Flora automated connection integrity system

Intelligent recording and analysis of torque turn data for every connection

Applications

- Offshore operations
- Monitor premium and API tubular connection makeups or breakouts
- HP/HT wells where connection integrity is critical
- Accurate and precise torque control and analysis

Features and Benefits

- System improves connection integrity and operational efficiency
- Monitors levels of torque during makeup
  - Prevents over torquing and damage to connections
  - Protects connections and reduces the chance of rejections, failures, and resultant downtime
- Real-time data transmission capable
- Automatic shoulder detection
- Automatic SpeedMaster™ valve and Dump valve outputs
- Import and export approved job plans from shore preventing manual data entry errors
- On-Demand Job Report generation
- Remote control of the Flora™ Leadhand PRO and Flora™ Power Tongs
- CE marked, ATEX, IECEx, AEx Zone 1 Certified

The Baker Hughes Flora™ automated connection integrity system is a next generation automation system for tubular running services (TRS) to measure and control torque turn for all tubular connections. It replaces the legacy torque-turn systems with more advanced diagnostics, automated controls, portability, and remote operation.

Flora automated connection integrity system monitors and analyzes torque, turns, speed of power tongs, and casing running system properties in real time.

Equipped with advanced software services, the torque turn system can prevent under and over torquing, as well as identify torque-turn events during the job, and even securely share data over the internet to connected SMEs globally.

The Flora application is installed on the PLC controller and communicates with sensors on the equipment and the Human Machine Interface (HMI) in real-time. The system can be further integrated into the driller's chair to enable the rig crew to trip and remotely run casing and tubing.

Artificial Intelligence (AI) models have been designed to detect irregular events during an operation. If the AI service is running and configured, there is no additional steps that the user needs to perform to perform the analysis.

After a makeup operation completes, torque turn data for the operation is instantaneously sent to the AI service for analysis. The AI service will analyze the data and provide results to be displayed on the real-time graph. The points requiring further inspection would be intuitively highlighted on the graph, provided with a root cause of the event, and list corrective action for the user's review.

Safety and handling

Flora automated connection integrity system includes equipment that operates under direct supervision of an operator with certain portions fully automated. There are certain hazards to be aware of when automated and/or autonomous equipment is in use, especially when people are working nearby.

Review the Operating Procedure for guidance.

Figure 1 - Flora automated connection integrity hardware

Technical Specifications	
Certification	IECEx Zone 1
Operating temperature	-40°F to +140°F (-40°C to +60°C)
Remote data	Capable
Connectivity requirement	Wireless or LAN
Artificial intelligence	Capable

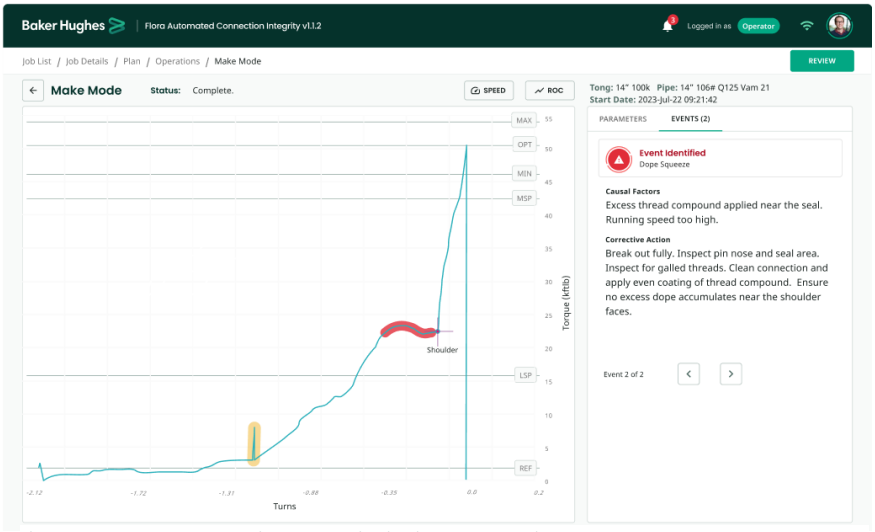

Figure 2 - Torque graph showing automatic highlighted anomalies.