



Workshop: Pushing the Oil Recovery Factor Offshore Statoil experience and ambitions

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Agenda

- Introduction/background
- Riserless Light Well Intervention (RLWI)
- Category B

Taking on the High Recovery Challenge



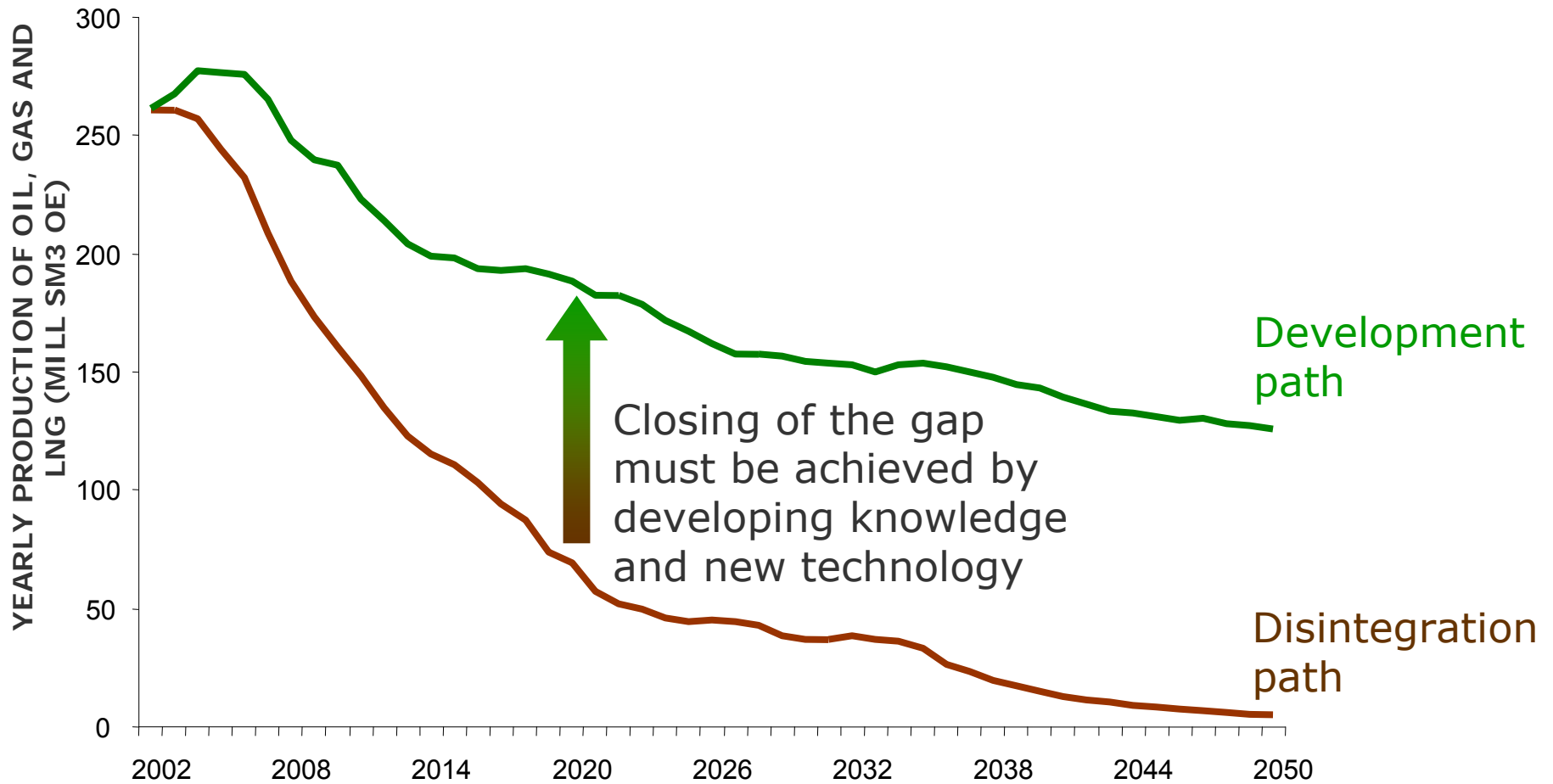
Beautiful



but demanding



Technology and production

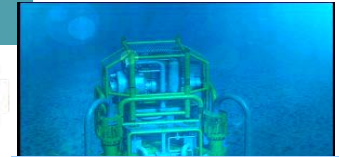
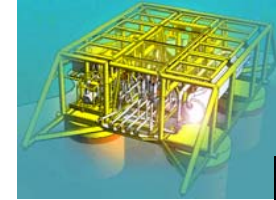


Optimising reservoir recovery from subsea fields



Ambition:
increase subsea
recovery

- Increased fluid handling capacity
- Reduced wellhead pressure
- Integrated Operations
- Identify
 - Drainage points
 - Well intervention needs and opportunities



