ELDOR

LIFETIME EXTENSION

07.12.15

deeper into details

Who we are

Responsible for what we deliver.
Professional in what we do.
Considerate in the way we interact.
Proud of our work.

- Established 2006
- Office in Norway/Sandnes
- 40 engineers (majority MSc level)
- ISO 9001 certified in 2013
- Specialists with operational expertise
- Lifetime Extensions of systems and facilities
- System integration and engineering
- epc(ic) delivery, Instrument Aut Telecom

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Development

Consulting Services

SAS (ICSS), Telecom,
Industrial IT and
Change management

Project deliveries

Single discipline EPCI,
Alarm Mgt,
SAS, Telecom, Industrial IT
upgrades.
Onshore Operation Centre,.
Control rooms and Improved
Operation.
ISO 9001 certified.

Operational support

Alarm system with
performance guarantee.
SPI (Smart Plant
Instrumentation)
maintenance

Eldor Technology

Innovative and smart
products for the
oil & gas market.
AlarmTracker
Tips-LogMate
Epsis-Teambox

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ELDOR
TECHNOLOGY
07.12.15

Content

Alarm TRACKER

- Vision Eldor Technology AS
- Background
- Today´s solution
- User requirements
- Our Approach
- Functional Modelling
- Business Value
- User Interface example
- Team

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Vision

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With the use of

innovative technology

and domain knowledge
we shall strenghten safety,
improve regularity and

increase production

in the oil and gas industry

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Potential loss

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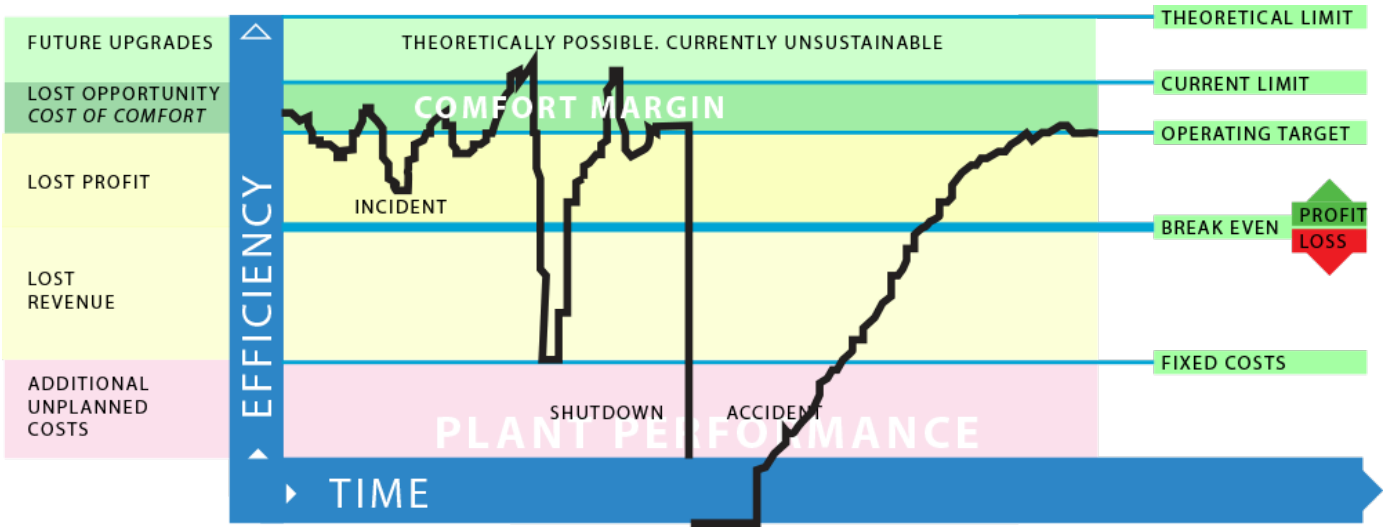
Industrial plants lose 3-8 % production due to unplanned upsets



Source: Abnormal Situation Management Consortium with members from e.g. Chevron, BP, Total, ConocoPhillips, ExxonMobil, Shell, Sasol and Honeywell

