

# Turning of the Tides



Adrian Luckins  
Vice President – Americas, North Sea & Global Subsea Systems  
BP

DEEPWATER  
EXECUTIVE SUMMIT



# The future of subsea

- Introduction
- BP's journey
- The next challenge
- Closing thoughts



# Introduction

**2.5  
Million**

Work hours delivering first class marine and subsea projects.



**150  
trees**

Current bp has around 300 subsea trees and a program for more 150 to 2025.



**18  
projects**

Number of additional projects that we have line of sight to through 2021.



**1500  
people**

POB offshore at one time working on 15+ vessels / 8 major projects.



**\$1Bn  
annually**

Subsea equipment and aftercare.



# BP's journey

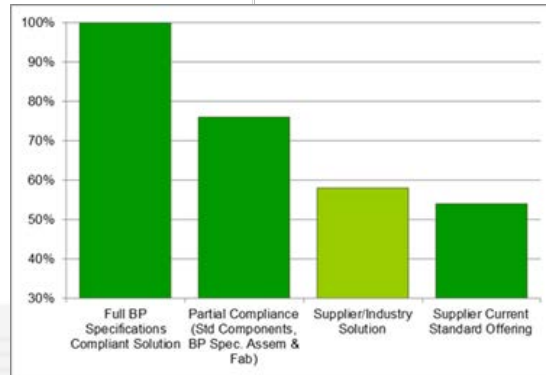
Cost/ Schedule

- Centralized Organizations
- Standardization
- Supplier Led Solutions
- After Market

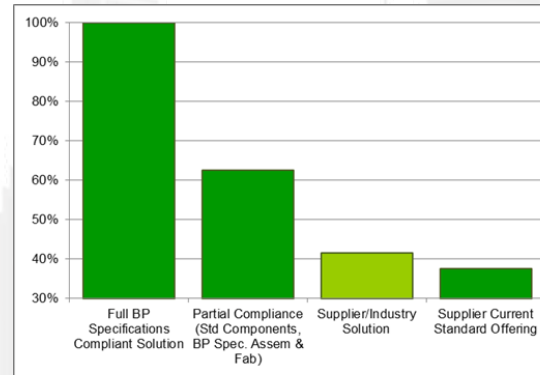
'What'