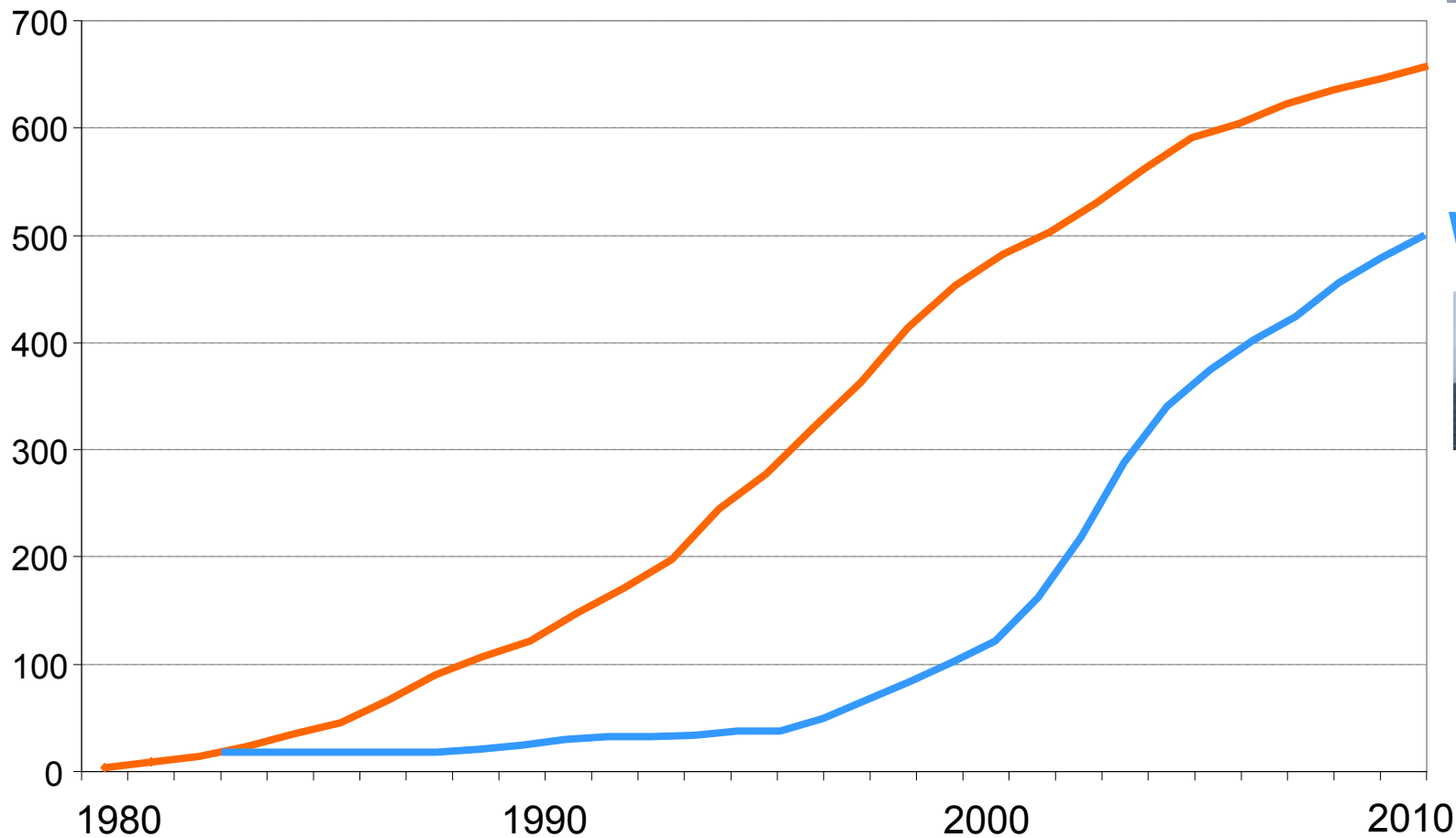
Cost effective drainage & well
intervention