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Lack of awareness

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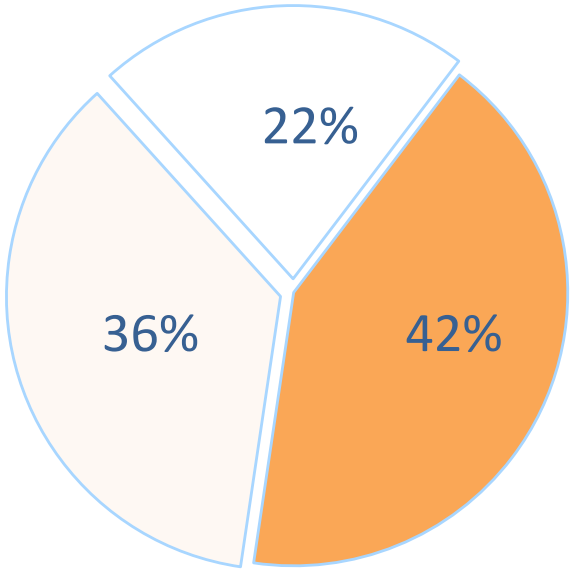
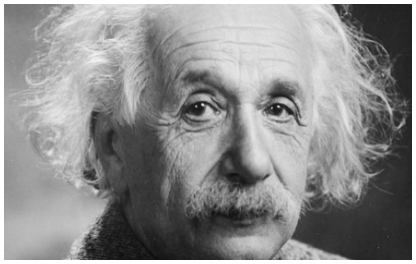
50% of unplanned upsets are due to lack of situational awareness

Sources of Abnormal Events



- Process
- People
- Equipment

- 90% preventable
- Actions or inactions
- Decision making



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Situational Management

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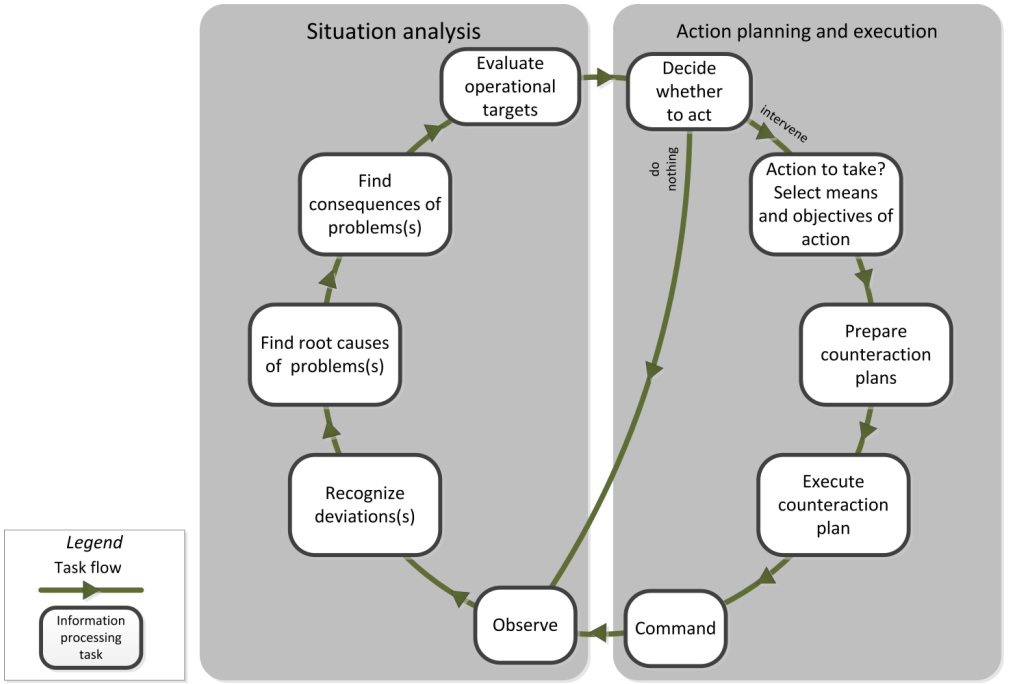
- A rational process of management of situations in complex systems involves two phases: Analysis and Action.
- Humans tend to violate these principles by making shortcuts based on experience and knowledge.
- Lack of informed decisions can lead to suboptimal production, abnormal situations, shutdowns or disasters
- Decision Support Systems that guide the operator thru the process are recommended



