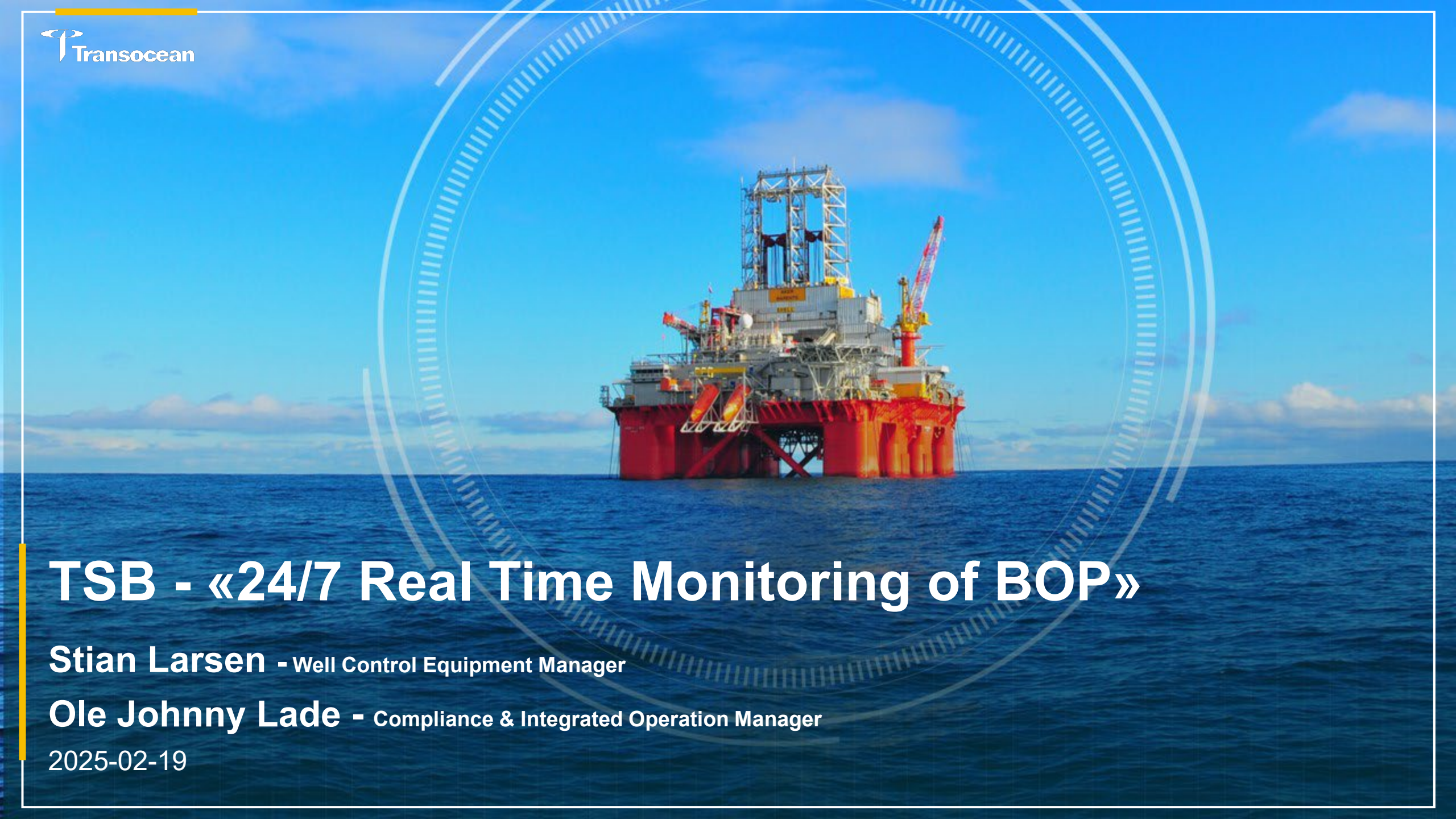


TSB - «24/7 Real Time Monitoring of BOP»

Stian Larsen - Well Control Equipment Manager

Ole Johnny Lade - Compliance & Integrated Operation Manager

2025-02-19

Transocean Spitsbergen

Aquila systemet ble installert ombord på Spitsbergen Oktober 2024.

Trening for personell ombord ble utført i løpet av November 2024.

Systemet vil nå gjennomføres som en ettårig pilot, på initiativ fra Equinor.