Standardization & interchangeability



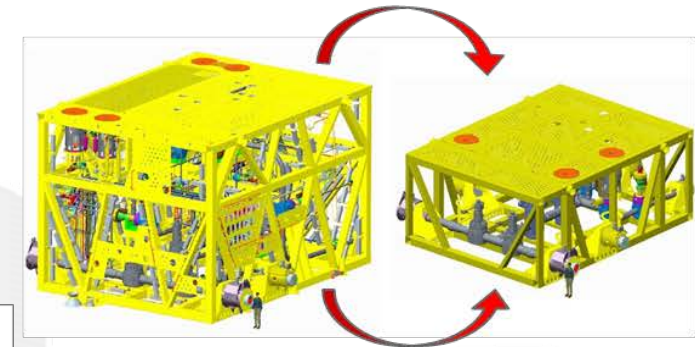
Equipment Cost



Equipment Delivery Schedule



Supplier-Led-Solution

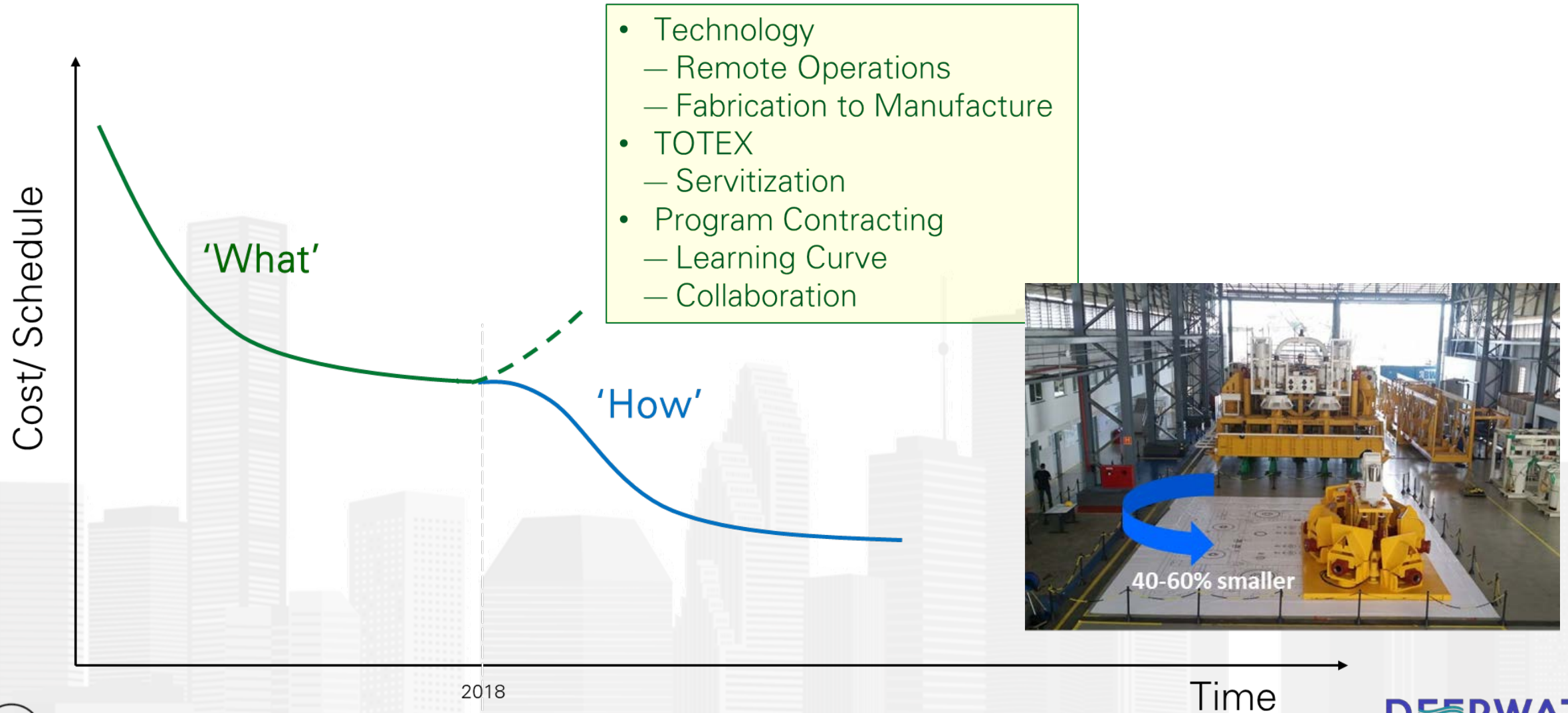


- Simplified design and 30% weight reduction
- Acceleration & reduced delivery risks

Time



# The next challenge?



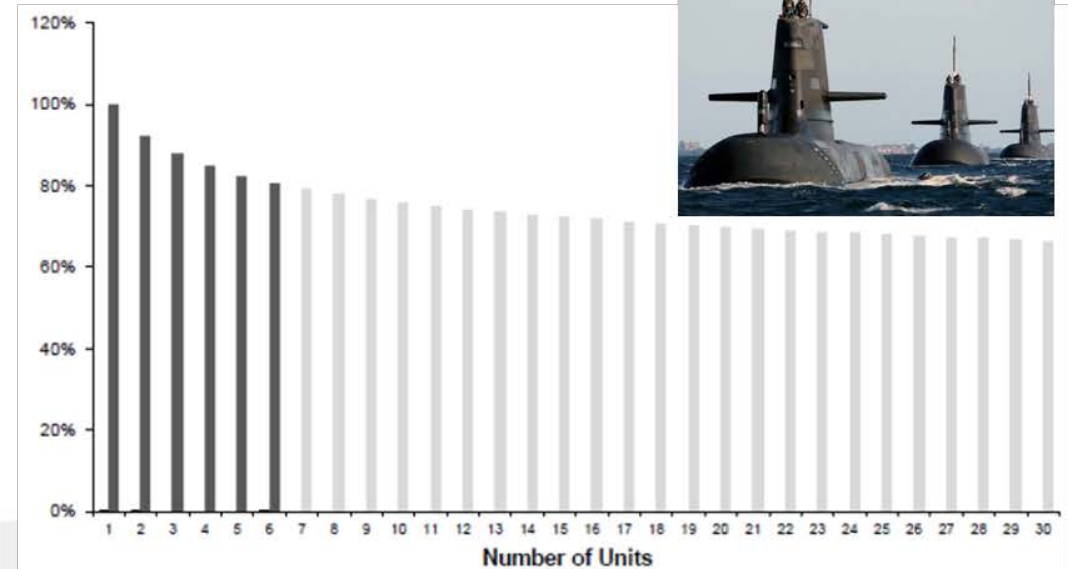
# The next challenge – enabling the learning curve



