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Subsea to Floating: A Unified Field Development Approach

19 – 20 May 2026 | KUALA LUMPUR, MALAYSIA

Subsea Live - Subsea Asset Performance Management

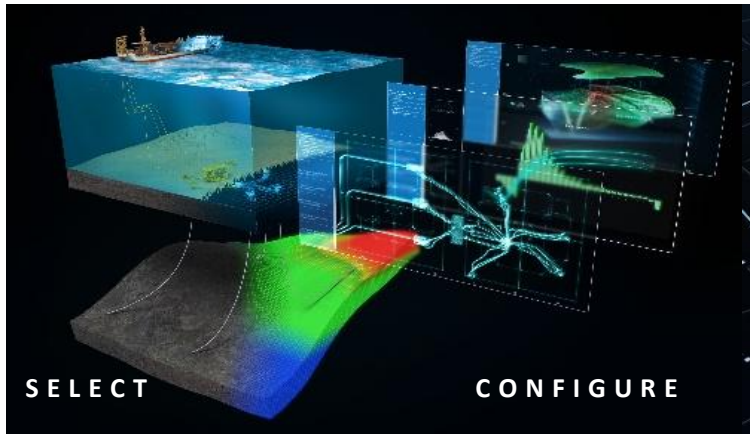
Tomi Entaban, Processing Services Manager Asia

OneSubsea

Subsea Live in Project Lifecycle and Objective

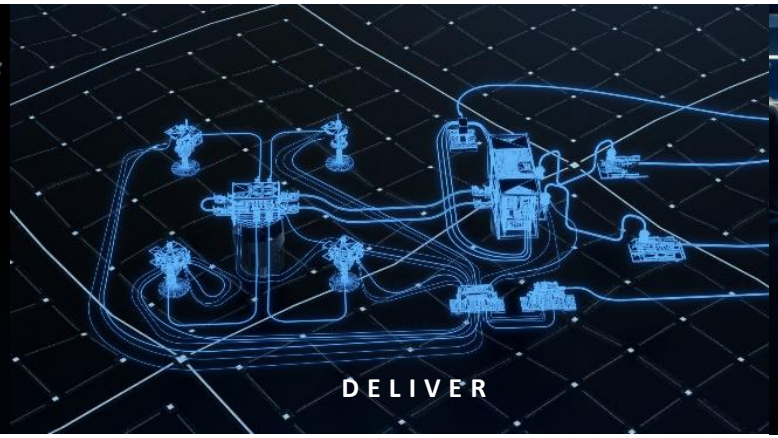
Availability of collaborative and connected performance offerings from planning to operations