(Samtidig testes 3 andre systemer på andre Equinor installasjoner)

Pilot goals:

equinor

DPT:
Increase quality of qualifying barriers

RTM:
Improve operational efficiency by reducing test times & increasing equipment reliability.

Note:

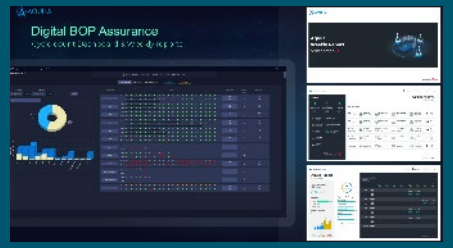
All 3 vendors have different pressure / leak testing criterias, different then ours and are more restrictive. The suppliers have experience of pressure tests with less stringent acceptance criteria that could pass a test even with a leak. It will be evaluated if this is potentially the reason why some liner hangers pass in mud and fail in brine, leaves the underlying question could this have been discovered earlier if a more stringent test criteria was in place.

At the end of the trial, Equinor will revisit its own pressure test qualification criteria.

Real time monitoring (RTM)

Digital pressure testing (DPT)

Digital BOP Assurance (DBA)



Transocean

Real time monitoring (RTM)

AQUILA

Real-time Monitoring

Well Control equipment

Features

01 **24/7 support & Alarms**
Monitoring for all well control equipment, including MPD, during drilling and completion operations

02 **Real time and historic data**
Monitor well operations in real time with Aquila's platform and access data and analytics anytime.

Advantage & Benefits

- *Holistic view of well barriers by integrating real-time drilling, BOP, and MPD monitoring*
- *Enhance equipment performance, safety, and health while reducing downtime*

Real time monitoring (RTM)

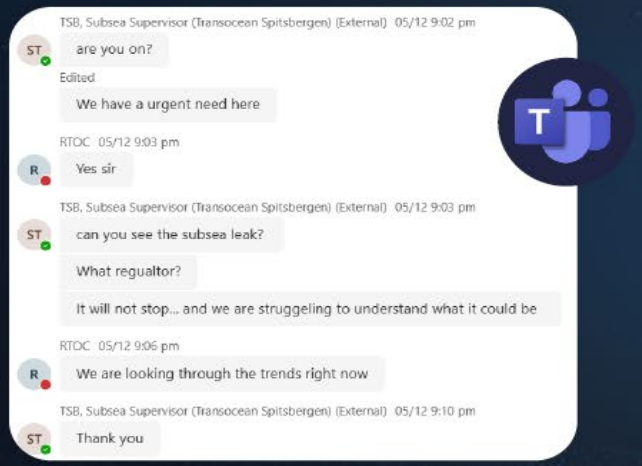
AQUILA

Case Study

Utilization of integrated services (RTOC + Oculus System) for problem detection

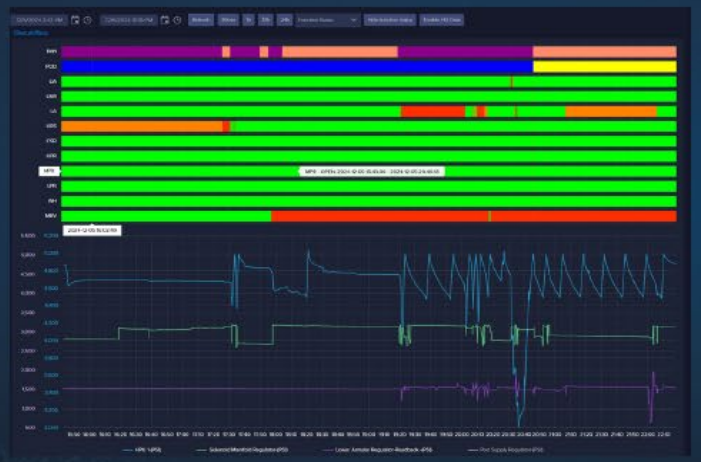
Quick issue resolution minimized leak exposure and system reliability loss

1



On December 5 at 6 PM (Houston time), the onboard Subsea team requested assistance from the RTOC to identify an issue.