## Cumulative Average Theory

"If there is learning in the production process, the cumulative average cost of some doubled unit equals the cumulative average cost of the un-doubled unit times the slope of the learning curve"

- T. P. Wright in 1936 – Based on examination of WW I aircraft production costs



Source: Australian Submarine Corporation (2015)

Learning rate is generally between 80% and 85% in the shipbuilding sector which means a reduction in cost between 15% and 20% with every doubling of production (Stewart and Wyskida, 1995).



# The next challenge – enabling the learning curve

## Basic Learning Curve Equation

$$Y = KX^{-N}$$

Y = Cumulative average cost of X units

K = Cost of unit #1

X = Number of units produced

N = Learning Exponent

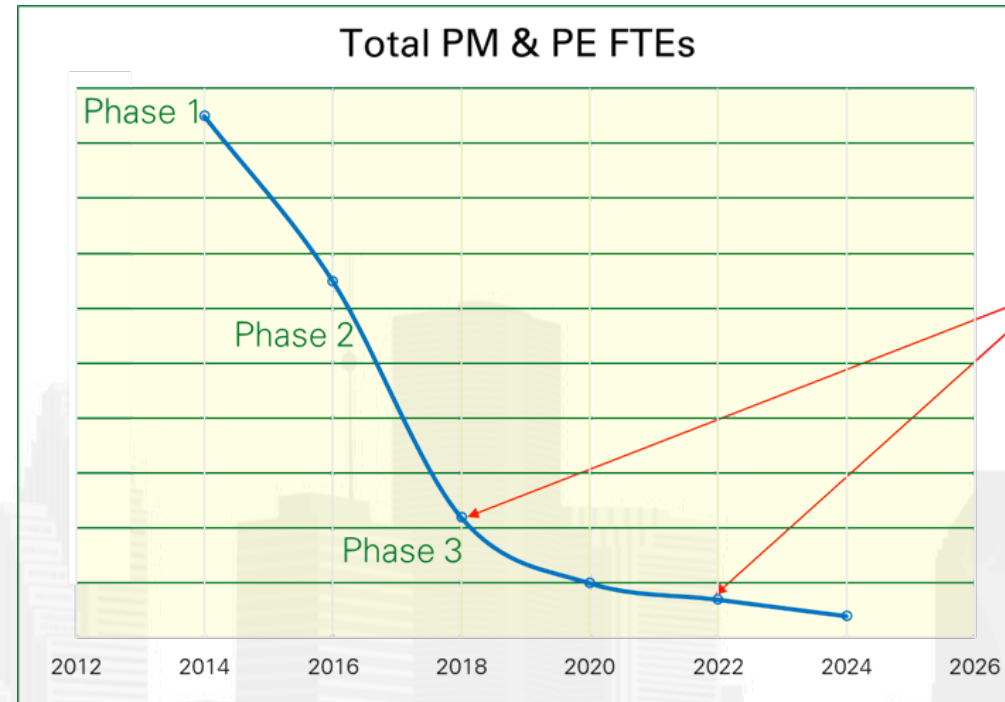
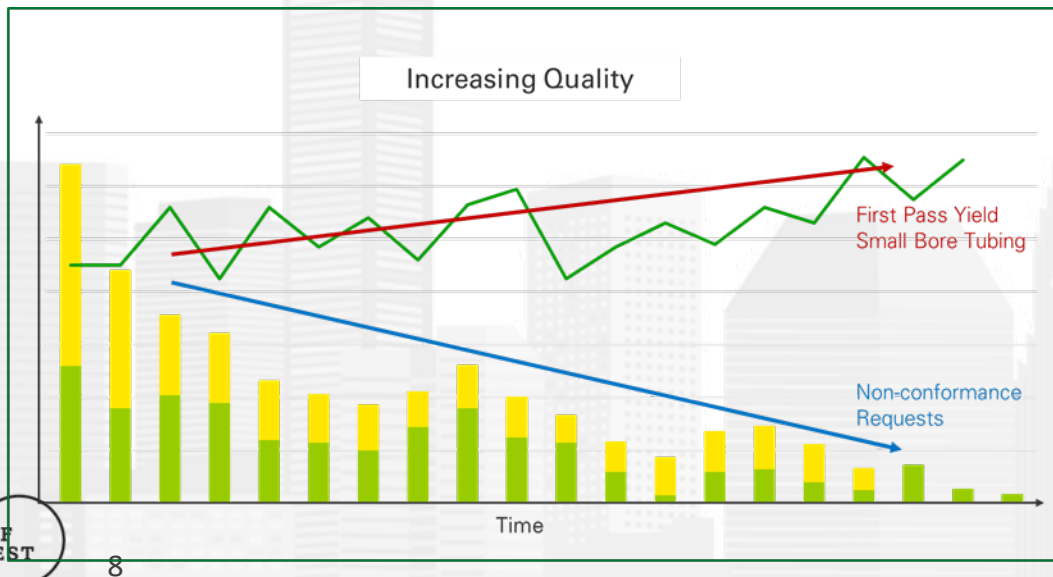
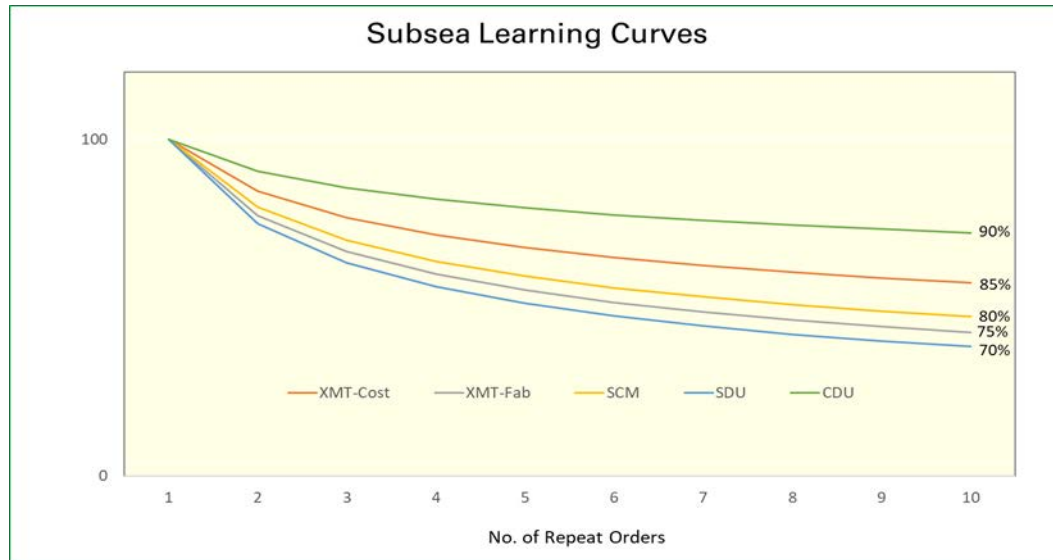
This equation shows the total average cost for all units through the Nth unit. However, the cost of each Nth unit parallels the average cost after 20 or so units.

## Representative Learning Rates

Aerospace	15%
Shipbuilding	15%-20%
Machine Tools (New Models)	15%-25%
Electronics (Repetitive)	5%-10%
Electrical Wiring (Repetitive)	15%-25%
Machining	5%-10%
Manual Assembly+25% Machining	20%
Manual Assembly+50% Machining	15%
Manual Assembly+75% Machining	10%
Punch Press	5%-10%
Raw Materials	5%-7%
Purchased Parts	12%-15%
Welding (Repetitive)	10%

Operations paced by people have steeper slopes than those paced by machines.

# The next challenge – enabling the learning curve



Repeat orders required significantly reduced level of PM&E



# Closing thoughts

- **Supplier-Led-Solutions work**
  - We have learned to standardize
  - Is it fully embedded in the 'industry DNA'?
- **Are we ready to address the 'How'?**
  - Programs vs. projects?
  - Collaboration becomes the new normal (SPS and T&I)?
  - Performance = delivering the learning curve?
  - Alignment of purpose through servitization (TOTEX)?
- **The enablers are in this room!**



