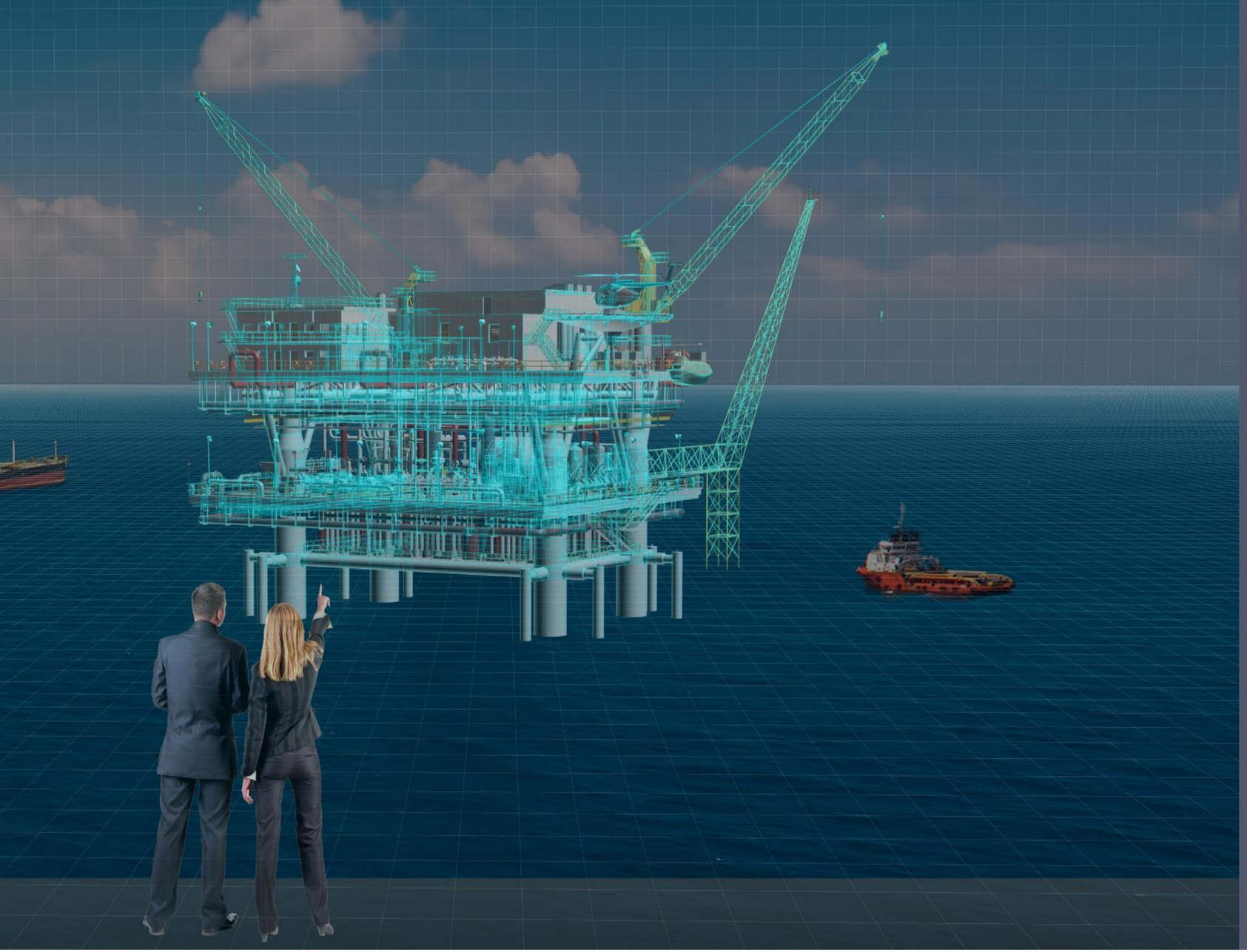


Digital Twin for unmanned facilities

Aberdeen
12-13 June 2018

KONGSBERG

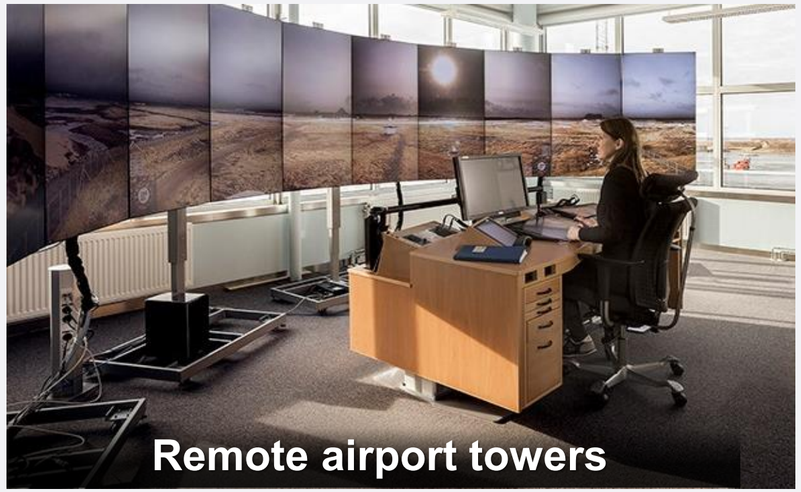