2



A significant increase in pump input was identified with an interval of 10-11 minutes

3

After the request, the RTOC contacted Subsea, and they began troubleshooting together to identify the issue. Around 7 PM (Houston Time), after placing the Stack Mounted Accumulators in Block, the Accumulator Trend returned to a more stable pattern

Real time monitoring (RTM)

AQUILA

Other cases

Of abnormal system behavior and operation deviation

Open Under Differential Pressure was detected when the Middle Pipe Ram was opened

Raises team awareness of potential ram damage and functionality loss

Solenoid Manifold Regulator began to decay ~450 PSI every 45 minutes when LIC, UIC, and IGR were opened

Quickly identifies issues in failsafe valves that could impact kick control operations

It was detected that the Diverter flowline seals regulator was below the recommended pressure

Prevents potential leakage through the flowline seal due to low operation pressure

Real time monitoring (RTM)

AQUILA

Health Management

System Health

Features

01 Depletion Rate Technology
Analyzes system health by measuring the leak rate when no functions are activated

02 Regulator Performance
Evaluates regulator cycles to detect abnormalities in the component or its hydraulic circuit

Advantage & Benefits

- *A faster and more effective way to detect leaks in the hydraulic control system*
- *Increases system reliability and prevents control system component failures during operation*

Real time monitoring (RTM)