Cumulative wells – Statoil NCS

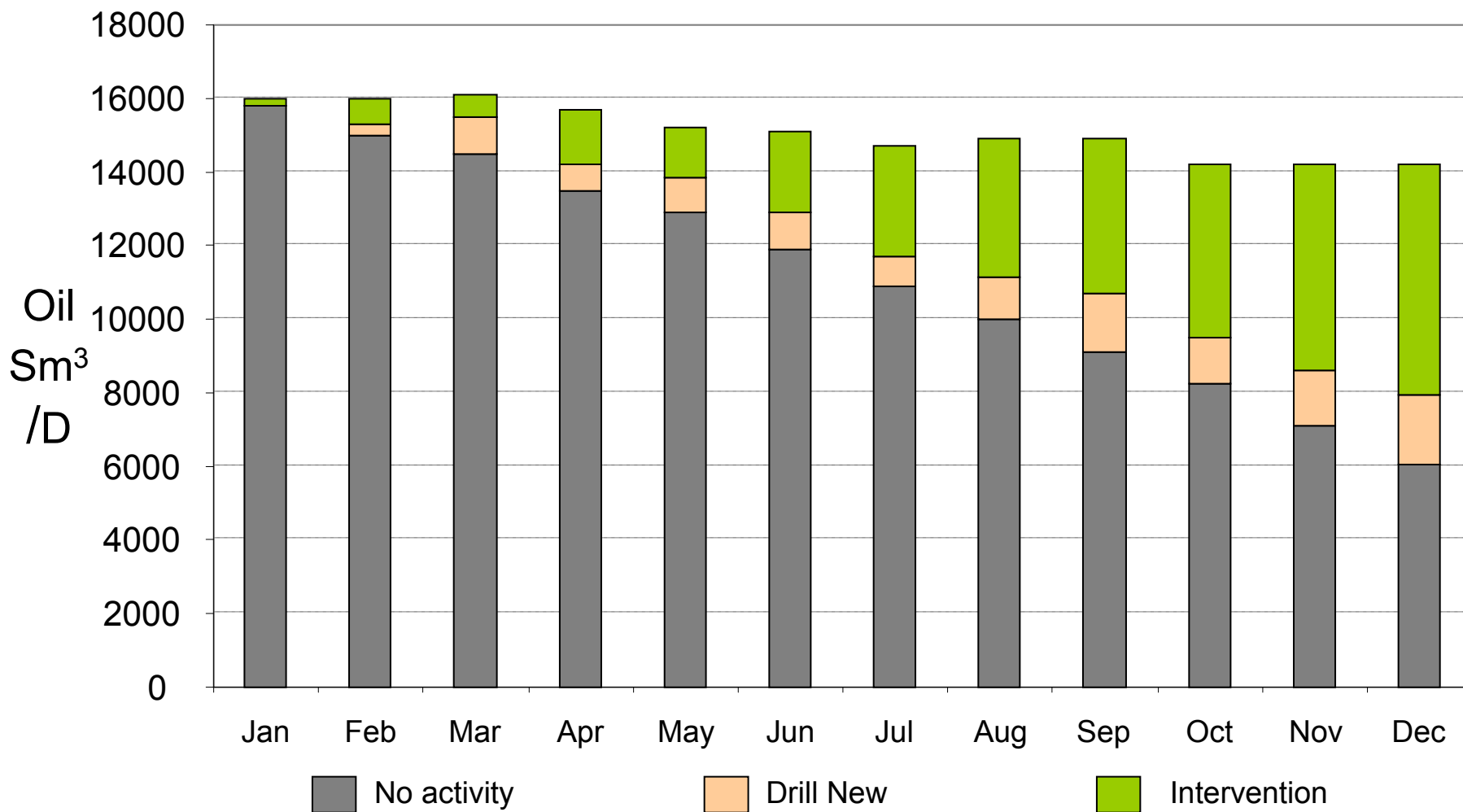


Dry trees

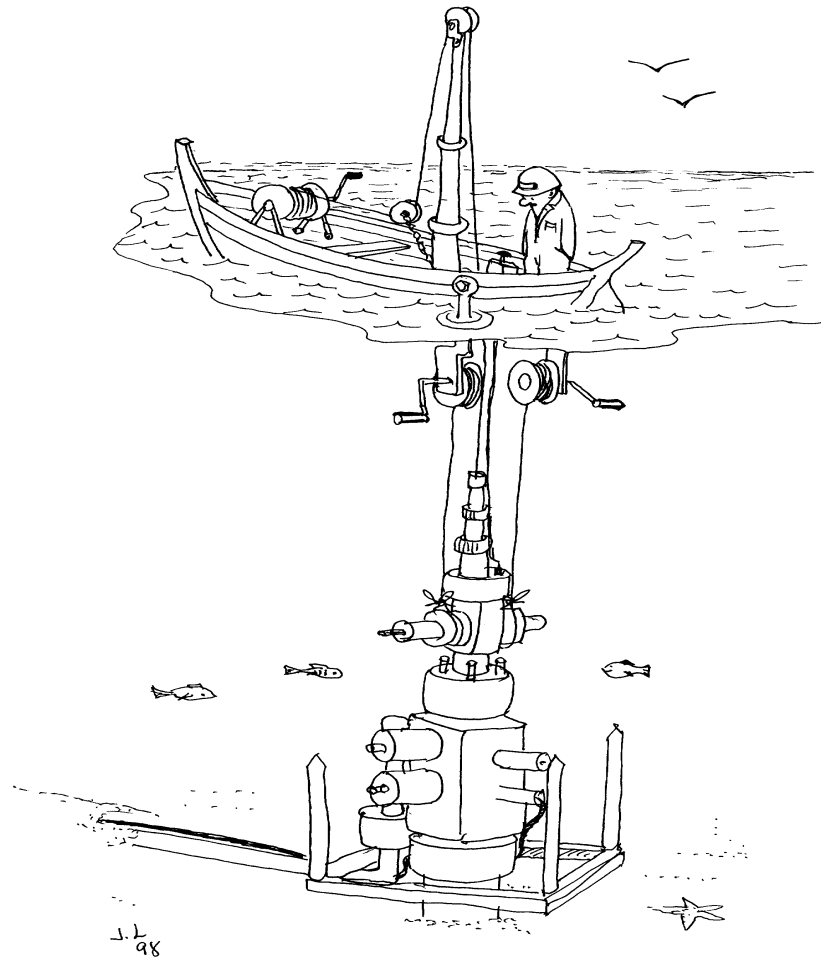
Wet trees



Impact of well intervention – mature asset



RLWI

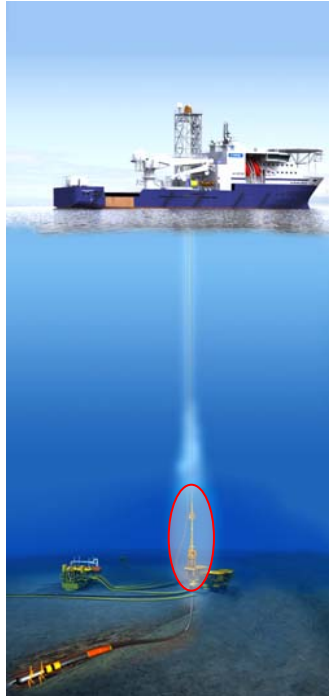


What is RLWI ?



- RLWI = Riserless Light Well Intervention
- Subsea wireline operations from well intervention vessel

Island Wellserver Mark II stack



PCH – Pressure Control Head

Installation package #3 (w/ wire line tool string)



LS – Lubricator Section

Installation package #2



**ULP & LUB TUB –
Upper Lubricator Package &
Lubricator Tubular**

LLP – Lower Lubricator Package

WCP – Well Control Package

Installation package #1 (w/XT adaptor)



RLWI- one of the tools to help us reach our goal in IOR



RLWI operations with subsea lubricator for wireline work, with or without a well tractor

Typical applications:

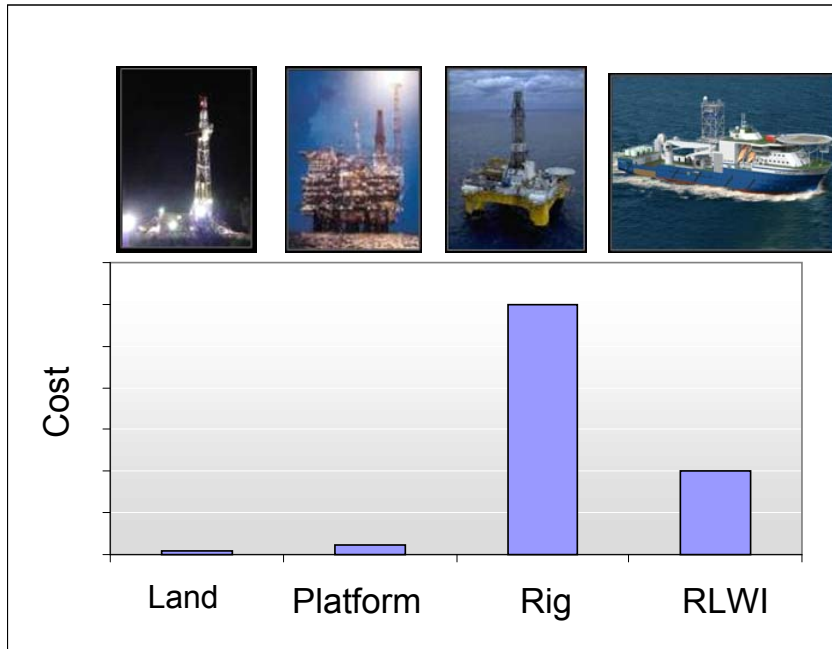
- Data gathering (PLT)
- Perforating
- Zone isolation (plug/straddle)
- Chemical treatments
- Inspection/repair (DHSV)

Enables the application of well tractor technology in subsea wells at a substantially lower cost compared to conventional rig operations

Other applications

- Camera inspection
- Calliper logging
- Well killing operation
- Change-out of gas lift valves
- Sleeve operations – DIACS valves
- Fill / debris removal (power suction tool)
- Well barrier re-establishment prior to rig workover
- Milling of scale bridges
- Installation/replacement of subsea trees (VXT)
- P&A operations of subsea wells

RLWI – cost effective wireline solution



Compared to interventions from a semi submersible rig:

- Reduced operation cost
- Reduction in operating time
- Increased WOW

Resulting in:

- Reduced cost per intervention
- Enabling more interventions that otherwise would not have been performed (typical data acquisition)

Development 2000 - 2010



MSV Regalia
(2003)



MSV Seawell
(2000 & 2004 - 2005)



Island Frontier
(2006 ⇨)



Island Wellserver
2009 ⇨)