KONGSBERG group – Technology innovation

kognif ai

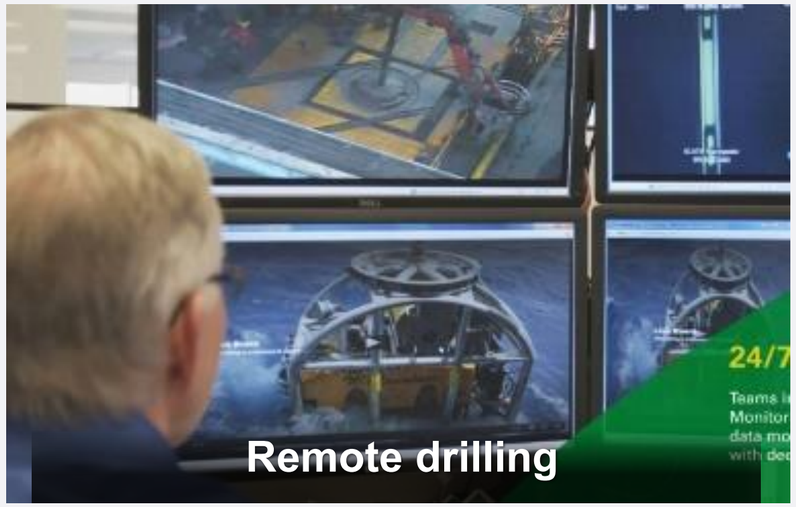
Statoil & KONGSBERG Restricted - Digital Twin for Unmanned Facilities - Feasibility Study

