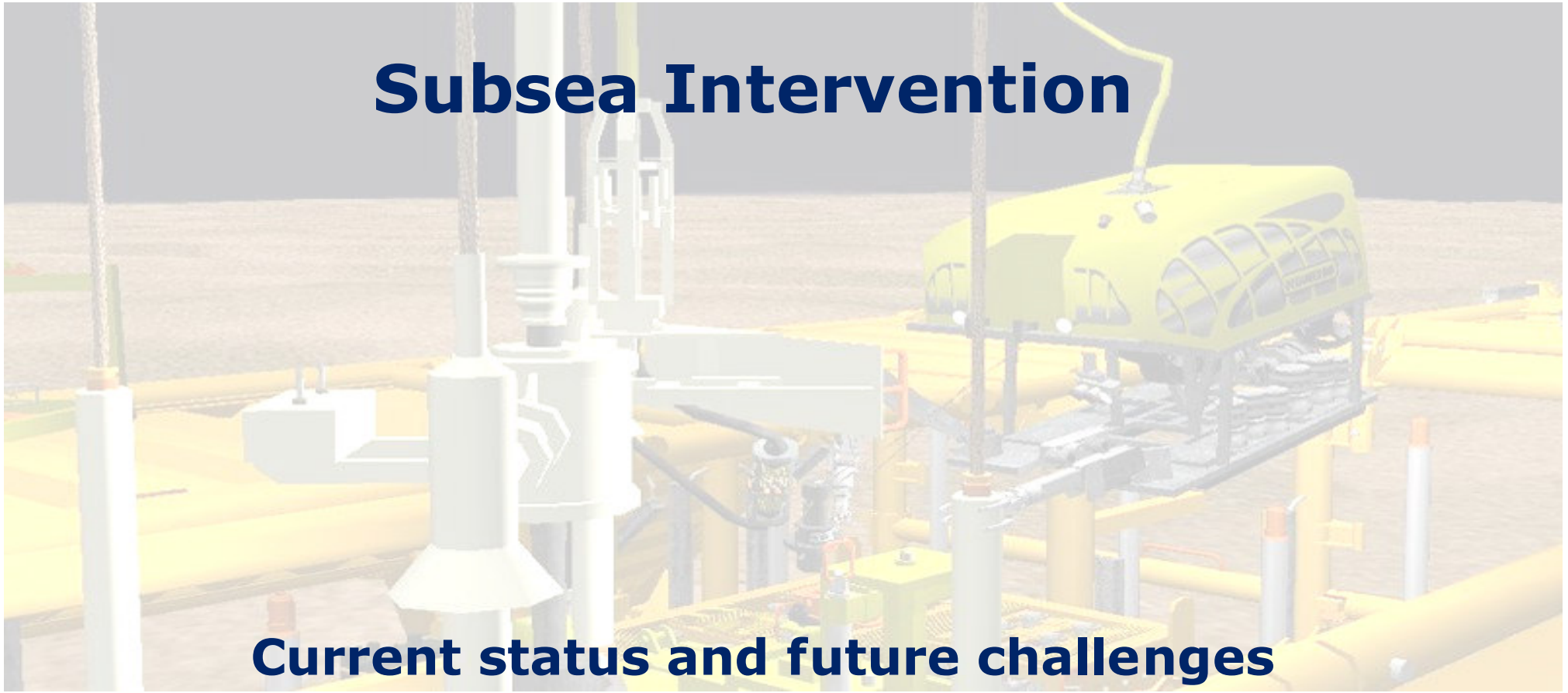


Subsea Intervention

Current status and future challenges

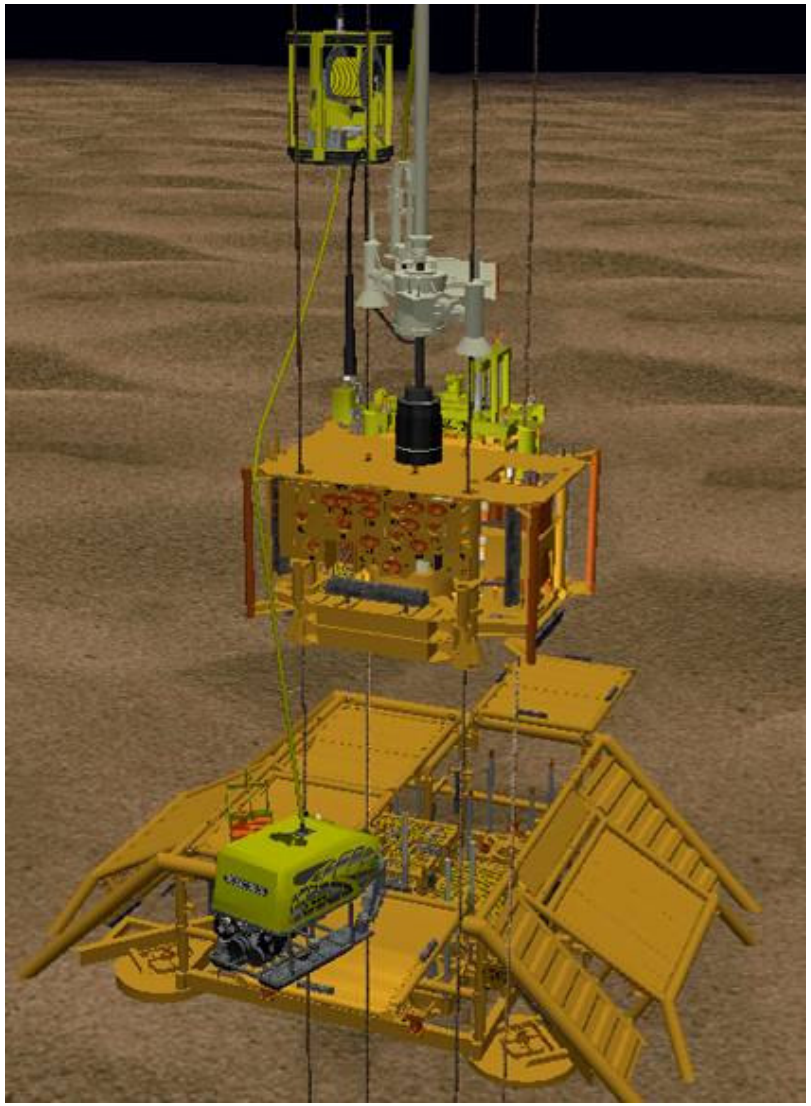
Atle Rettedal, Vice President Subsea technology and operations, Statoil

FFU, February 2nd 2006 - Stavanger

STATOIL

Agenda

- Evolution of Subsea Intervention
- Current status
- Challenges
- Looking into the future