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Operator challenges

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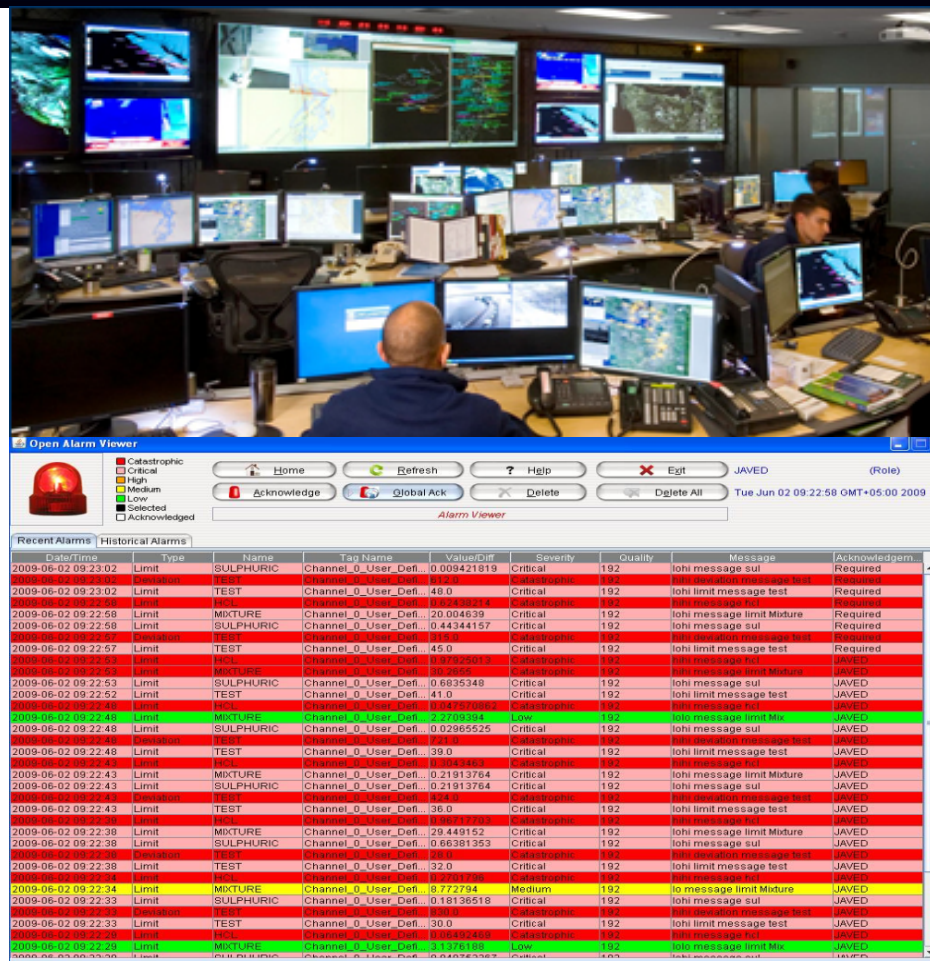
- Number of systems
- Integration of systems
- Information channels
- Information/ Data Points
- Operators/ Control loops



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Our approach

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3 Counter Action Planning

Counter Actions to resume to normal process status proposed to the operator dynamically

2 Consequence Propagation

Generation and visualization of possible future development of the abnormal situation

1 Highlight Root Cause

Immediate visualization of the root cause behind the abnormal situation

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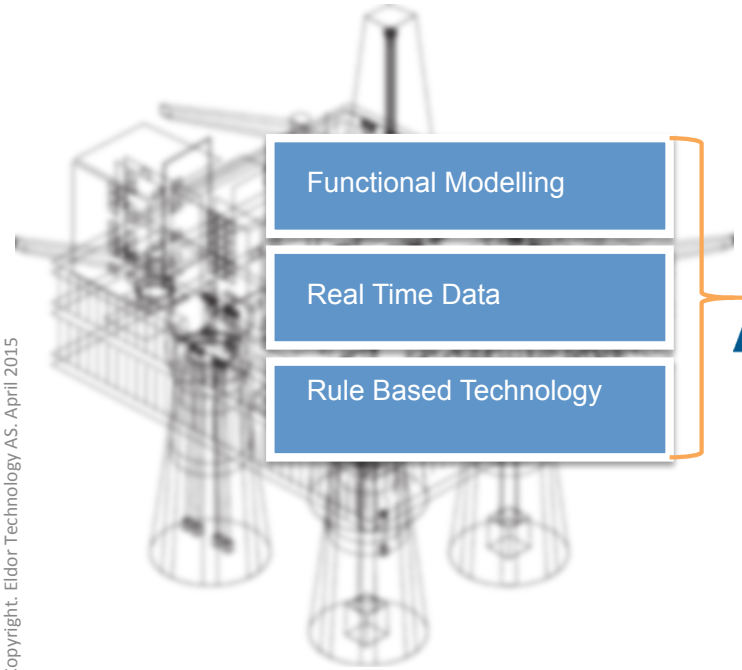
AlarmTracker