Disruptive digitalization projects

Autonomous ships

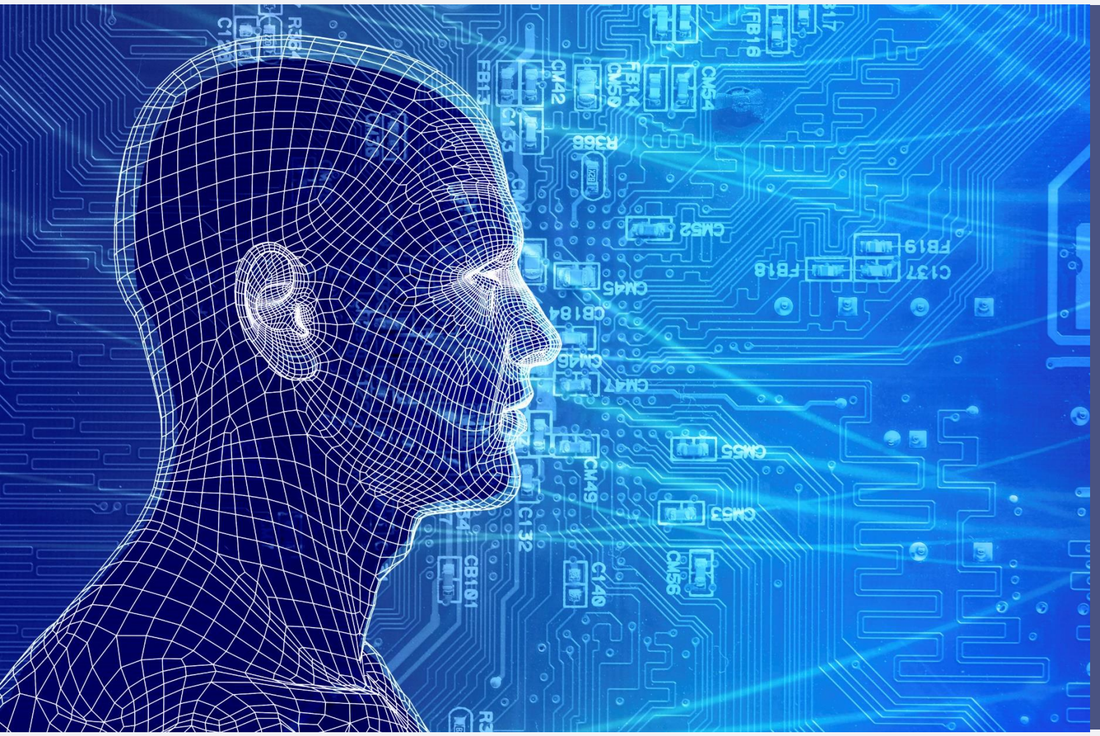

Remote airport towers

Automated wind farms



Remote drilling

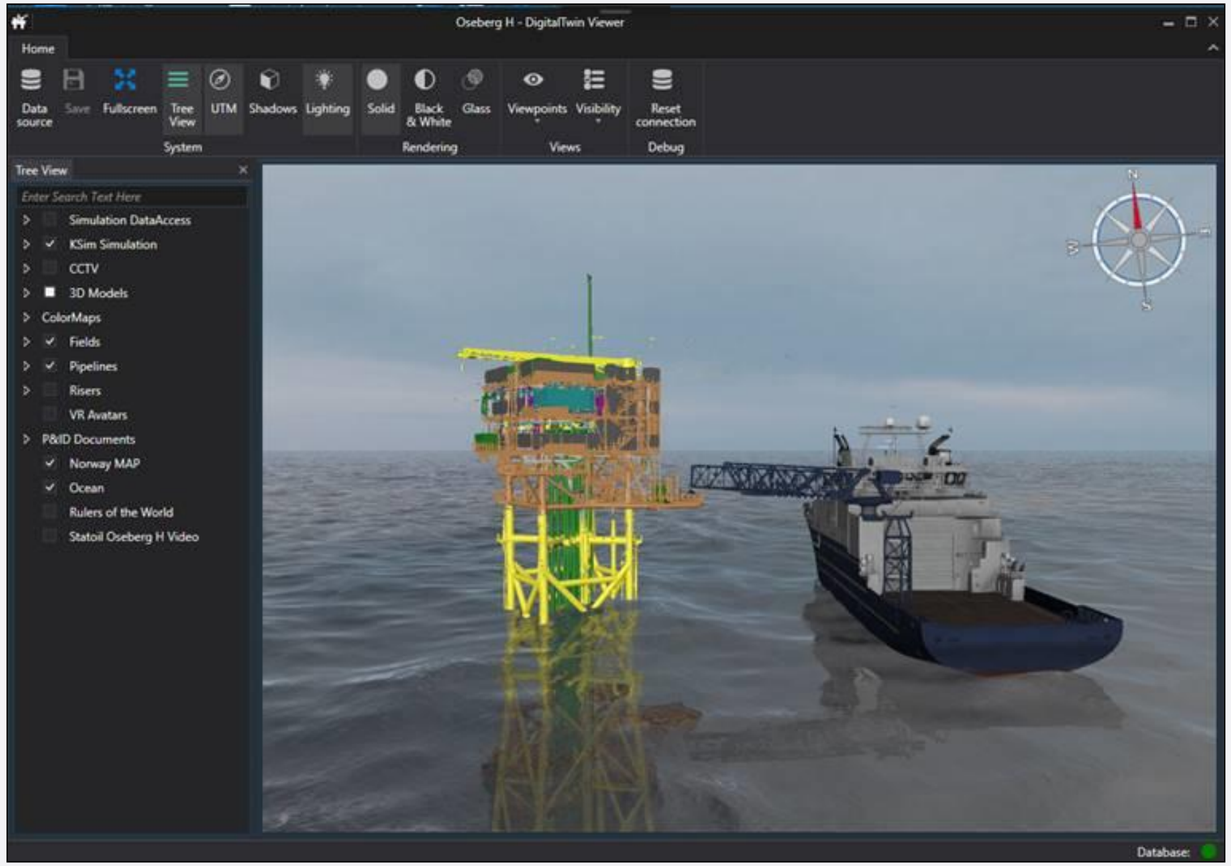
What is a Digital Twin?