Evolution of Tie-in equipment

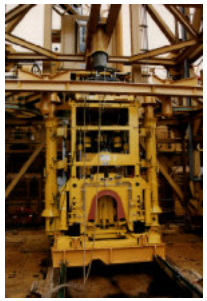
1st generation

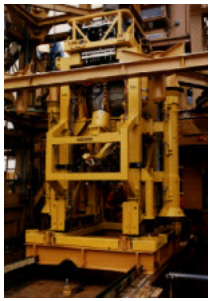
Gullfaks A 1986

Separate pull-in and connection tools

2nd generation

Statfjord Satellites





Separate pull-in and connection tools

3rd generation

HOST System

Combined pull-in and connection tools

4th generation

ROV based tie-in system

ROVCON, ICARUS, BBRTS

Evolution of Module Replacement

1st generation

Gullfaks A 1986

SCM RT /EL. CABLE CONN. TOOL

2nd generation

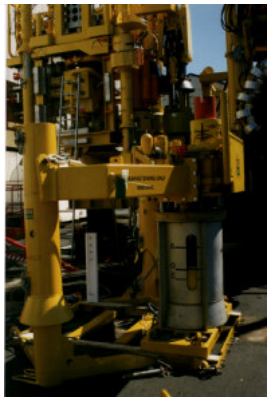
Statfjord Satellites

UNIVERSAL RUNNING TOOL

3rd generation

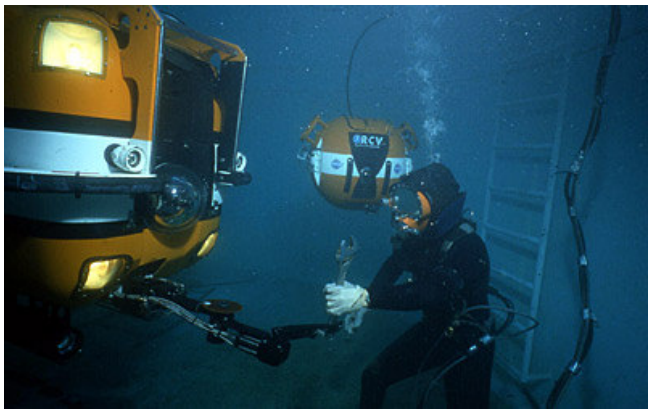
HOST System

HOST SYSTEM, FLOW CONTROL MODULE



MULTIFUNCTION INTERVENTION TOOL, SCM MODE

Evolution of ROV's



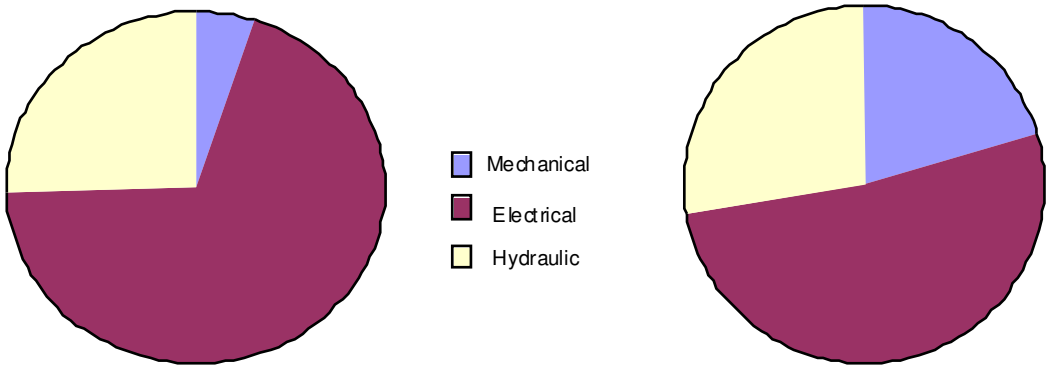
70 s and 80 s

New millennium

The ROV situation in the mid 90 s

- Extensive downtime on ROV's
- Interface conflicts (e.g. ROV access and operability, collision between various subsea components)
- Long learning curve on ROV intervention operations

ROV Downtime – Distribution of Failures



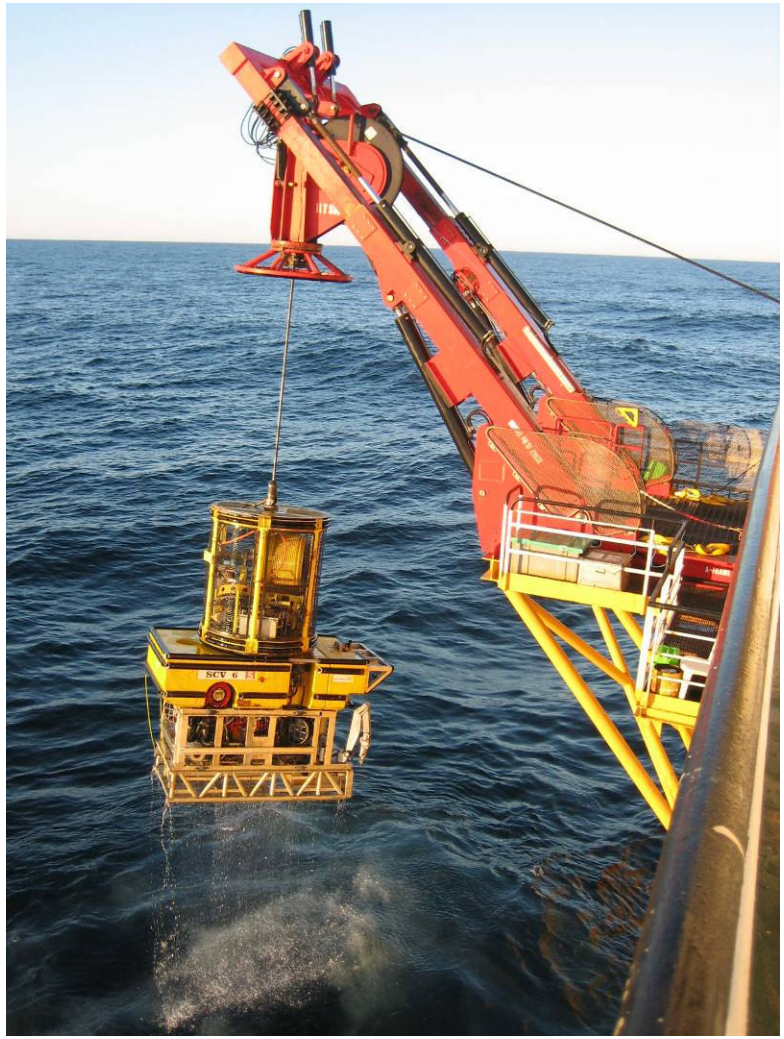
Failure by Type (GOM)