- Functional Modelling
- Real Time Data
- Rule Based Technology

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COUNTER ACTION

Counter Actions for return to normal situation provided to the operator

CONSEQUENSE

Future consequences of the abnormal situation provided to the operator in real time

CAUSE

Root Cause highlighted directly to the operator in real time

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Functional Modelling

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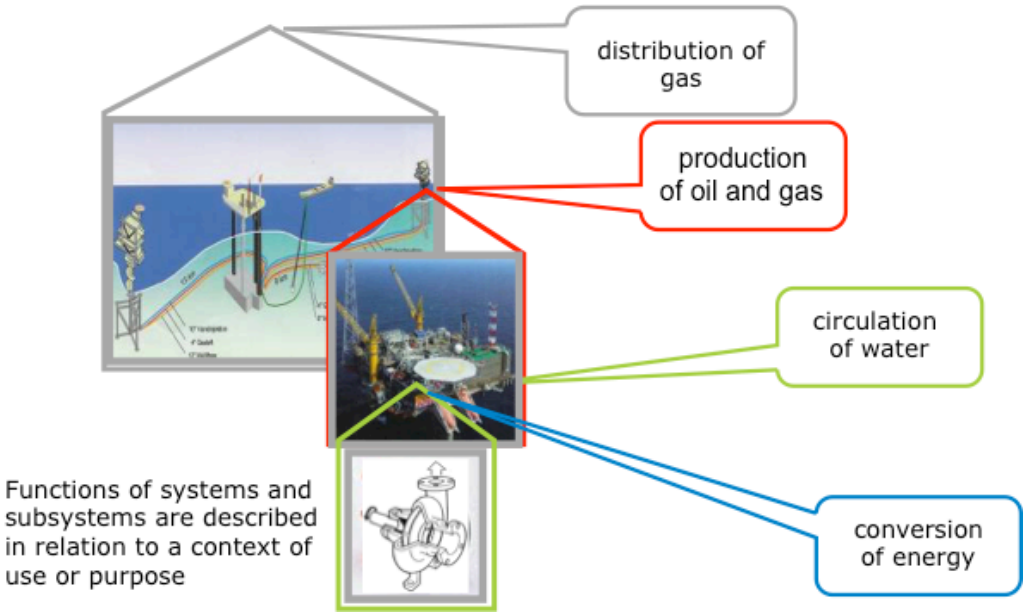
- A structured representation of a engineered system decomposed to functions.
- Functions represented in relation to context and with their interrelations mapped.
- Goals, objectives, means, ends and control functions related to functions of systems forms the basis for the modelling.
- Designed for fault management of complex systems
- Applies to system design and operation



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Real Time Data

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- Connected to real time data coming from the integrated control and safety systems.
- Vendor neutral connectivity by OPC UA (preferred), OPC DA /AE or by Modbus TCP.
- Digital, analogue and alarm & event data subscription for use in MFM model.
- Real Time data mapped to give feedback to control functions used in the MFM model as evidence.
- Static data (e.g. description, alarm limits , alarm information) used in user interface to generate intelligent messages.

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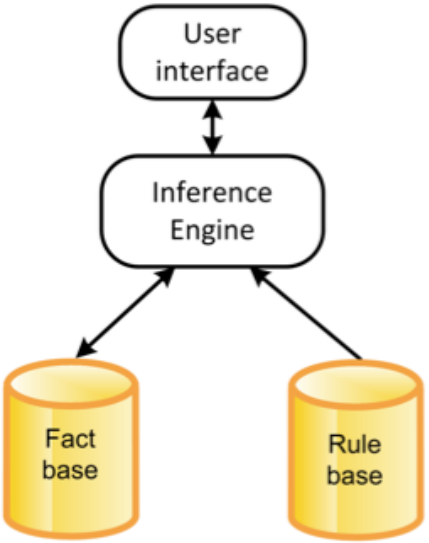
Rule Based Technology