- Comprehensive replica & accurate representation
- Advanced analytics and machine learning
- Static, historical and real-time data

- Technical to business operations usage
- Context dependent user interface

KONGSBERG



The installation

The Digital Twin

Digital Twin Screenshots

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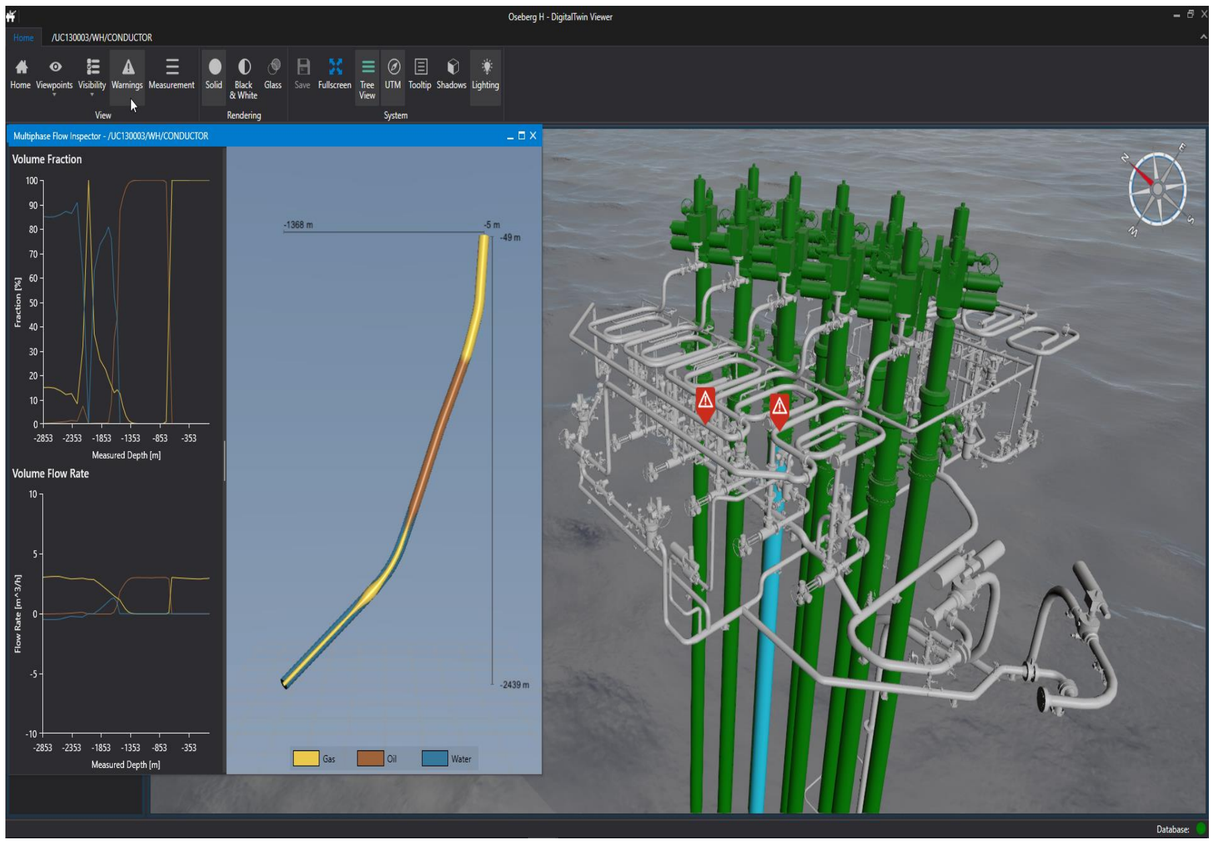