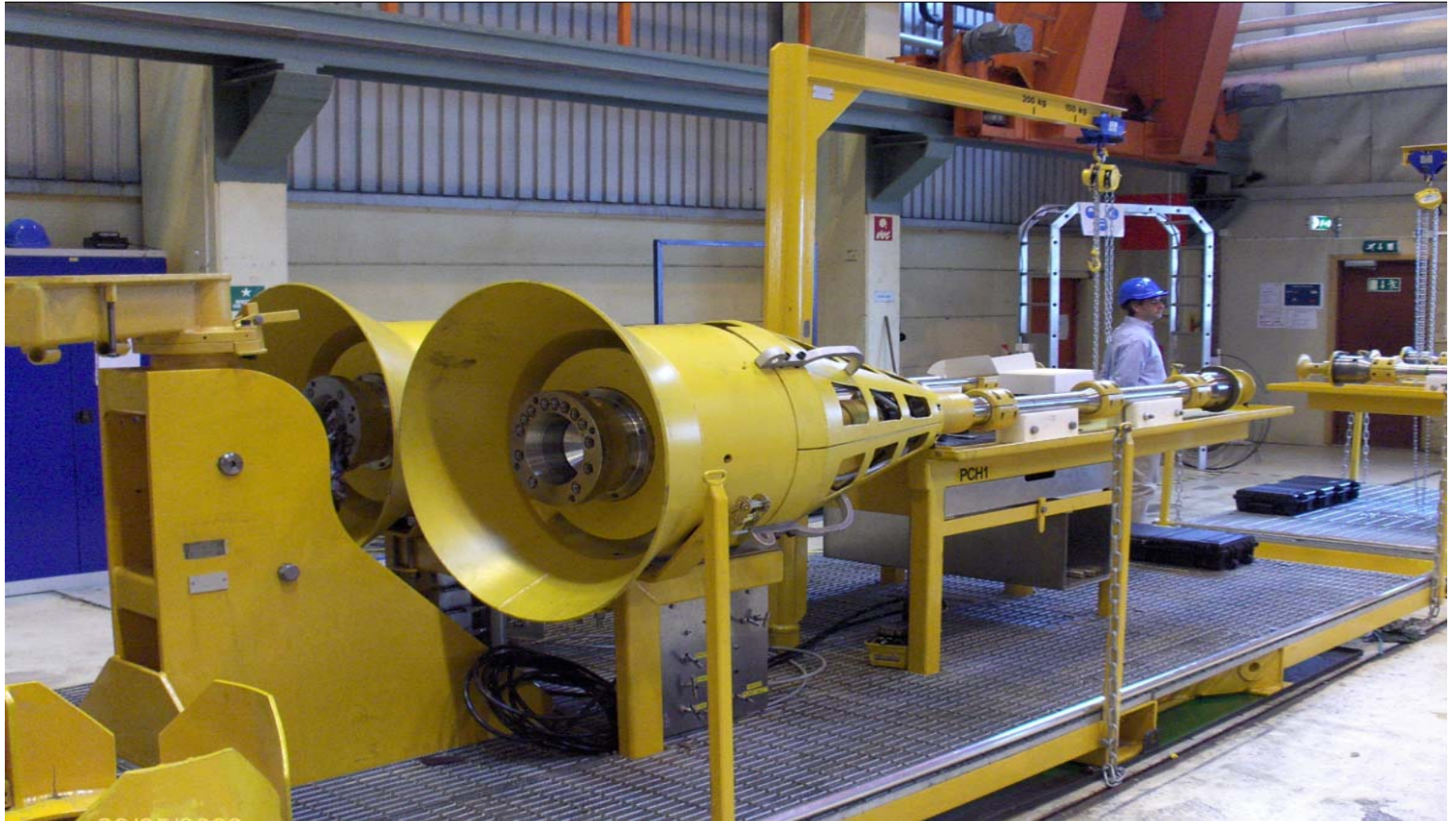
Operational overview

•2000	-	8 wells
•2003	-	3 wells
•2004	-	4 wells
•2005	-	11 wells
•2006	-	11 wells
•2007	-	17 wells
•2008	-	13 wells
•2009	-	25 wells
•2010	-	36 wells

- VXT and HXT
- Water depth: 75 – 405 m



PCH



Lubricator section



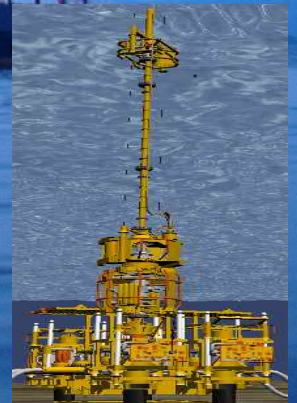
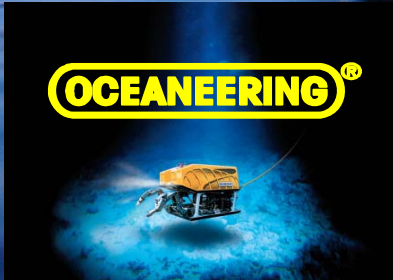
RLWI alliance