- Product of Artificial Intelligence research (1980-1990) matured into commercial software (offered by e.g. Microsoft, IBM, Red Hat) for business modelling and decision support
- Used for problem solving with complex decision logic with many conditions and/ or many rules and supports high level programming
- Simple basic architecture including an inference engine and knowledge bases representing facts and rules.
- Inference engine based on the highly efficient “Rete” algorithm for pattern matching
- Facilitate representation of problem domains with interacting tasks and complex multilevel decision logic



Basic architecture of a rule based system

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AlarmTracker Business value

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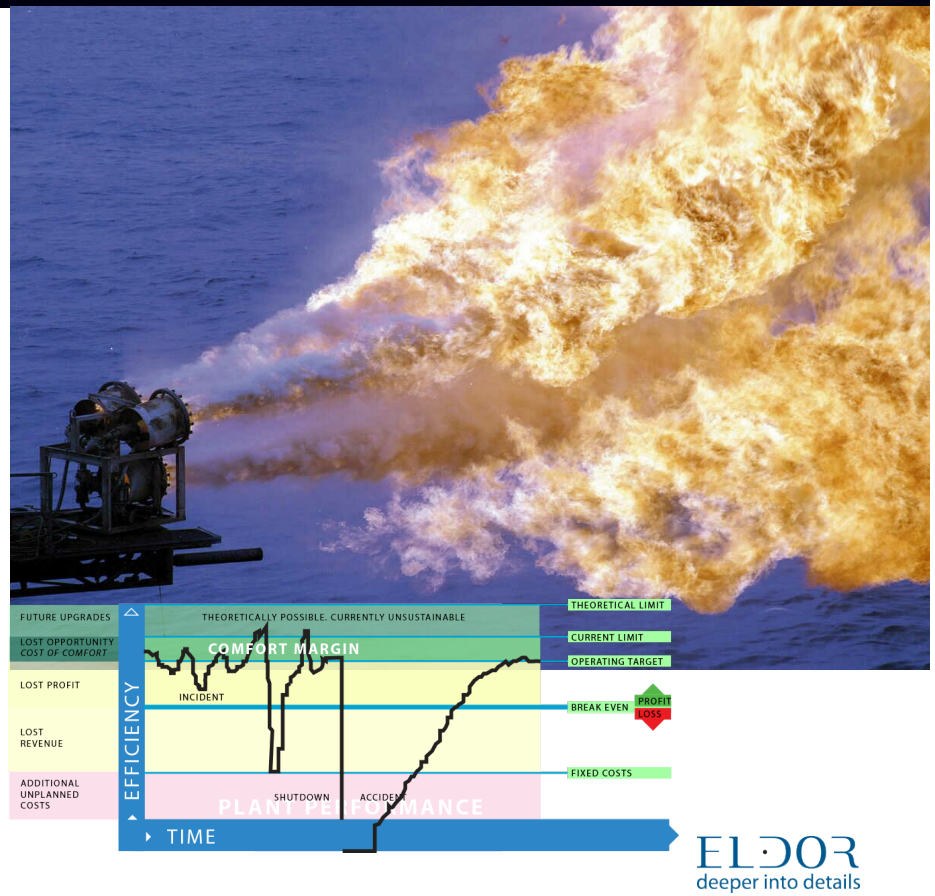
Increase production output by 5%, reduce flaring and increase safety

- **Understand all situations**
  with reduced time to action (Situational awareness)
- **Deal with the cause(s)**
  of the abnormal situation. Not the alarms/symptoms (Root Cause)
- **Developing scenarios**
  from the abnormal situation shown directly (Consequences)
- **Actions recommended**
  to get back to the normal situation (Counter Action Planning)
- **Deal with the upsets up front**
  to avoid shutdown and incidents (Decision Support)



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Why Eldor Technology and AlarmTracker