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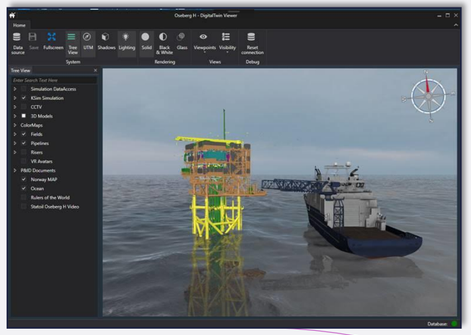


Integrated Field Development Team

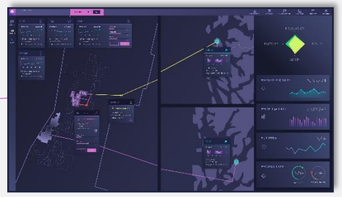
Control Room, Operation Center

Integrated Operation Center

Plan & Expert Centers

Maintenance Team

Vendors Others



Application Areas

Field Development & Modifications

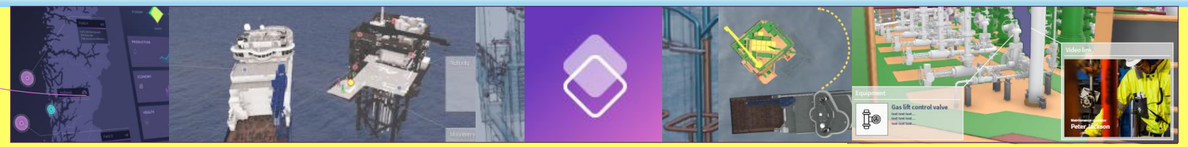
Drilling & Wells

Production Optimization

Operations & Maintenance

Maritime Ops & Logistics

Visualization & Collaboration



Digital Infrastructure & Simulators

Models & Services

Application Programming Interfaces (API)

App Framework	Visualization Engine	Data Services	GIS AIS	Analytics & ML Engines	Simulation Engines
Real Time Data	Historian	Business Data	Asset Models	3D Models	Physical / Mathematical Models
					Data Driven (AI) Models
					Hybrid Models

