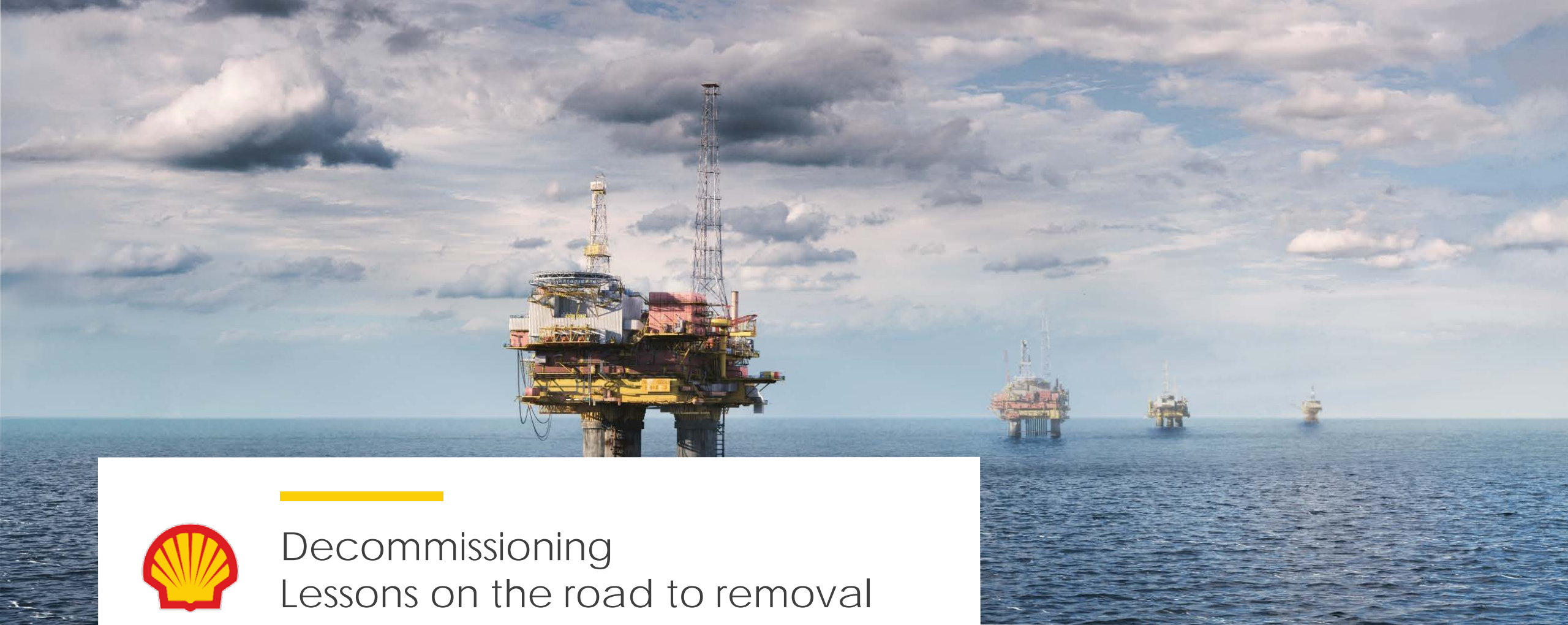




Brent Decommissioning – the Road to Removal

DUNCAN MANNING
BRENT ASSET MANAGER
SHELL U.K. LIMITED



Decommissioning Lessons on the road to removal

Duncan Manning
Brent Asset Manager

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Overview

Overview of
the Brent Project

Decommissioning
lessons learned so
far

Lesson application –
Alpha, Bravo &
Charlie

Delta lift

Brent Decommissioning Remains a complex major engineering project

Cessation of production

- Delta 2011
- Alpha, Bravo 2014
- Charlie TBC

Interdependencies

Alpha, Bravo & Charlie have multiple interconnections & interdependencies, including Penguins field

Brent facts

- 56 wells
- 3 topsides (826kT)
- 2 subsea locations
- 1 steel jacket
- 3 GBS
- 28 pipelines