Subsea Planner



Optimize concepts & accelerate first oil

Subsea Execution

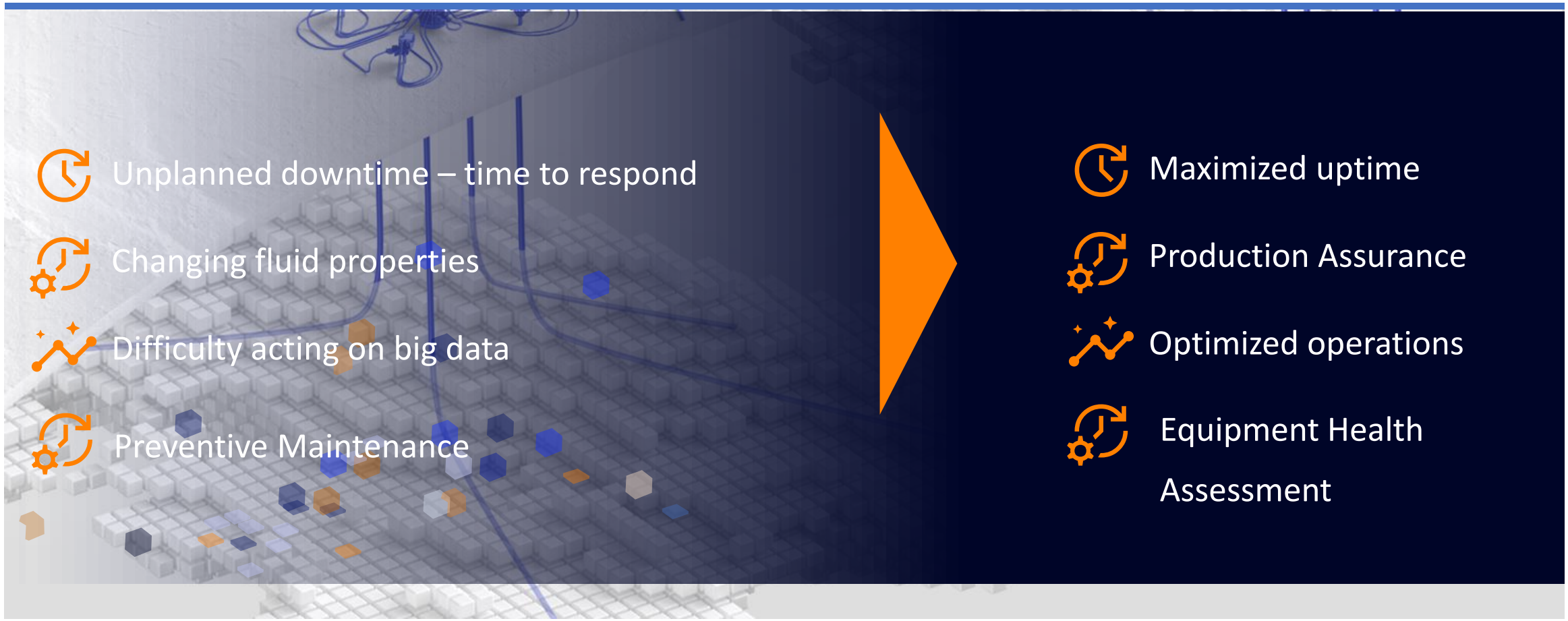


Reduce internal costs & improve visibility

Subsea Live

Maximize asset performance & uptime

Subsea Live Key Drivers



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Evolution of Subsea Digital

2006
FRIEND
Remote Monitoring

2013
FRIEND
Surveillance & Diagnostics

2018
FRIEND
Integrated Subsea Production Management

2022
Subsea Live
Asset Performance Management

2006
First release pump monitoring

2008
First swivel project

2010
First metering project

2015
First Compression project
First SPS project

2019
First VFM and PMS project

2022
Subsea Live released

- + 1.3M days of monitoring
- + 17 years in operation
- + 30 fields
- + 20 clients
- + 400 assets
- + 150k sensors

