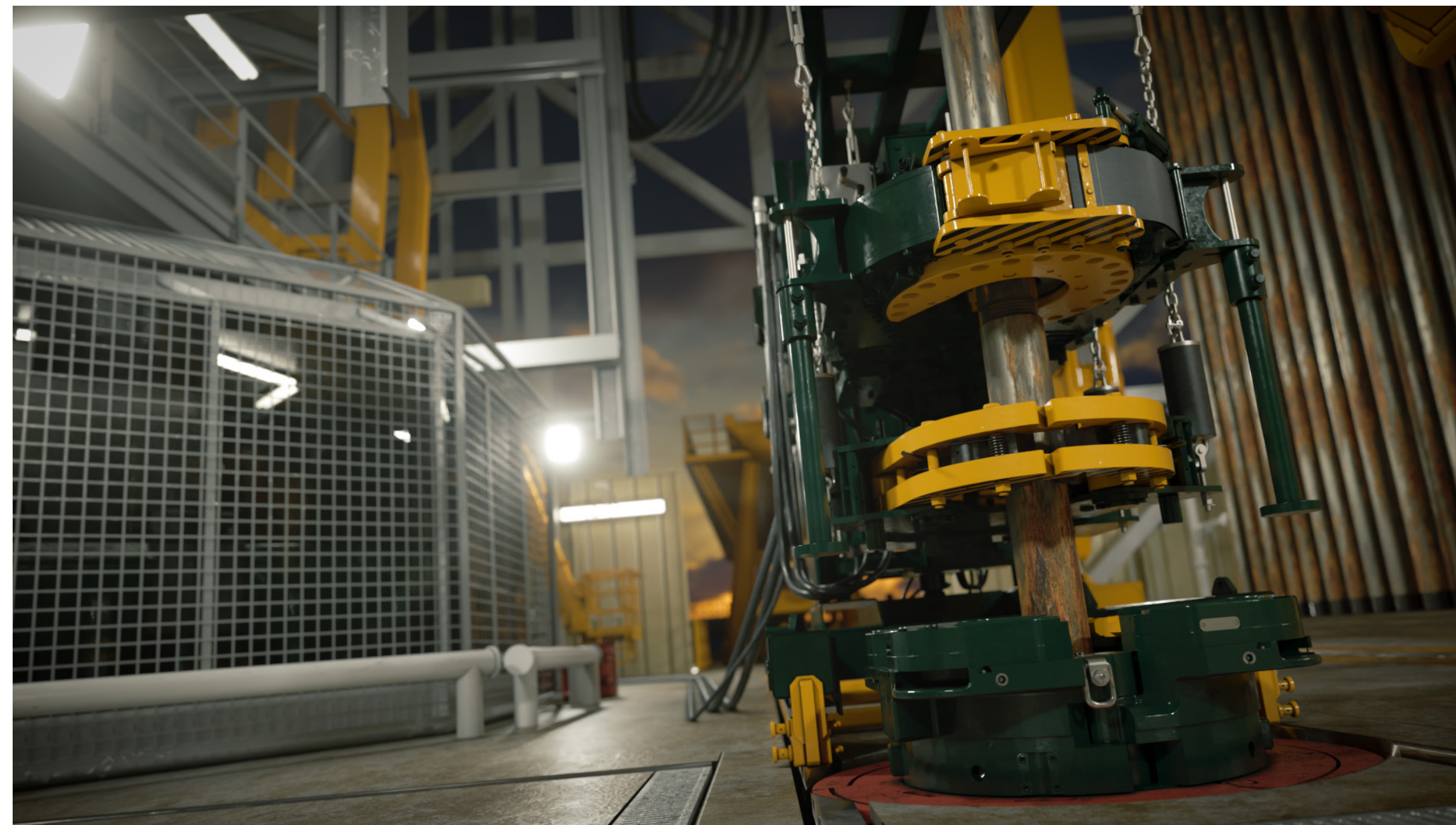
automated connection
integrity service

TYPICAL PROPERTIES

Power tong (mechanized)	8 5/8-in.	14-in.	22-in.
Pipe range (in.)	2 3/8 - 8 5/8	7 - 14	10 3/4 - 22
Maximum torque (ftlb)	85,000	100,000	150,000

TYPICAL LOADOUT

	LeadHand 3.1	14-in. power tong	Tracks
L x W x H (ft)	102 x 66 x 114-in. (2591 x 1676 x 2896 mm)	80.4 x 55.2 x 60-in. (2042 x 1402 x 1524 mm)	Narrow 190.5 x 65 x 7-in. (4839 x 1652 x 178 mm)
			Wide 190.5 x 95 x 7-in. (4839 x 2413 x 178 mm)



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