Failure by Type (North Sea)

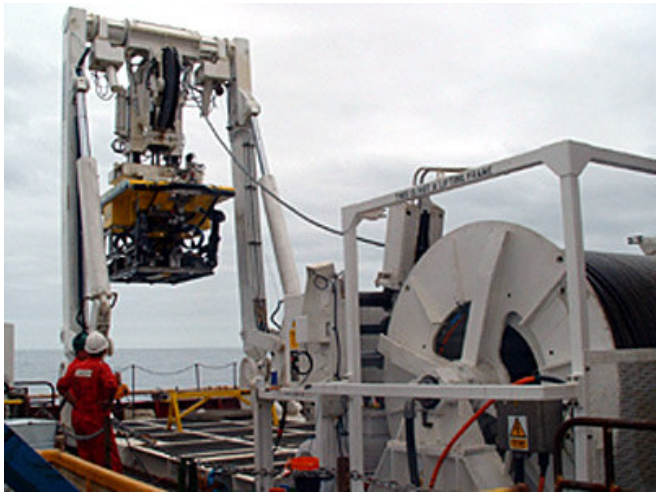
Source: NDP (Norwegian Deepwater Project)

Current Status

- MANY tie-in tools
- Poor standardisation
- Traditional ROV's
  - Large
  - Typical Hs 2.5 - 4.5m for launch & recovery
- Less down time
- Technology program initiated
- Good ROV crew
- Advanced Visualisation & Simulation Tools in use, e.g. MIMIC