Digital Platform

Cyber Security

Lifecycle Management

Client Data Platform

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Physical Asset

Facility

Edge Gateway

IMS

SAS | Autonomy

Equipment Packages

Roaming Assets

Vessel

Helicopter

Drone

Topside

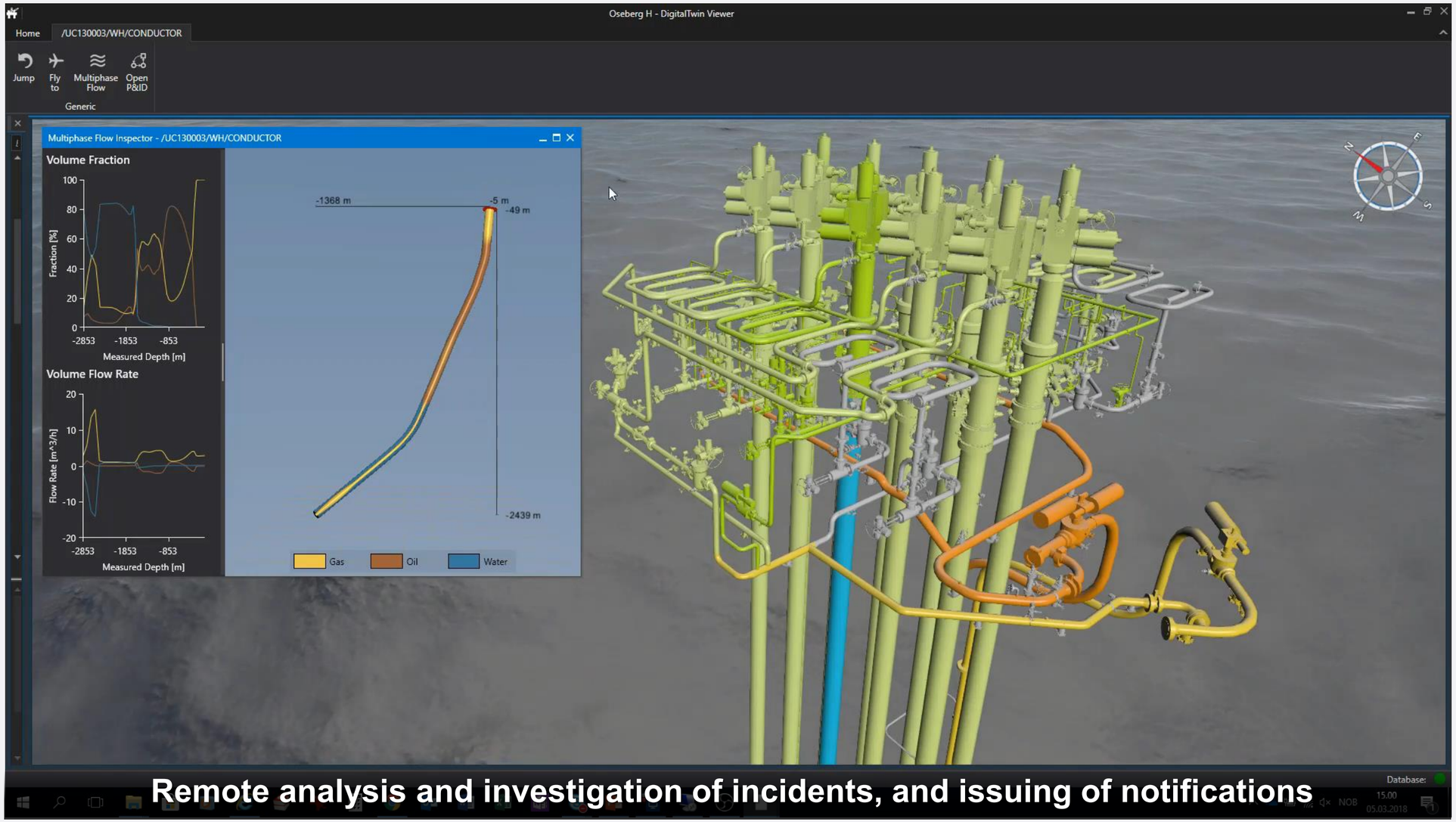
Subsurface

Well & Reservoir

New Operational concept

NORWEGIAN SEA
Krafla
SYSTEM WARNINGS
TASKS
STATUS
ACTIVITY
REQUESTED TASKS
Task description
INCREASE PRODUCTION
Inspector
Simulations
SIMULATED PROCEDURE
PERFORMANCE RESULTS
PRODUCTION RATE
TASK HISTORY LOG
Feed Tank

