

Managing Mega Projects

Wed 6th July, Martin Urquhart – Project Director

Overview

13,500psi, 350°F, 500 MMscfd
6 Development Wells / 1 PWRI well

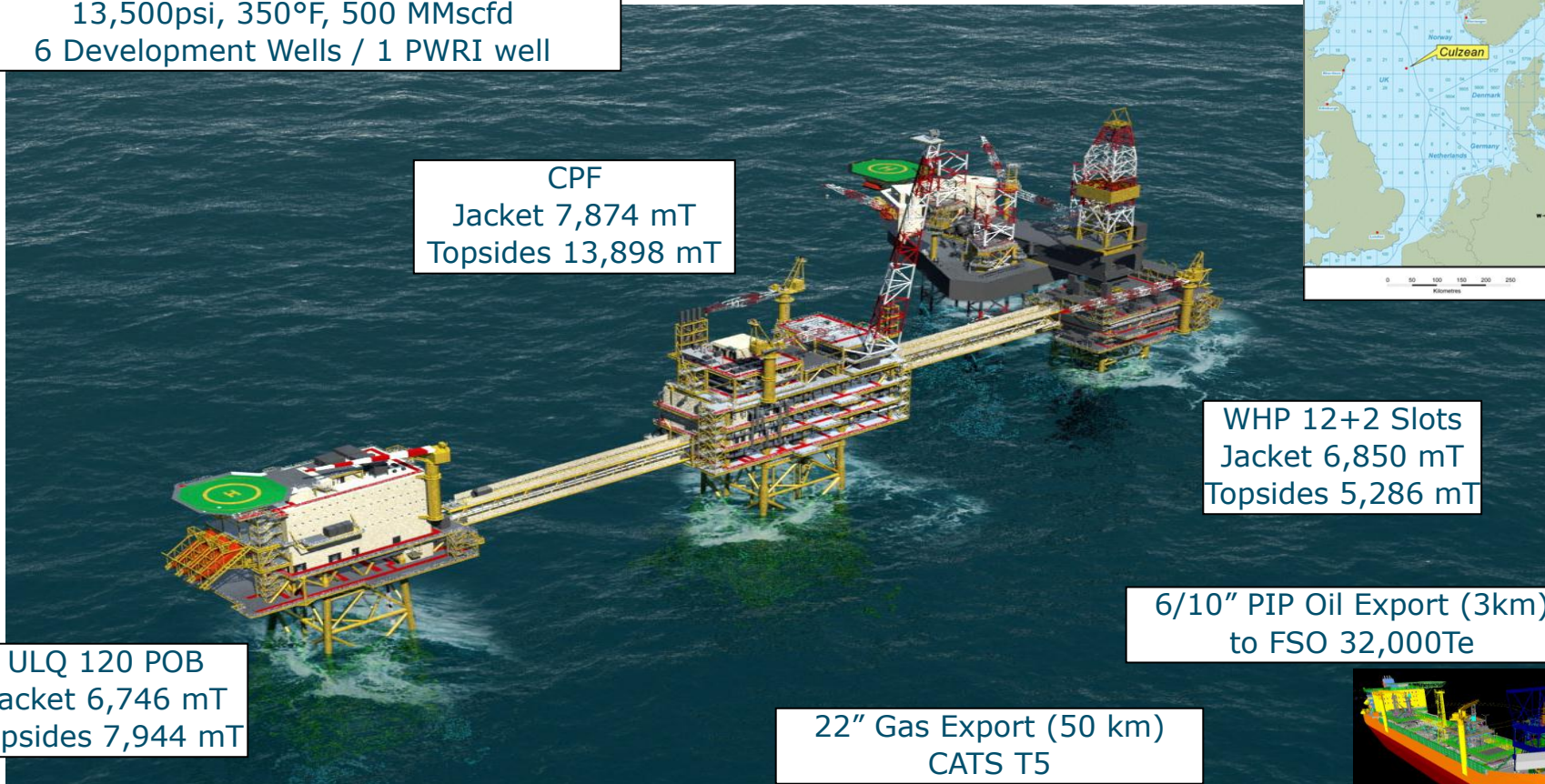
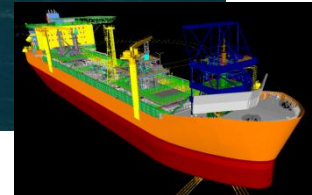
CPF
Jacket 7,874 mT
Topsides 13,898 mT