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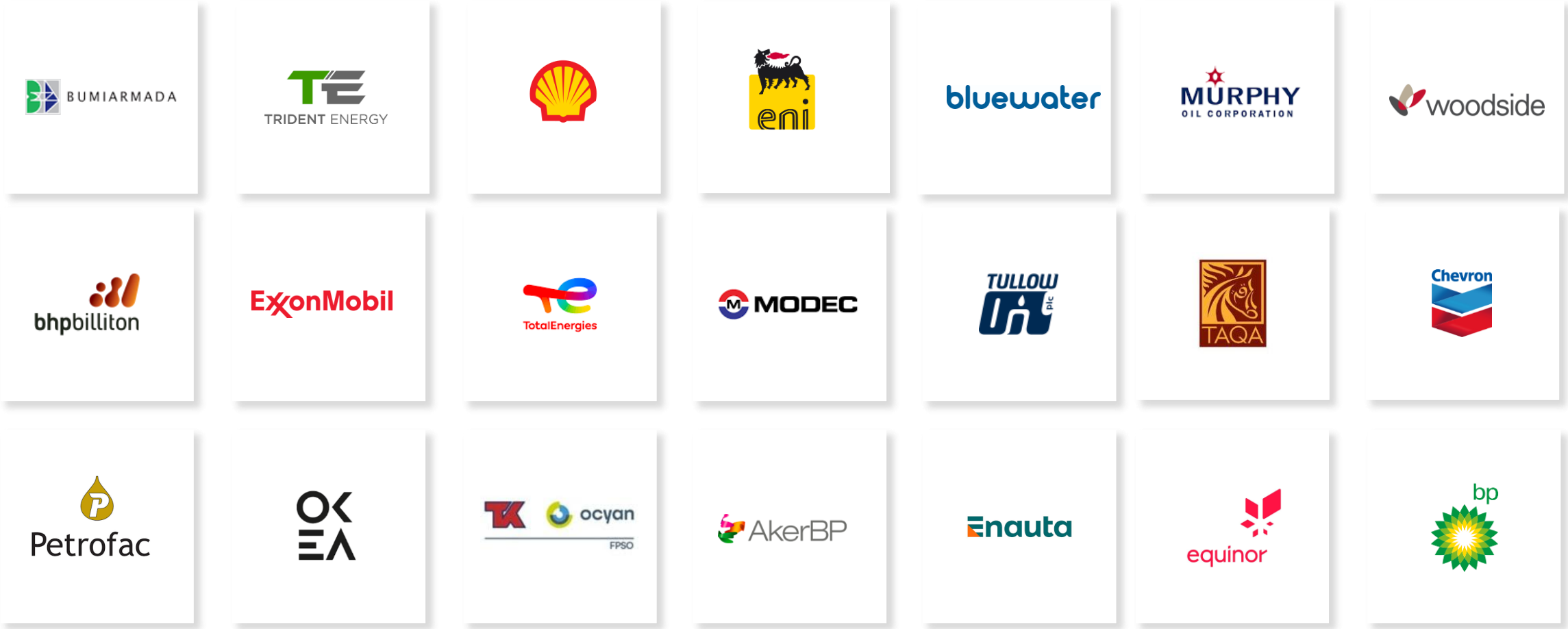
Field Proven Customer Base



Subsea Live Service Structure

Subscription based **monitoring** services

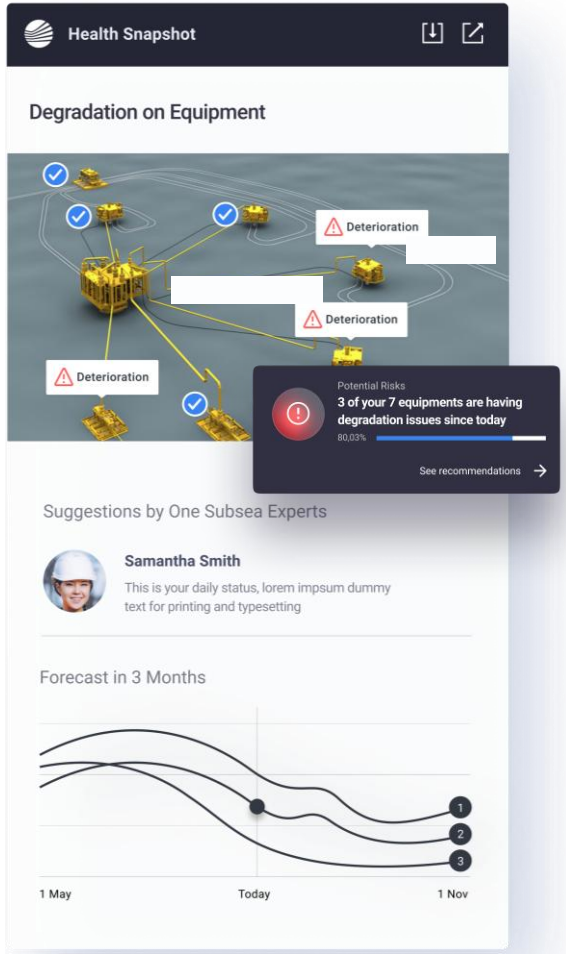
24/7 **access** to engineering support and troubleshooting