Monitor performance and solve problems



Remote analysis and investigation of incidents, and issuing of notifications

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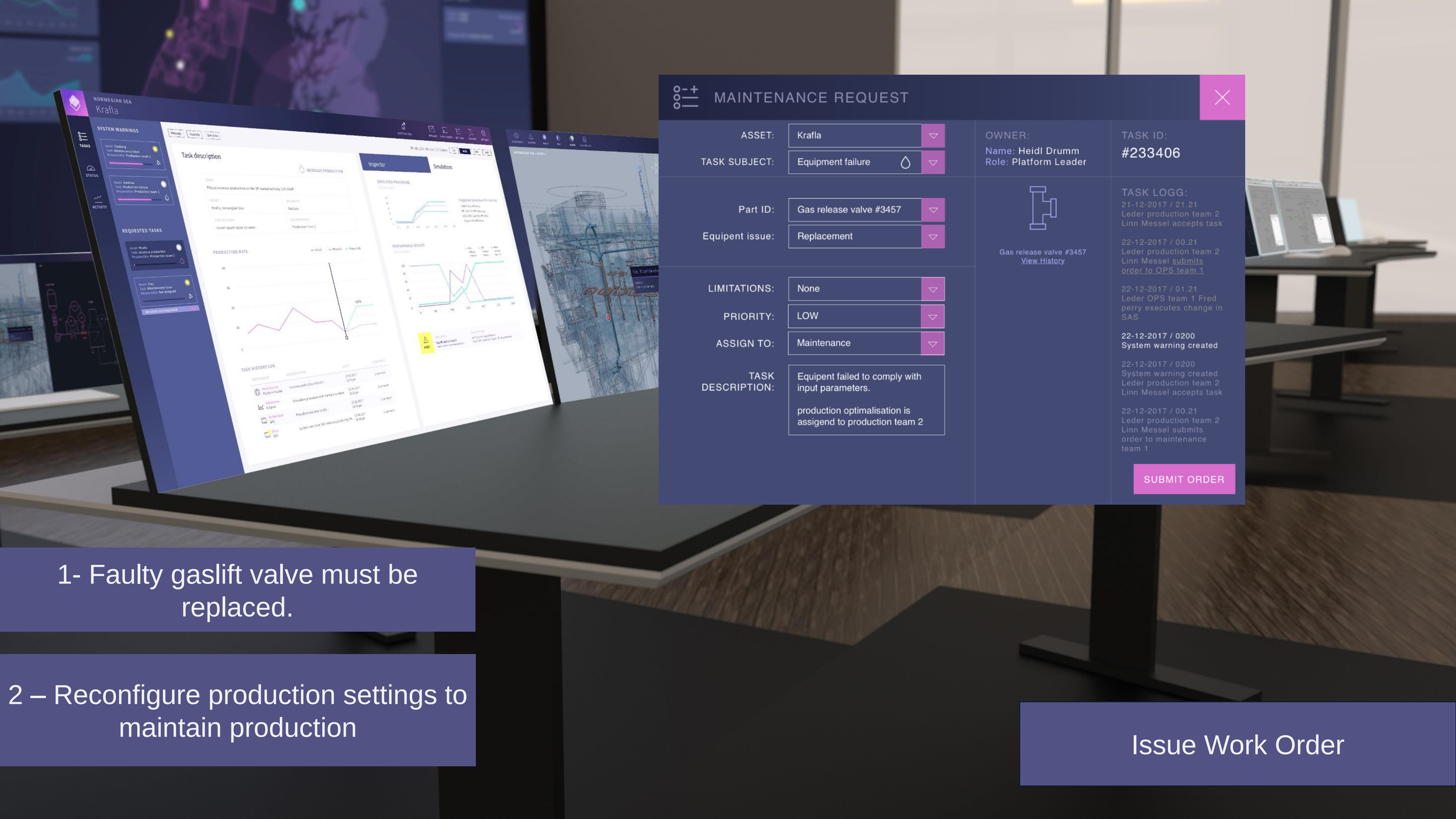
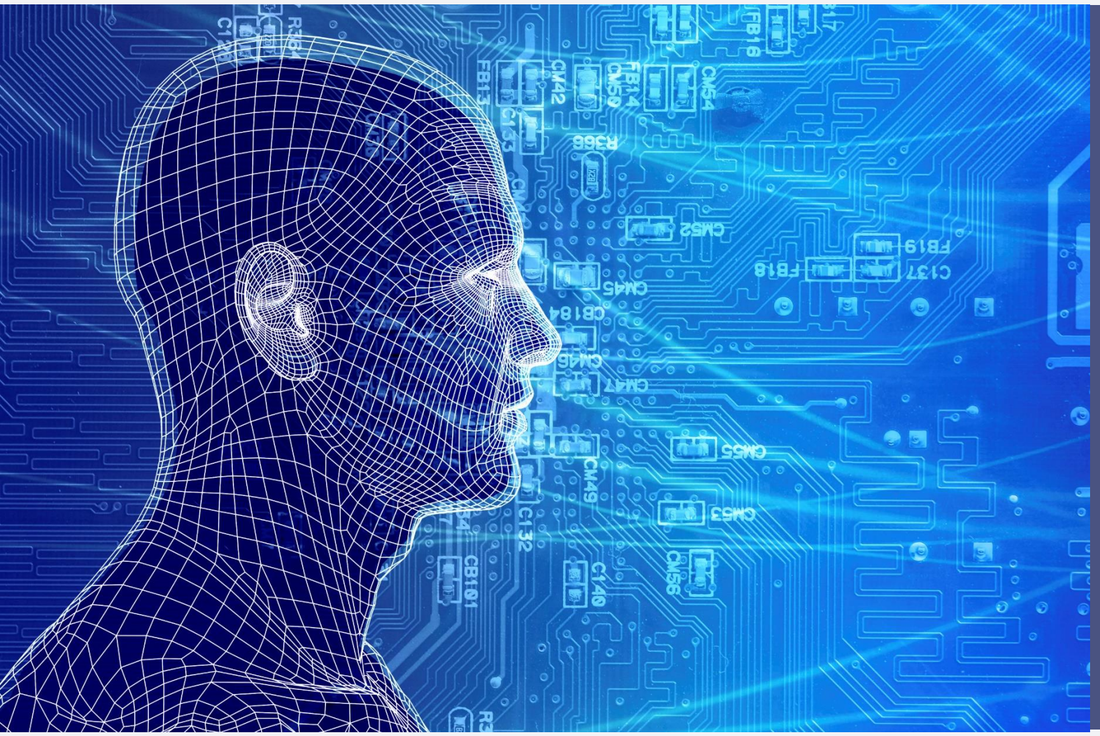