ULQ 120 POB
Jacket 6,746 mT
Topsides 7,944 mT

22" Gas Export (50 km)
CATS T5

WHP 12+2 Slots
Jacket 6,850 mT
Topsides 5,286 mT

6/10" PIP Oil Export (3km)
to FSO 32,000Te

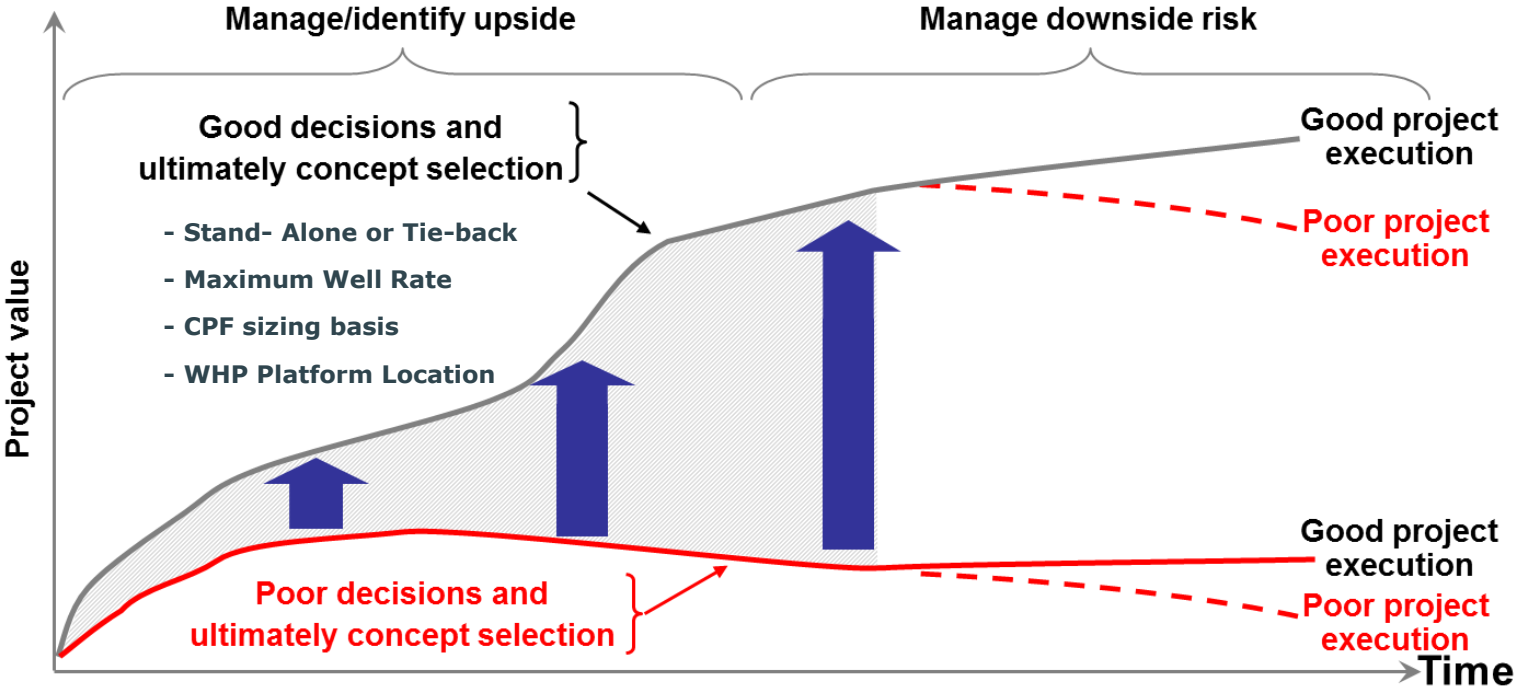


Managing Mega-projects: Addressing the Industry Challenge

- ~80% of E&P Mega-projects fail in cost, schedule and production dimensions
- Failure Criteria are High:
 - +25% on Cost or