Continuous assessment and validation of hardware health and performance

Immediate **notifications** of concerns

Status **reporting,** technical **recommendations** and advice

Secure access SLB DELFI account



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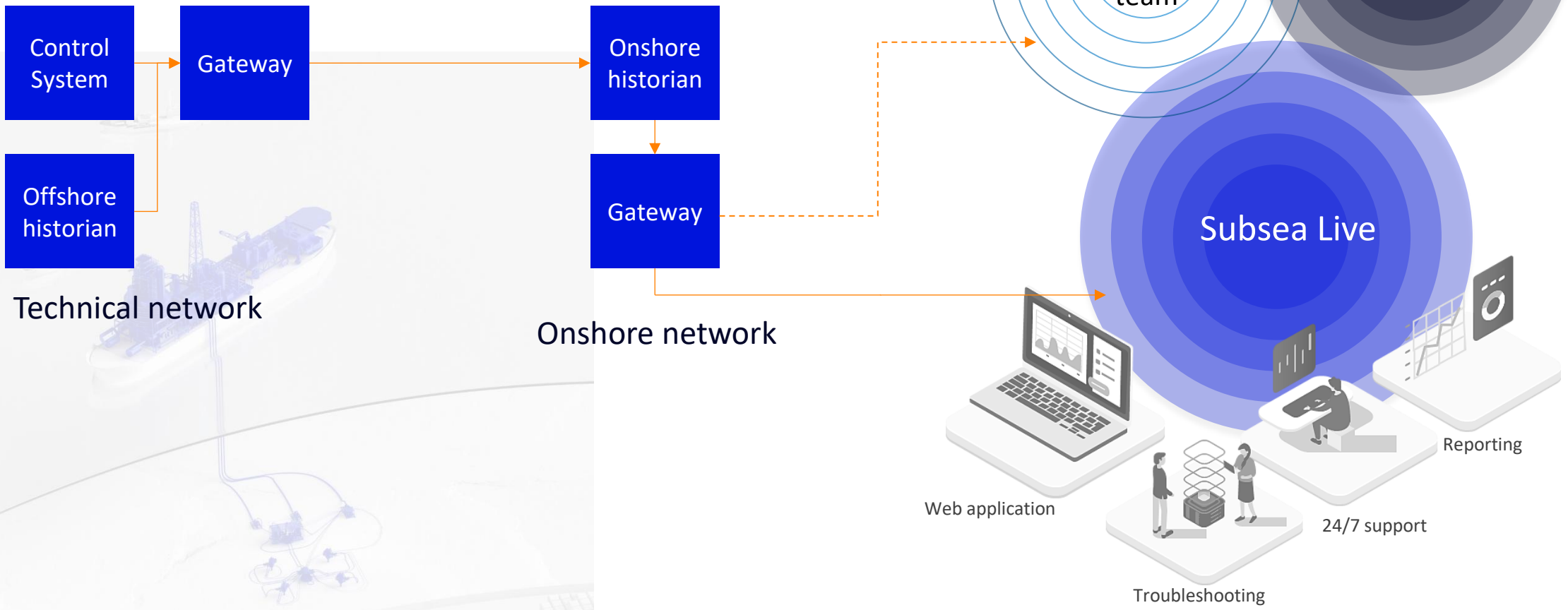
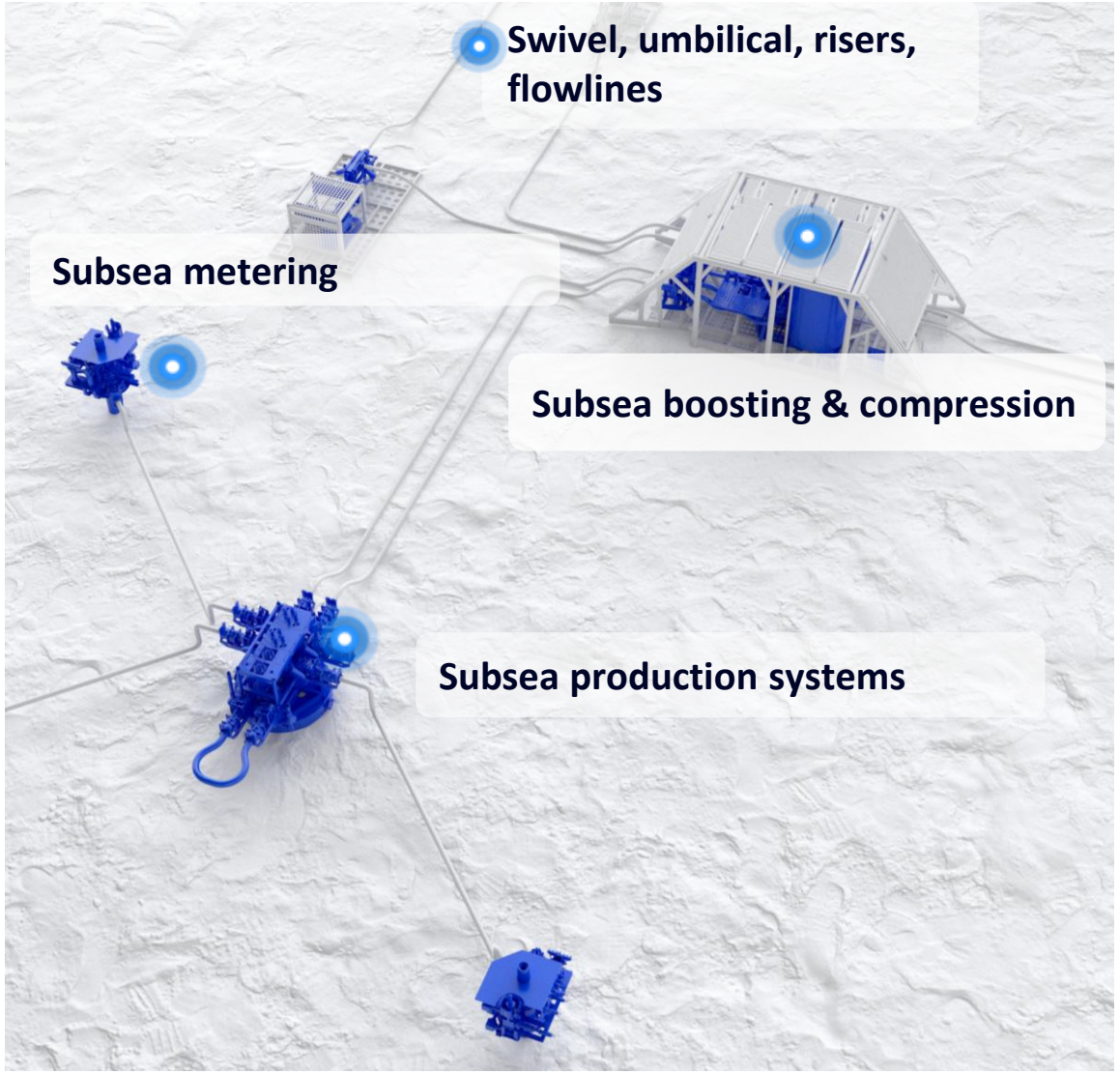
Topology : Easy Data Access