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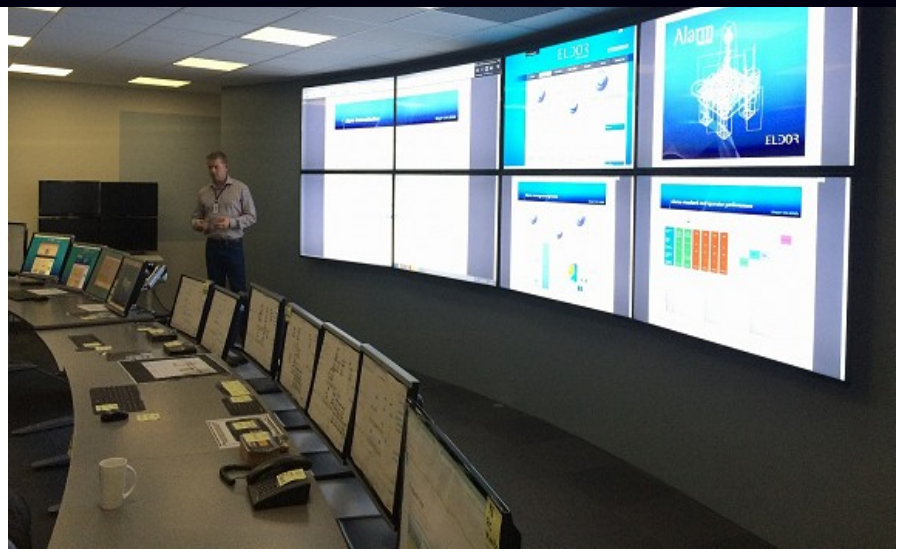
- We have senior personnel
- We have historical integration experience
- We know design and operation
- We rethink and innovate
- We recognize the industry challenges
- We collaborate



ConocoPhillips DETNORSKE TOTAL bp DTU

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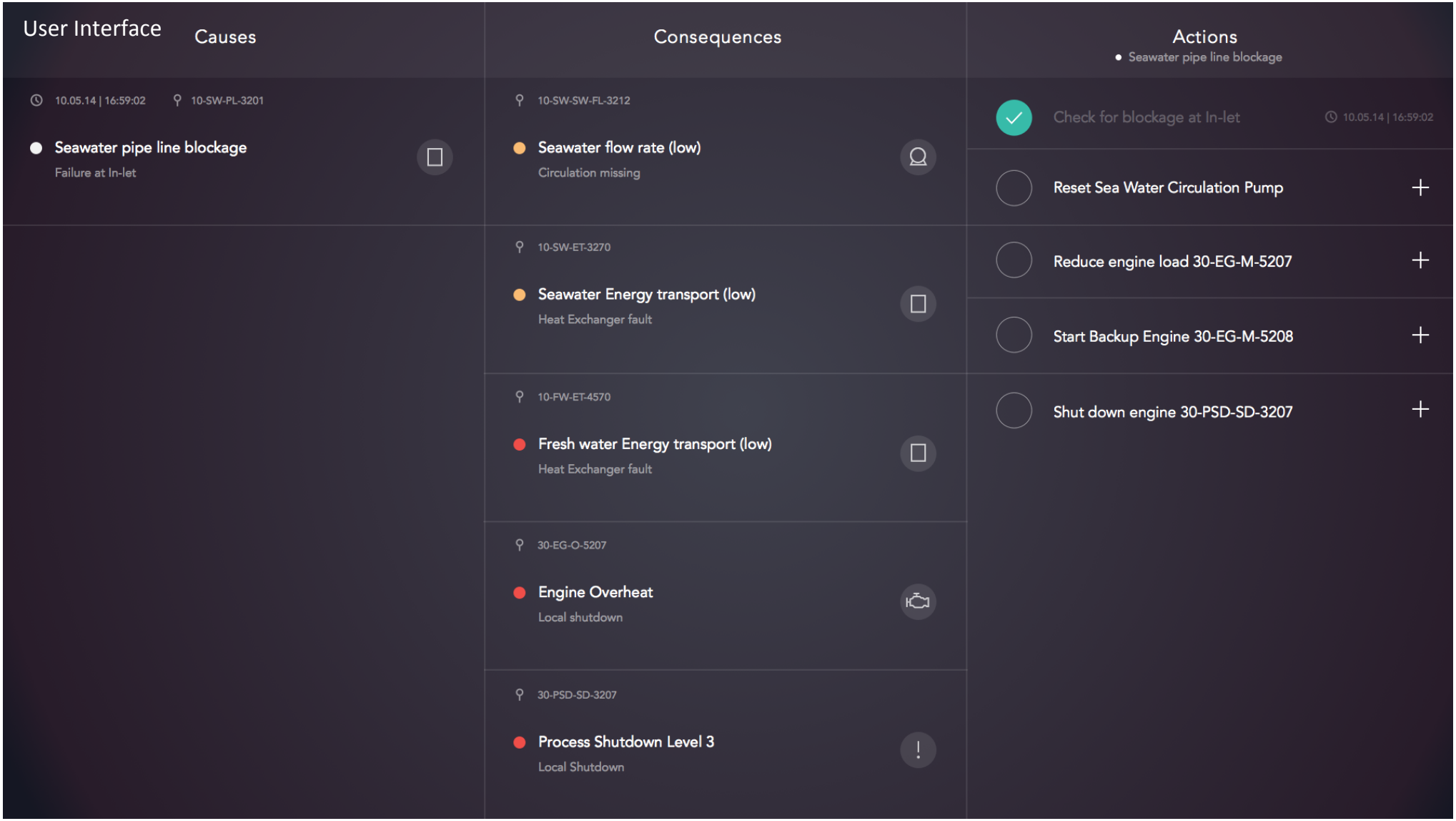
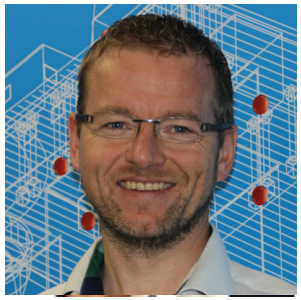