 - +25% on Schedule or
 - Major Production Issues 2yrs post start-up
 - Mostly in a combination of 2 or more!
- Root Causes Identified:
 - Lack of Front End Loading (FEL)
 - Schedule Aggressiveness
 - Director Turnover/Team Integration



Gated Process Driving Front End Loading in Assess/Select

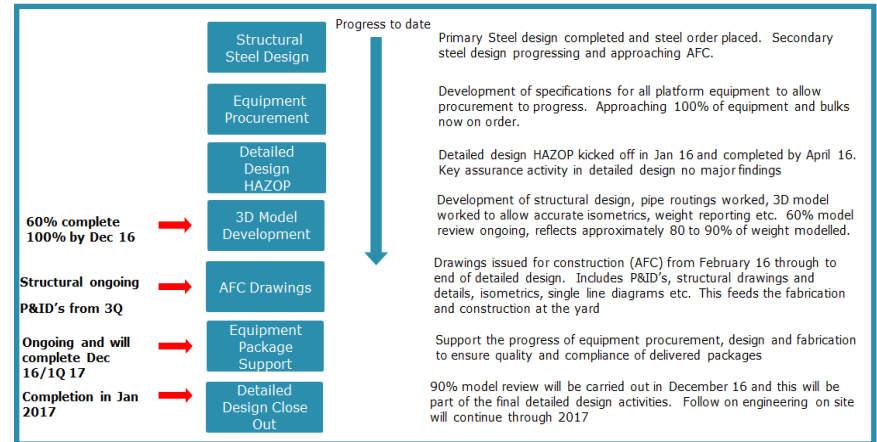
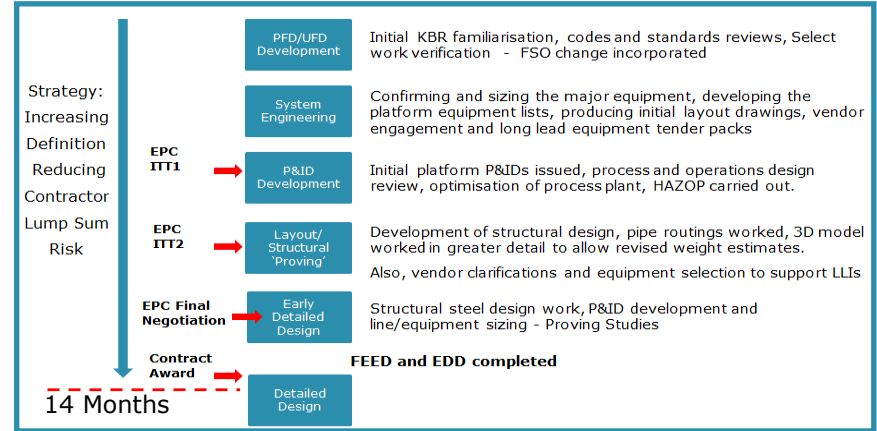


Draft FDP

IP (Investment Proposal)