Subsea Live: Capabilities

Optimizing asset performance with real-time actionable insights.

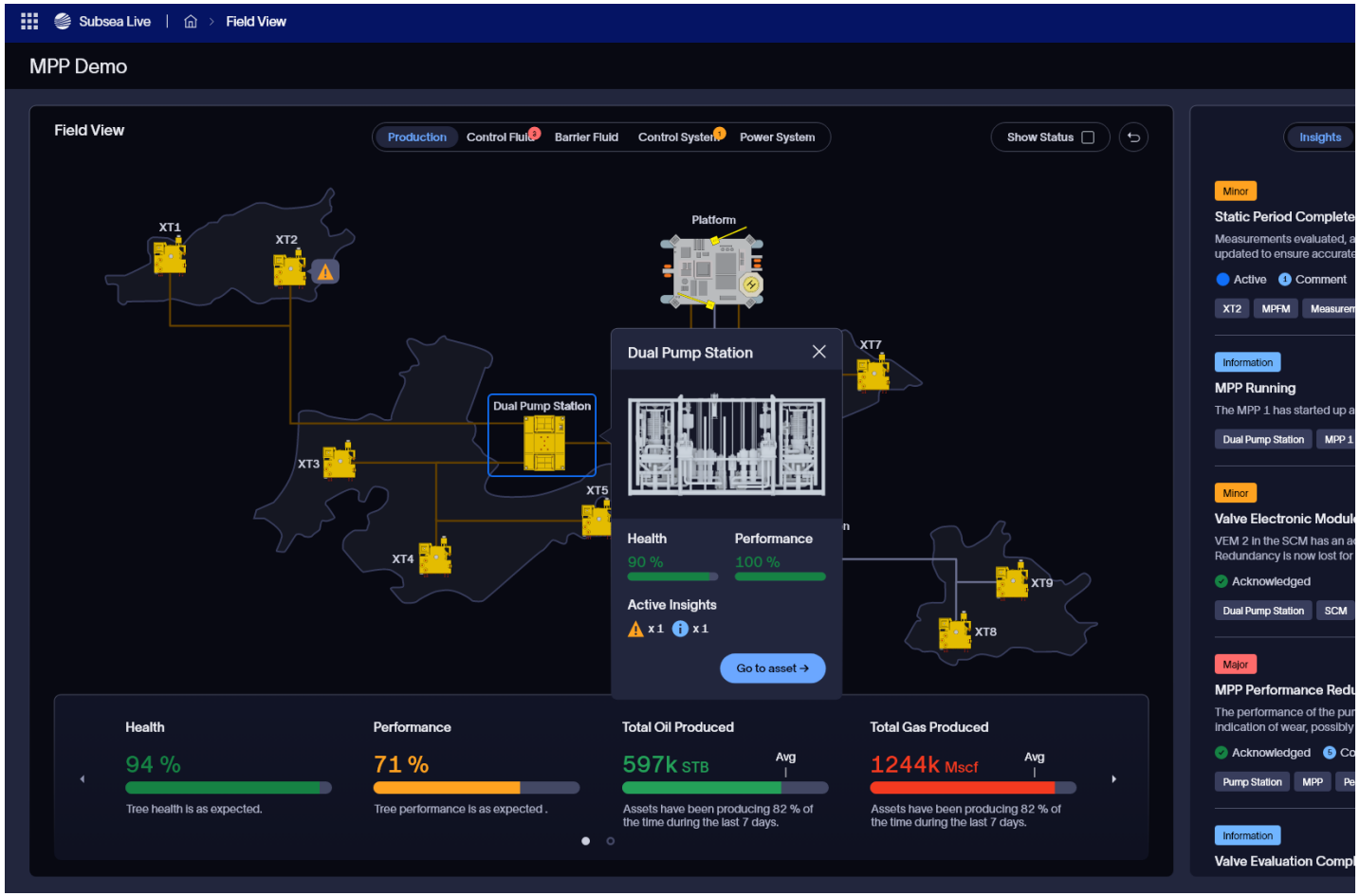
- Health insights
- Performance insights
- Operational insights




Subsea Live
Data-driven performance service

Subsea Boosting and Compression

- Determine and predict the health and integrity of the boosting system
- Identify flow assurance or wear induced performance reduction
- Manage risks and maximize uptime
- Performance advisors
- Support and improve maintenance planning



Optimize the performance of your subsea boosting and compression system through subsea digitalization.

Pump and compressor

Detect degradation and classify anomalies in real-time to optimize performance.