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Integrated operations – IO for RLWI operations

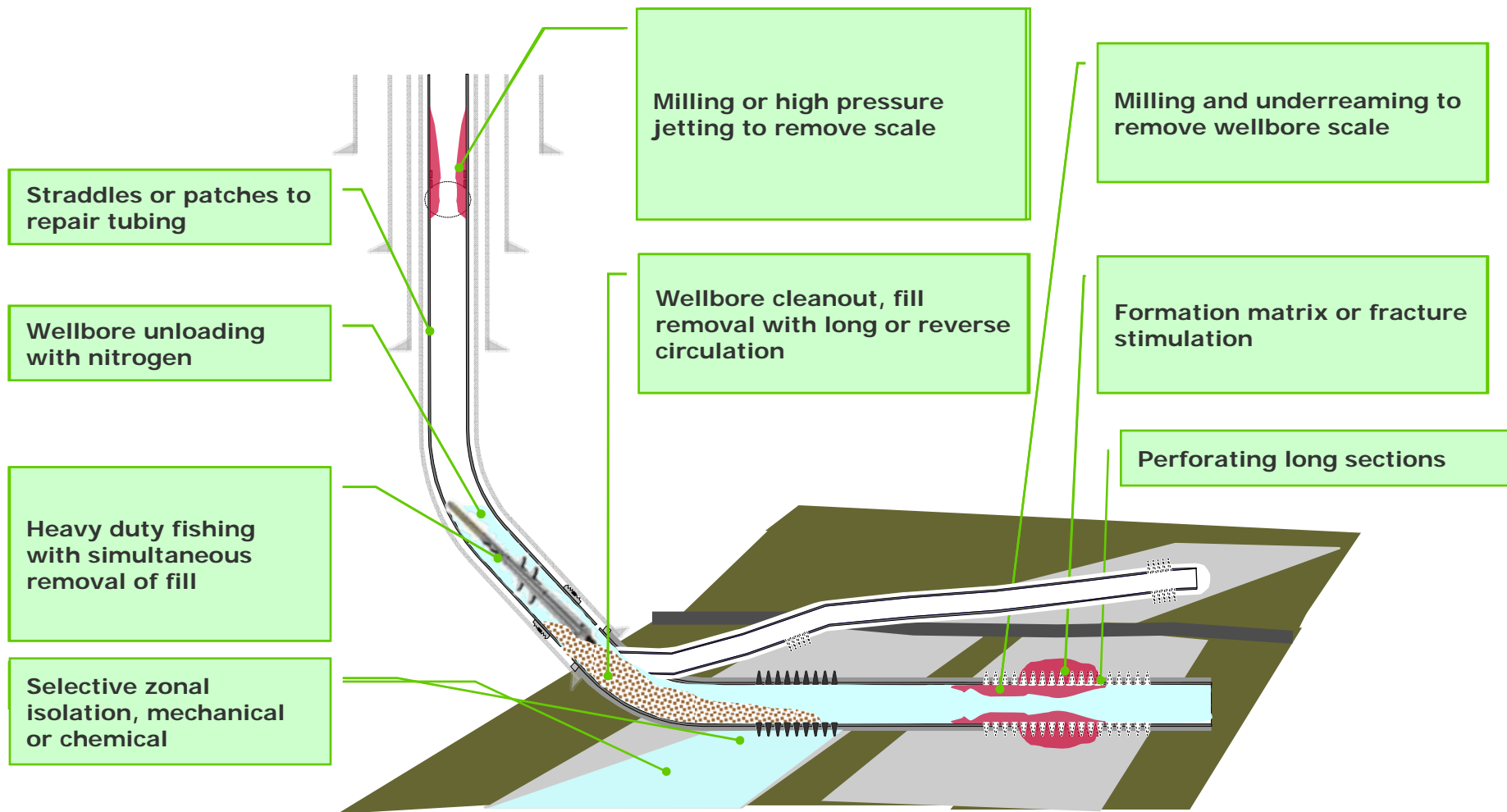


MSV Seawell - in operation

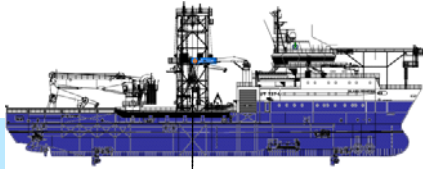


Category B

Addressing challenges – realising opportunities

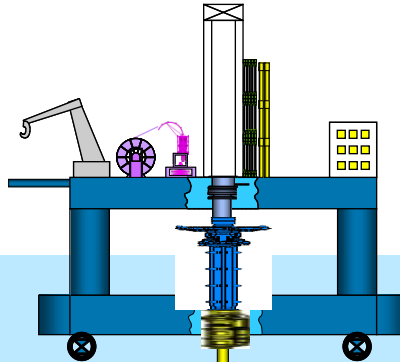


Category A RLWI



- Wireline / tractor only
- Limited bha length

Category B Heavy intervention & TTD

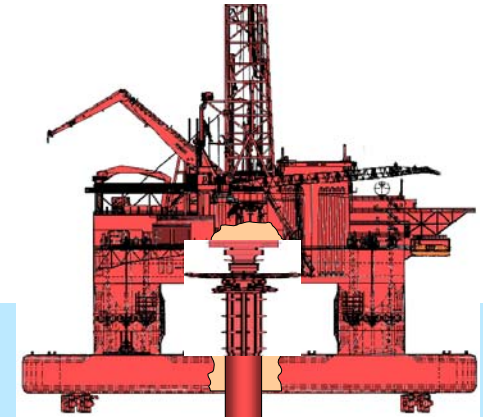


High pressure
light weight
riser (8-5/8")

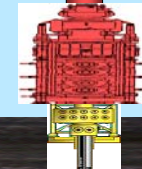


- Full range of
through
tubing
services