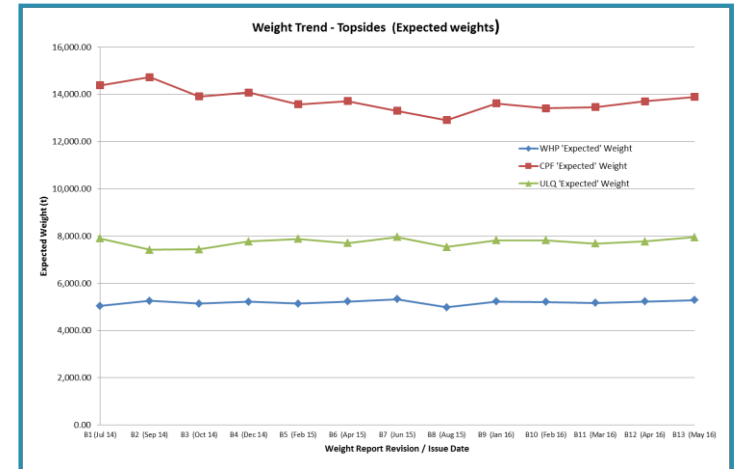
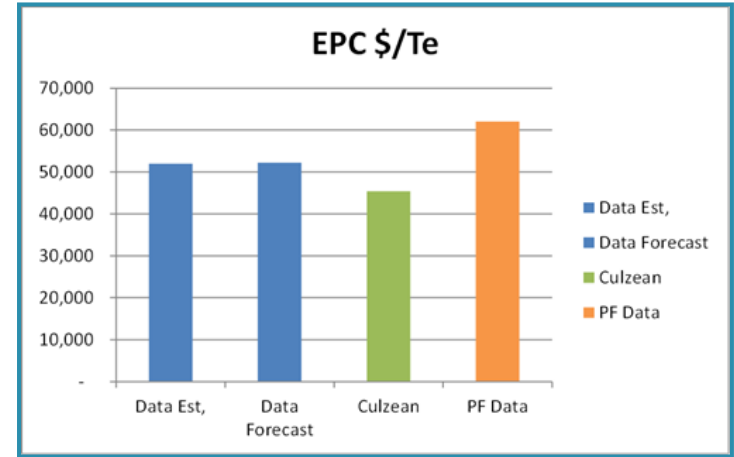
Contracting Strategy FEL Objectives in Define

- Maersk Oil preferred – Lump sum EPC
- EPC Premium/Contractor Risk must be balanced
- Full FEED a minimum requirement
- Cost 'rule of thumb' – 1-3% of Overall Project Cost
- Schedule for a Mega Project FEED 1-2yrs
- Schedule/Quality risks mitigated by purchase of 21 Long Leads worth ~\$250MM
- FEED focus led by Contractor Feedback
- Contractor Continuity desirable but not essential
- 90% of Primary Steel ordered 13 weeks after Contract award