- Determine and predict hardware health
- Enhance uptime
- Extend operational boundaries

Barrier fluid system

Secure clean fluids for electrical motor and mechanical seal lubrication.

- Consumption
- Leak detection
- Reduced cooling efficiency
- Component performance evaluation

Control fluid system

Ensure control fluid system ability to provide clean pressurized hydraulic fluids

- Component performance evaluation
- Leak detection and liquid inventory
- Theoretical vs. actual consumption

Power drive system

Remote analysis of electrical signals and power to diagnose subsea equipment.

- Signal processing
- Motor current analysis
- Fault diagnose
- Electric drive state and optimization

Control system

Monitor topside and subsea sensors, safeguarding for the subsea production system

- Control system integrity
- Identification of communication failures and issues
- Currents, voltages and temperatures

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Subsea Production Systems

- Evaluate subsea production system integrity
- Aggregate insights across the system for advisory and optimization
- Track operations and usage for reliability monitoring
- Support operation and maintenance planning
- Ensure control fluid system ability to provide clean pressurized hydraulic fluids
- Monitor topside and subsea sensors, safeguarding for the subsea production system

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Enhance the asset performance of your subsea production systems through subsea digitalization

Subsea equipment

Detection and classification of equipment performance

- Valve and choke performance
- Identification of transmitter malfunction or drift
- CIMV health and accuracy
- Downhole instrument verification
- SCM monitoring and diagnostics

Control fluid system

Ensure control fluid system ability to provide clean pressurized hydraulic fluids

- Component performance evaluation
- Leak detection and liquid inventory
- Theoretical vs. actual consumption