Category C Drilling and completion



Low pressure
marine riser
(21") standard
HP concentric
riser and SSTT
required for
live well
intervention



- Limited live
well through
tubing
services

Cat B – fit for purpose concept

Integrated high capacity coiled tubing package (2 7/8" / 3 1/2")

Topside system sized for through tubing operations (2 7/8" & 3 1/2" drillpipe)

Semi-submersible rig hull type

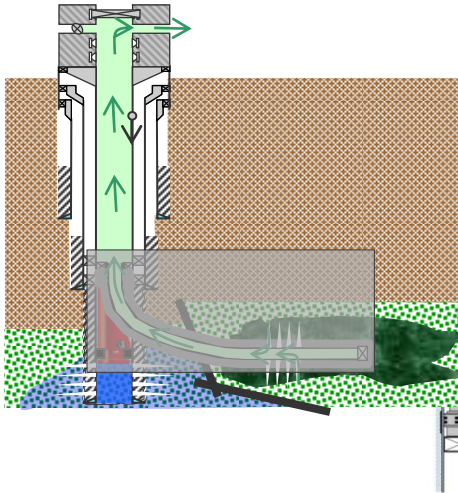
Full handling of live well returns

Lightweight HP riser system (through tubing)

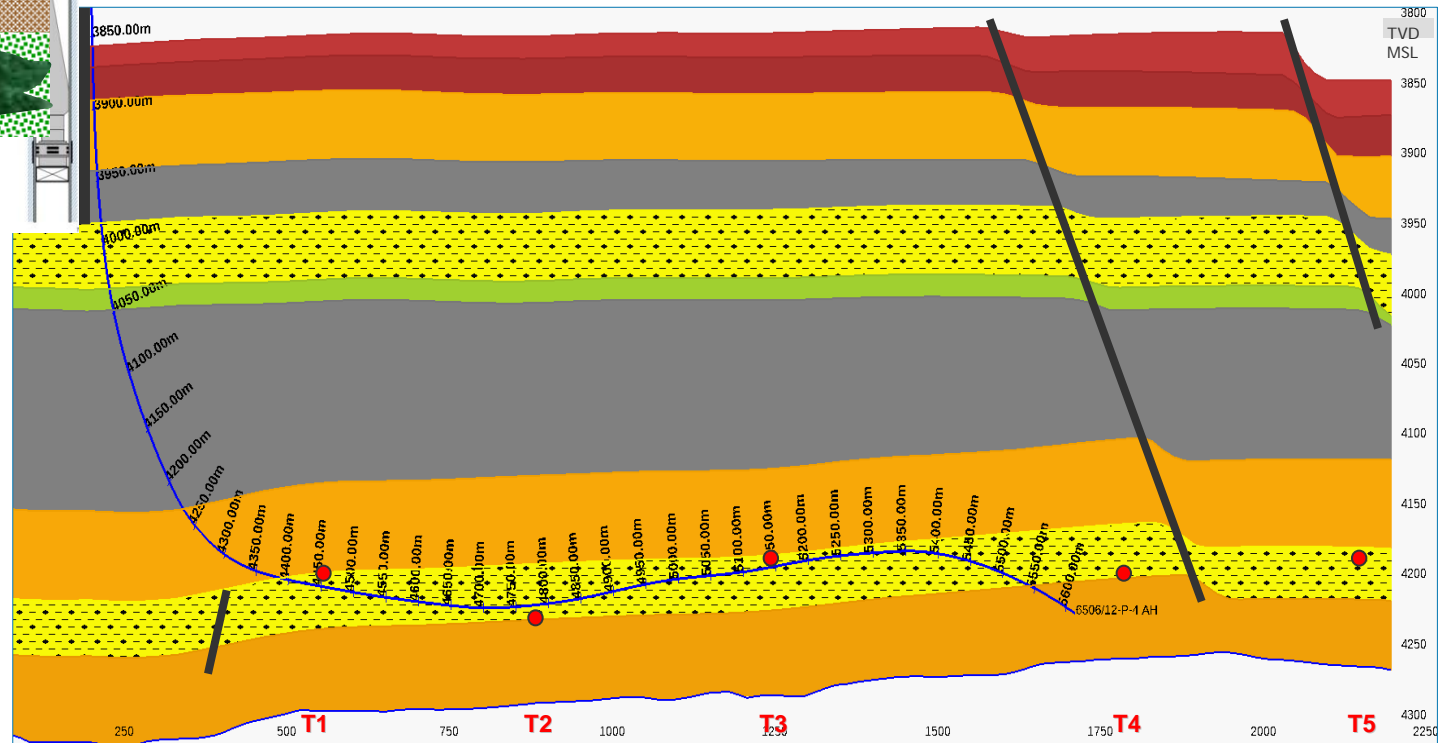
Full DP or mooring assisted station keeping options