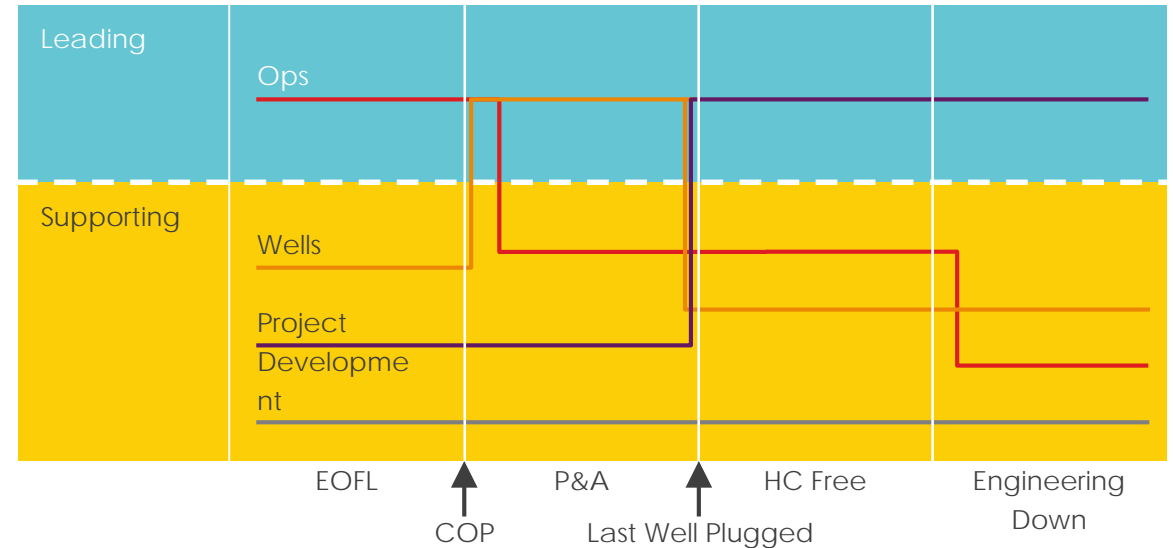
What did we learn from Delta? Overcoming pitfalls



Tight management of EoFL phase for decom success – of all metrics



- Start early - CoP is often triggered by an unplanned event – Be Ready!
 - Reduces some risk and ~20% maintenance hours but utility reliability is crucial; cranes, power, safety systems
 - Prioritise decom work appropriately pre-COP: it's a major opportunity to get into a project mindset
- Early strategic decisions will have a major impact to overall Decom costs



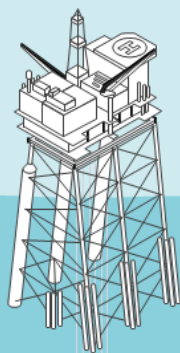
- Freeze engineering solution at the right time, continuous improvement mindset preserves value
- Engage market in Decom solutions: Monitor market conditions to optimise: early input from supply chain
- Organisation Design / People / Skills Planning: improve collaboration between Project / Ops / Wells

Wells P&A

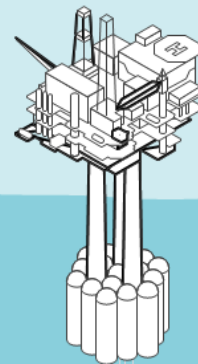
Shrinking the critical path

- Traditionally >40% of decommissioning costs are associated with platform P&A
- New ways of working are driving down costs (Well P&A) and duration (post COP Opex):
 - Individual Well-appropriate barrier philosophy
 - Suitable platform focus
 - POB – Integrated rig and asset crew
 - Application of new technology / techniques
- Recognise the hierarchy of value drivers – least to most valuable:
 - Wireline P&L before P&A
 - Wireline P&L concurrent with P&A
 - Commence P&A before CoP

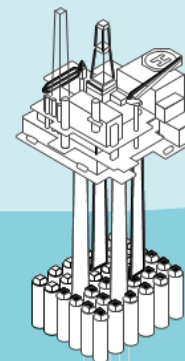
ALPHA



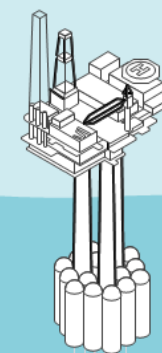
BRAVO



CHARLIE



DELTA



Examples of innovative delivery



Application to Alpha...