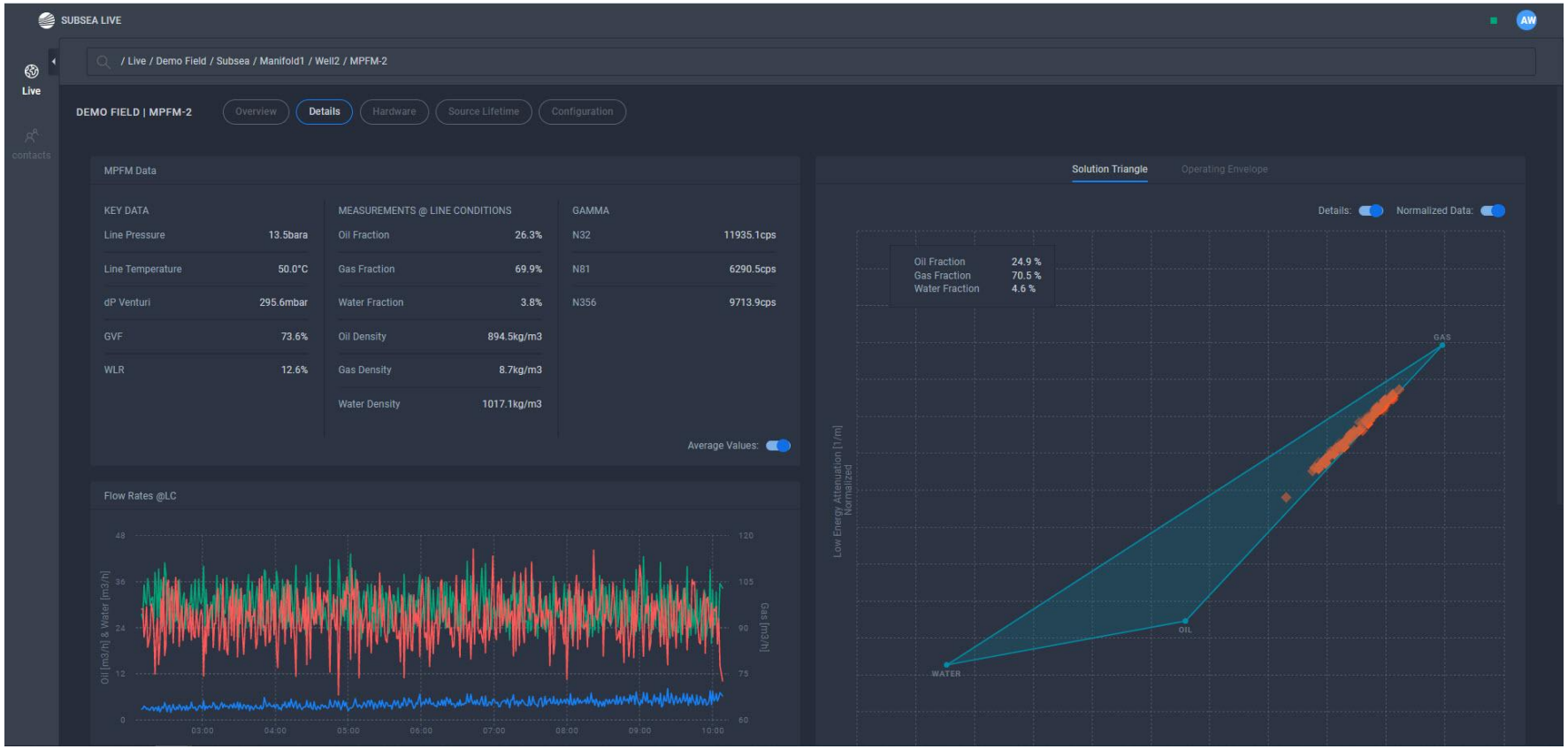
Signals and control system

Monitor topside and subsea sensors, safeguarding for the subsea production system

- Identification of system issue
- Line insulation deterioration
- Control system integrity
- Identification of communication failures and issues
- Currents, voltages and temperatures

Subsea Metering

- Assess and validate the measurement performance
- Detect anomalies through flow/static period analysis
- Recognize changes in fluid properties
- Identify flow assurance related concerns
- Demonstrate hardware integrity
- Detect and quantify sand
- Estimate remaining lifetime of gamma source



Maximize the value of your subsea meter through subsea digitalization

Maintaining measurement quality

Detect measurement anomalies, and recognize root cause

- Changes in water salinity, oil and gas properties
- Identify drift in measurements and operational conditions
- Validate and quantify solid deposits; wax, hydrates, scale, asphaltenes, H2S, sulphur, CO2

Detection of sand production in the well stream

Estimate the amount of sand that passes through the subsea meter

- Quantify sand mass produced during high-concentration sand events
- Provide corrected flow rates during sand events
- Enable correlation with existing sand detectors

Estimate remaining useful life of the gamma source

Determine how long into the future there will be sufficient gamma counts to achieve acceptable flow readings

- Evaluate impact of changes and increase in water liquid ratio
- Monitor source decay
- Plan production changes through scenario simulations

Case Study: Run or Replace

Stones project Gulf of America

2900m water depth

Subsea pump application

Challenge

- Operation of the single-phase pump under gas conditions to enhance production
- Minimize nonproductive time due to operational wear
- Quick implementation of mitigations and troubleshooting strategies with minimum production impact

Solution

- Subsea Live service deployed, providing real-time data analytics
- Rapidly implemented, intelligent pump operation interpretation solutions
- Streamlined the collaboration between OneSubsea and Shell tackling the challenges as one team

Results

- Production increase achieved by enabling existing equipment beyond original design
- Prolonged pump replacement time allowing planned subsea intervention saving thousands of barrels per day of deferment

10%

Production increase

1 year

Prolonged replacement time

Subsea Live - Subsea Asset Performance Management

Maximized uptime

Identify and anticipate issues early to mitigate performance degradation

Production Assurance

Assess and validate the performance and flow assurance challenges

Optimized operations

Extend equipment lifetime, assure flow, reduce costs, and improve maintenance planning

Equipment Health Assessment

Proactive identification of equipment integrity and health

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Thank you

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