AQUILA

Health Management

Annular Health

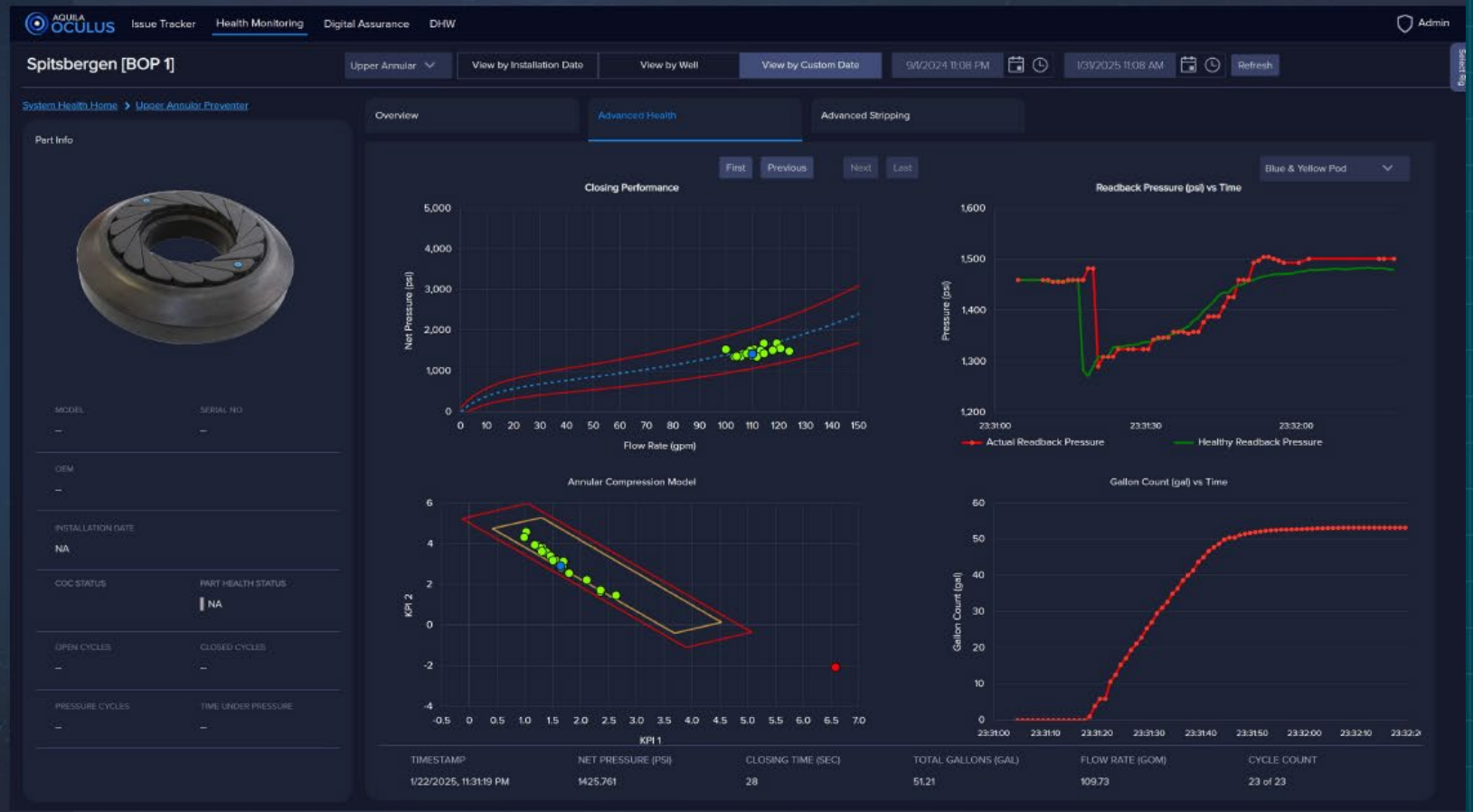
Features

01 Component Overview
Key information on the component's life (cycles, installation, certification, failure history, alerts)

02 Predictive Analytics
Advanced health analysis using mathematical models for pattern recognition & elastomer compressibility

Advantage & Benefits

- *Holistic view of component health, combining unique quantitative and qualitative analyses*
- *Enhances reliability and risk assessments of critical components, reducing failure probability through predictive analysis*



• Digital pressure testing (DPT)

BOP Test Validation Tool for improve performance and compliance

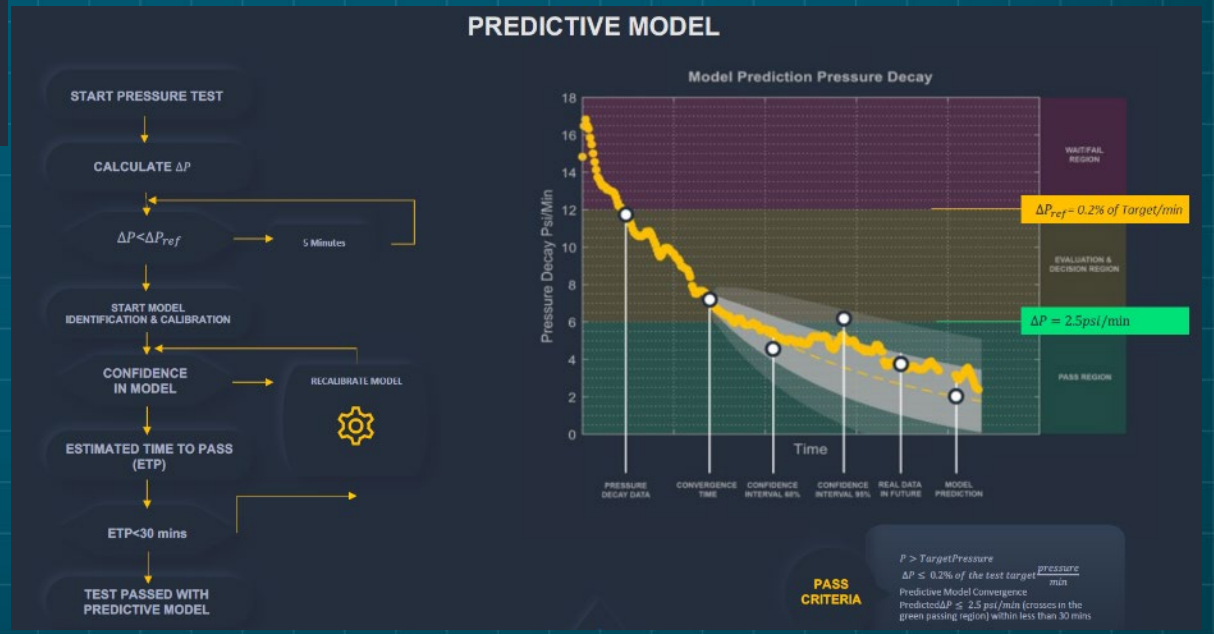
Improve your BOP pressure validate time up to ↑ **40%**

Regulatory agency validation

Ensuring the quality of services and systems

Line up & compliance check

Ensure all tests are running correctly and comply with standards



Digital BOP Assurance (DBA)

AQUILA

Compliance Analysis

Fault Tree Analysis

Features

01 On-demand Fault Tree
Fault trees evaluate failures' impact on BOP availability and compliance

02 Auto-linked to pending issue
Quick response on the impact of a failure concerning API compliance

Advantage & Benefits

- *An evaluation by a third-party system regarding compliance with regulatory requirements*
- *Increased clarity on the failure's impact on the system and, consequently, on operational safety*