Rapid lesson delivery

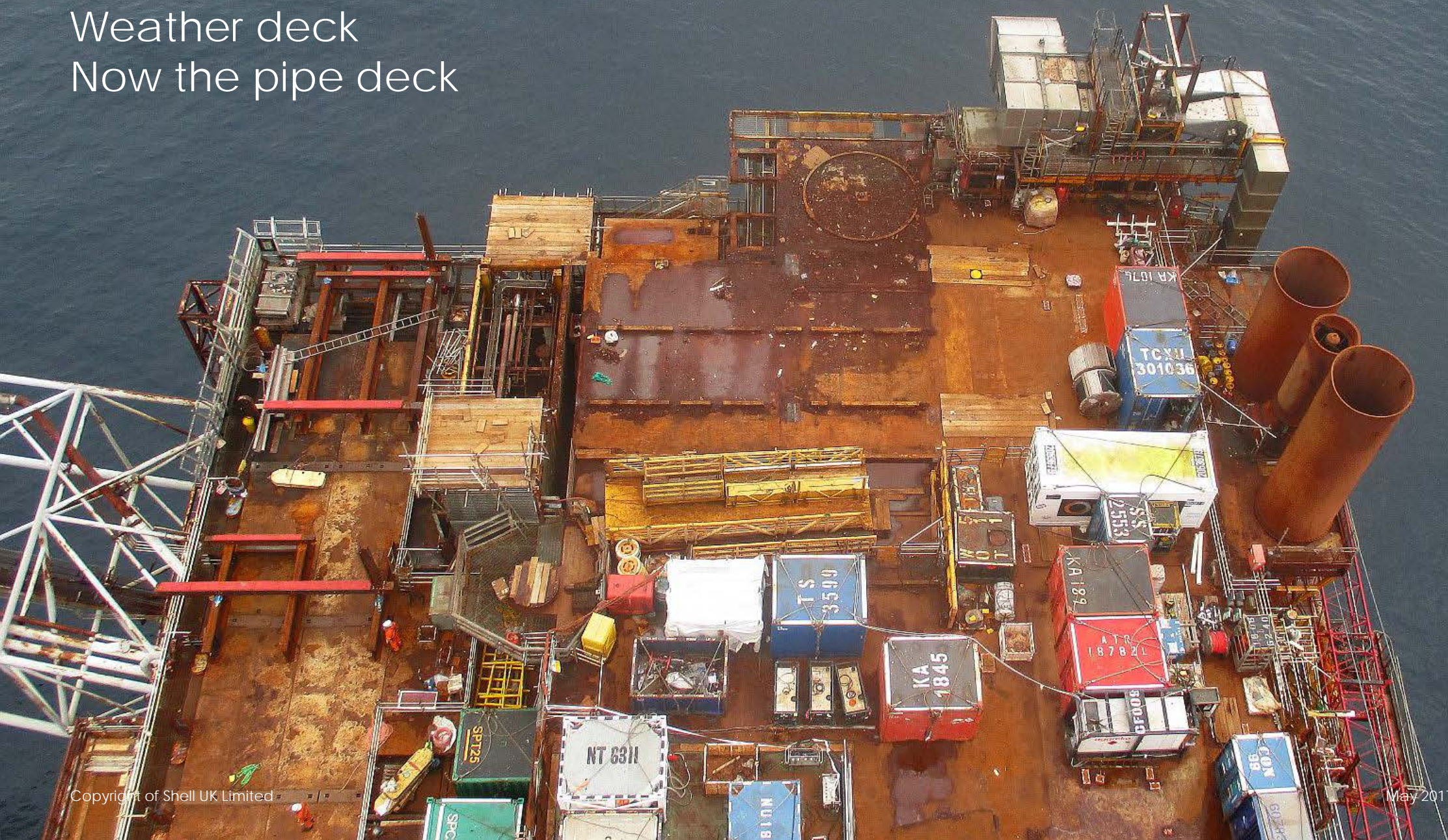


Making space for decommissioning

Piece small and single lifts of Production modules



Weather deck
Now the pipe deck



Investment in
a new crane
Fewer weather
downtime days



And Bravo...?
New ways of preparing



Single lift

Alternative approach to lift points



New style of lift points

Underside of Brent Bravo –
Introduce 6 mass concrete
lift points (in blue)