HSE and work environment



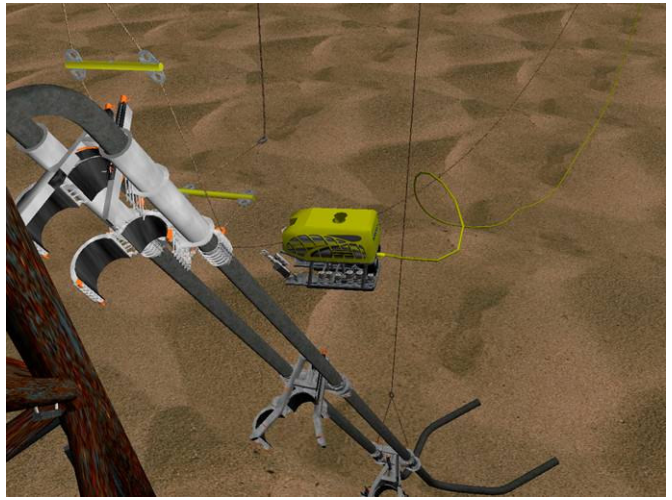
Mostly outdoor activity

Some vessel with ROV hangars

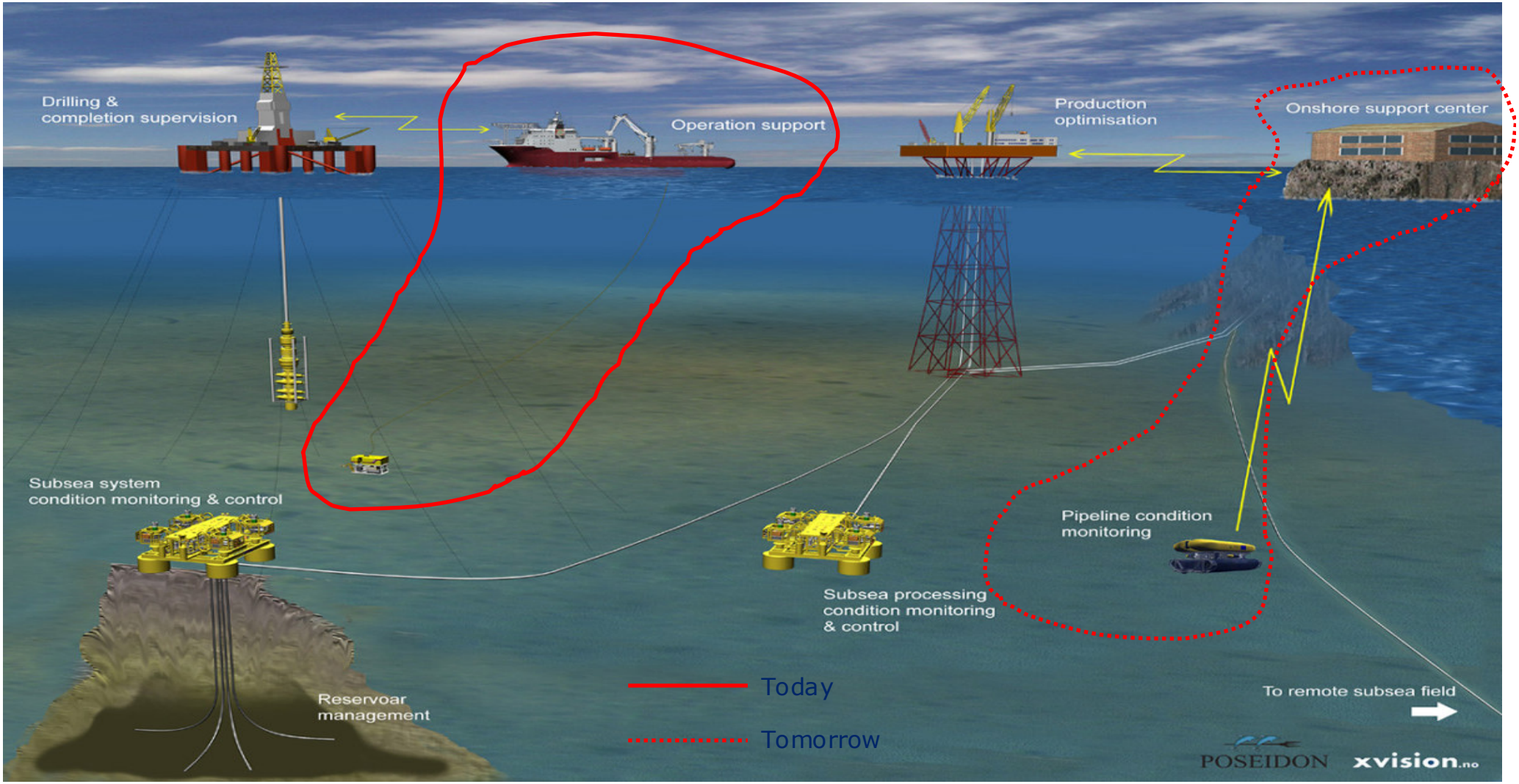
Integrated ROV hangars with launch and recovery through moonpool are coming

New Statoil ROV contracts

- Rig support for fixed installations
- Rig support for floaters
- Contract administration

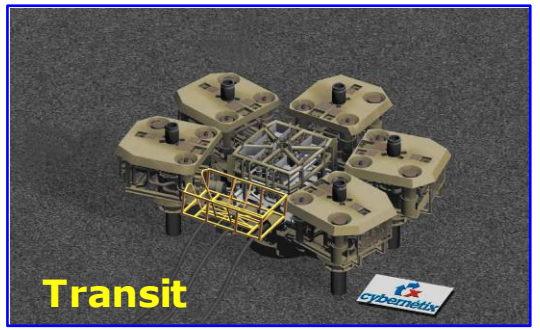


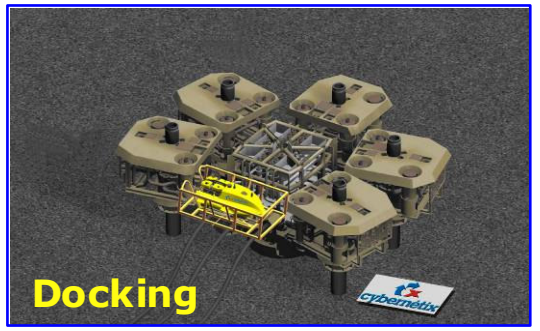
Near future – Integrated Operations



Near future - improvements

- Improved ROV design
- Further improve standardisation
- Environmental friendly solutions
- "Intervention mentality" throughout design
- Modification and refinement of early generation equipment
- Establish ROV education (apprentices?)
- Improve visualisation and simulation tools
- AUV technology





Rock science

A vision for Arctic Operations

Pushing geograpical and technological frontiers

STATOIL