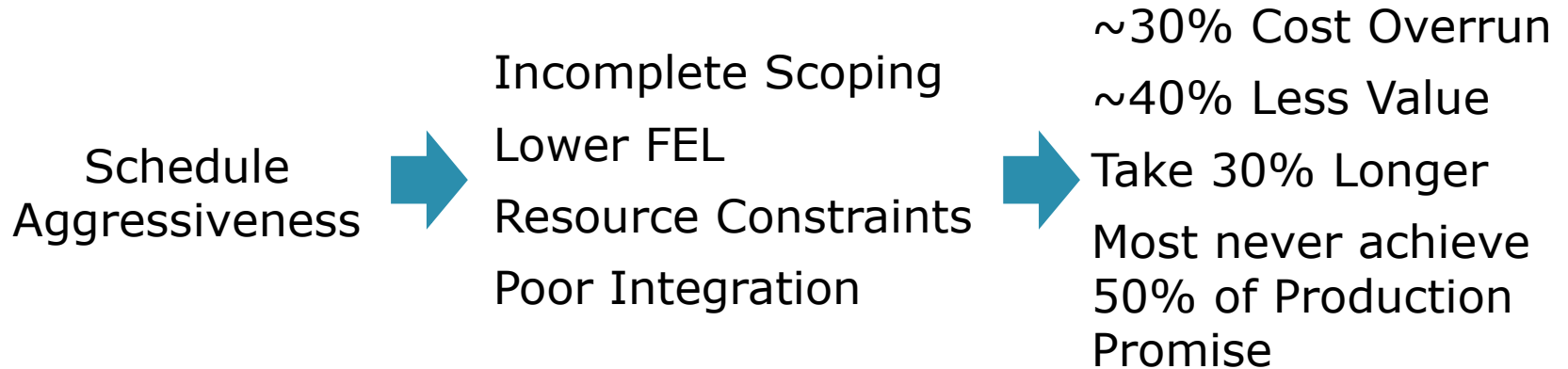
Results and Evidence

- Costs between ITT1 and ITT2 fell considerably
 - Up to c 35% reduction
- Simply benefiting from market timing/deflation?
 - 1yr after Oil Price UCCI dropped 15 % (2009)
 - Fell further 3% to 18% (2010)
 - Culzean tendered in '15% Window'
- Any reduction beyond deflation is Premium reduction
 - Least Risk Averse Tenderer = 35-15% = 20%
 - % = Difference between 'lite'/full FEED EPC Premium
 - FEED 'lite' statistically proven root cause of E&P failures
- Weight = Cost
- Topsides weights stable 9months into detailed design
- Good For Culzean – Good for Supply Chain Partners



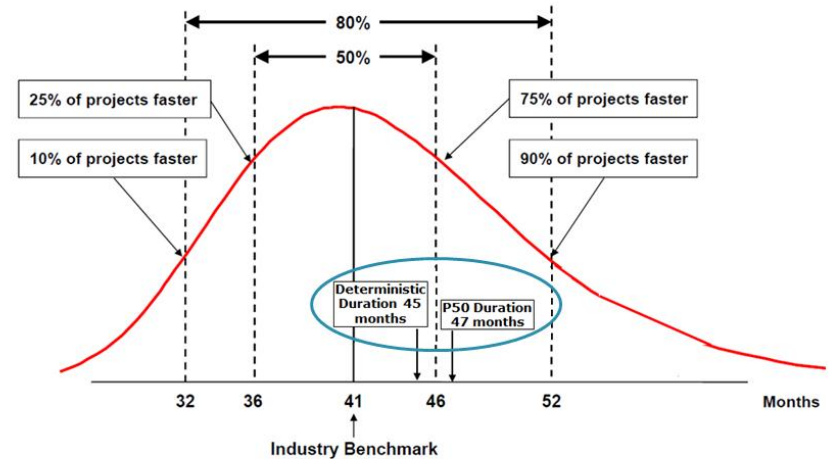
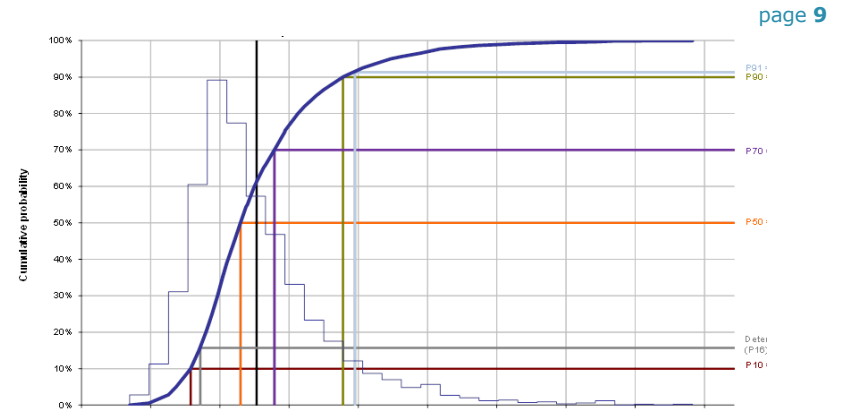
- **What is the problem?**
 - Project plans and budgets are often created using an **'everything goes right' mentality**
 - **Options are discouraged** to meet time and cost pressures
 - **1st Oil dates already communicated** to key stakeholders **'schedule driven'** project
 - **PM bias to deliver**
 - Project teams usually do not have a shared understanding of the **dependency between their activities** and the rest of the project
 - The **impact of individual activities** on an overall project is often **counter-intuitive**
 - Schedule Analysis complicated by **organizational and individual biases**
 - **Lack of clarity and transparency:** Detailed schedules and cost estimates are often only understood by a small portion of the project team
 - Plans made in isolation/silos, not integrated across full cross-functional business and technical disciplines – **PM Bias to 'Ignore' non technical functions & Stakeholders**
 - We want to be **boxing not surfing.....**