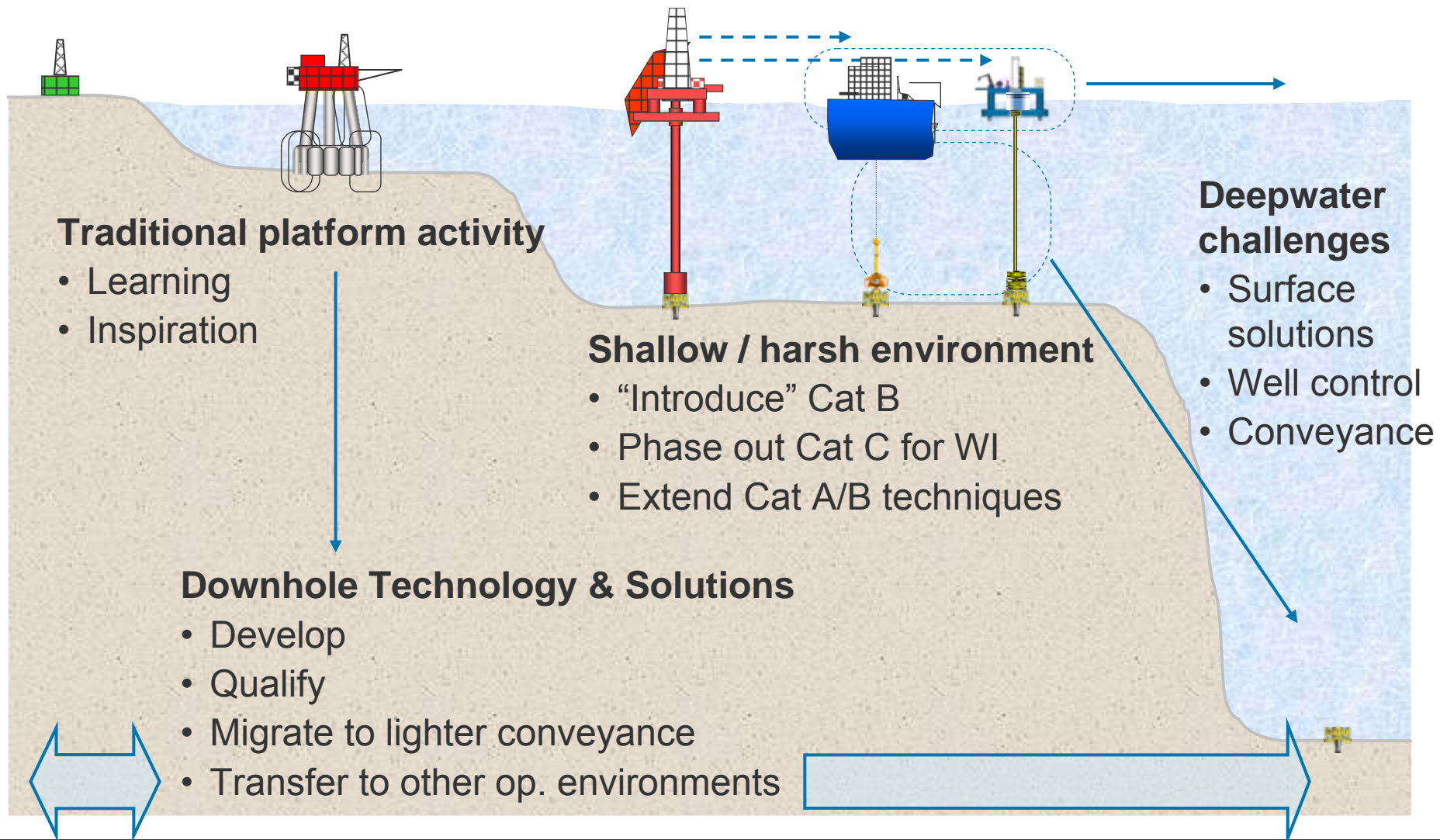
Work in progress



A record 1744m long through tubing sidetrack



Strategy for subsea well management



Thank you

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Statoil experience and ambitions

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Statoil Well Technology

www.statoil.com