User Interface
Causes
Consequences
Actions
Seawater pipe line blockage
10.05.14 | 16:59:02
10-SW-PL-3201
Seawater pipe line blockage
Failure at In-let
10-SW-SW-FL-3212
Seawater flow rate (low)
Circulation missing
10-SW-ET-3270
Seawater Energy transport (low)
Heat Exchanger fault
10-FW-ET-4570
Fresh water Energy transport (low)
Heat Exchanger fault
30-EG-O-5207
Engine Overheat
Local shutdown
30-PSD-SD-3207
Process Shutdown Level 3
Local Shutdown
Check for blockage at In-let
10.05.14 | 16:59:02
Reset Sea Water Circulation Pump
Reduce engine load 30-EG-M-5207
Start Backup Engine 30-EG-M-5208
Shut down engine 30-PSD-SD-3207

Team

The company's entrepreneurs

Highly experienced within offshore operations, both in Norway and internationally
Experience from Oil & Gas in general, integrated operations, ICT, and entrepreneurship



Bjarne André Asheim
CEO

More>>

Børge Richard Kolstad
Chairman of the Board

More>>

Bernt Hjalmar Eldor
Board member and business developer

More>>

Ove Heitmann Hansen
Board member

More>>

Stian Vemmestad
Counselor

More>>

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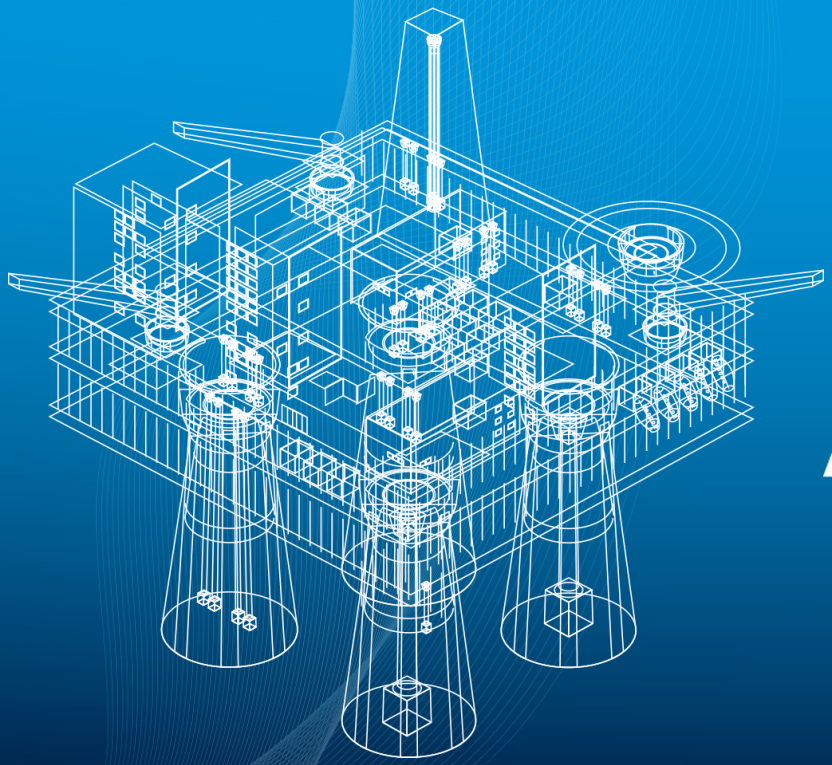

Alarm TRACKER

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