Schedule Aggressiveness – Data from IPA



Schedule Aggressiveness

- Facilities Team - Deterministic Schedule
- The Ask - I want a schedule you'd put your house on!
- Project Services Team - Risked Probabilistic
- Independent Benchmarking - IPA
- Range Narrows with Contracts Awarded
- Deterministic Plan is a P16 Outcome!
- Facilities Team Homeless!
- Overall benchmarking Culzean P50 is not Schedule Aggressive
- Project took similar approach to cost estimate
- Difference between P50 and P75 used to gauge contingency request

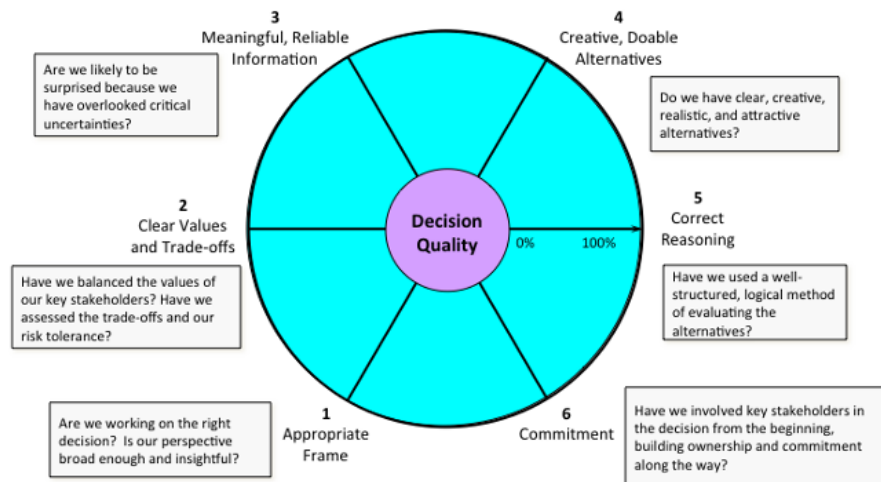
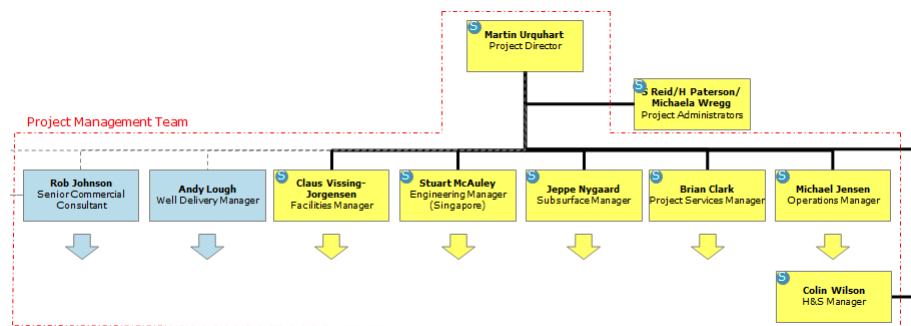


Culzean is not Schedule Aggressive

Example: Select Gate Option Benchmarking not Sanction Data

Director Turnover/Team integration

- Let's Focus on Team Integration/Dynamics
- Upstream E&P is highly Functional even in a Matrix Design
- Organization Design is Integration Critical
- Decision Quality is Integration Critical
- Framing determines decisions to be made
- Allocate decisions to cross functional teams
 - Drives integration and Integrated Solutions
 - Creates competition between Decision Teams
 - Verify Decision quality as part of the decision



Director Turnover/Team integration

- Create Dynamics to manage the 'Triple Constraint'
- Generate/Promote Healthy Tensions:
 - Engineering & Facilities = Quality & Schedule
 - Engineering & Operations = Quality & Cost
- Lack of Integration in Execute a real risk
- Disparate Project teams, focused activities