MAINTENANCE REQUEST
ASSET:
Krafla
TASK SUBJECT:
Equipment failure
Part ID:
Gas release valve #3457
Equipent issue:
Replacement
LIMITATIONS:
None
PRIORITY:
LOW
ASSIGN TO:
Maintenance
TASK DESCRIPTION:
Equipent failed to comply with input parameters.
production optimalisation is assigend to production team 2
OWNER:
Name: Heidl Drumm
Role: Platform Leader
Gas release valve #3457
View History
TASK ID:
#233406
TASK LOGG:
21-12-2017 / 21.21
Leder production team 2
Linn Messel accepts task
22-12-2017 / 00.21
Leder production team 2
Linn Messel submits order to OPS team 1
22-12-2017 / 01.21
Leder OPS team 1 Fred perry executes change in SAS
22-12-2017 / 0200
System warning created
22-12-2017 / 0200
System warning created
Leder production team 2
Linn Messel accepts task
22-12-2017 / 00.21
Leder production team 2
Linn Messel submits order to maintenance team 1
SUBMIT ORDER
1- Faulty gaslift valve must be replaced.
2 – Reconfigure production settings to maintain production
Issue Work Order

PREPARING THE TEAM

Maritime Operation

What is a Digital Twin?



- Comprehensive & Accurate
- Advanced Analytics and Machine Learning
- Static, historical and real-time data

- Technical to business operations usage
- Context dependent user interface
- Significant CAPEX/OPEX savings