Decommissioning
preparations are well
underway



Lift box construction




Utility leg clearance



Conductor recovery



Delta lift reflections
The culmination of engineering
excellence

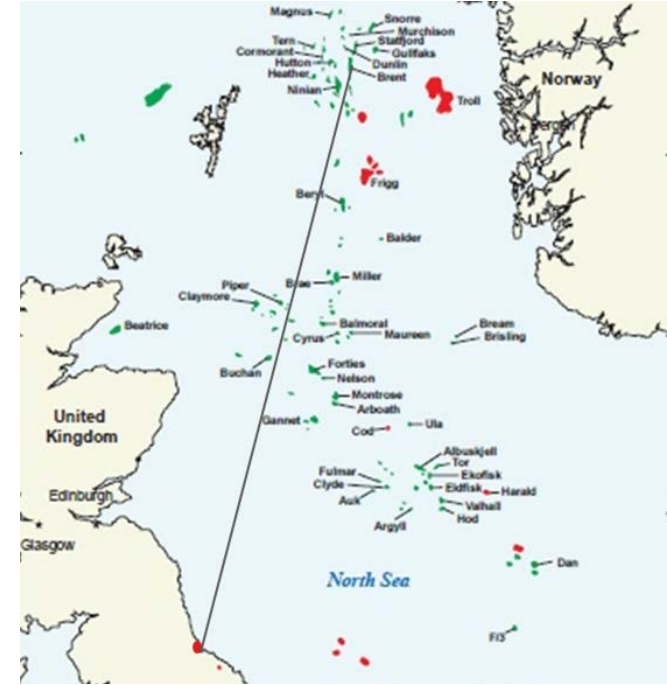
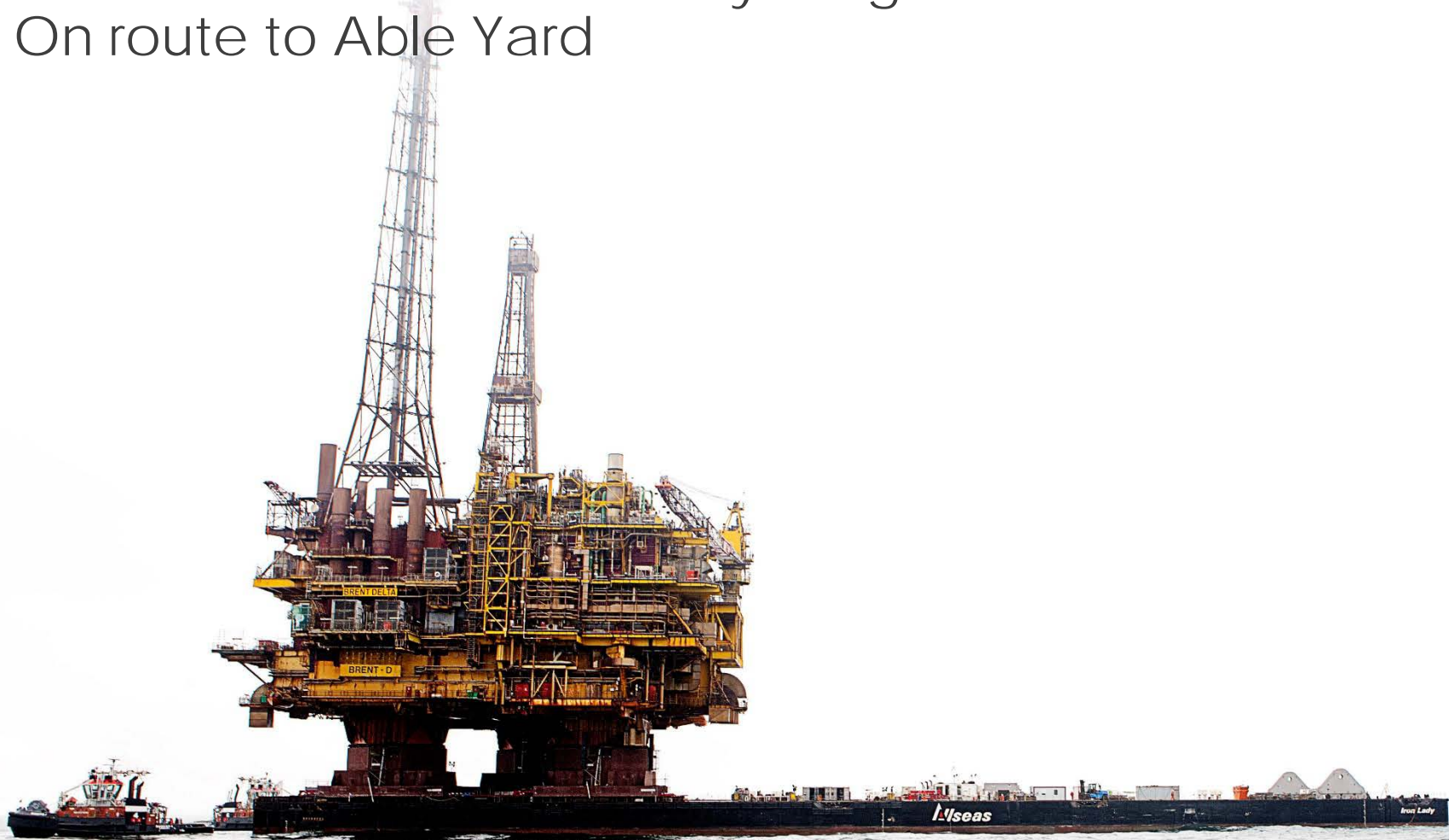


Pioneering Spirit
Moves in for the lift

The moment of lift



Delta loaded onto Iron Lady barge On route to Able Yard



Media interest At the quayside



Delta
Awaiting transfer to Able quayside



Delta Skid to quayside





The derogation request



