Synergies and Differences – An Offshore Contractor's View

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KBR – An Offshore Contractor

Renewable Energy

Operations & Maintenance

Onshore

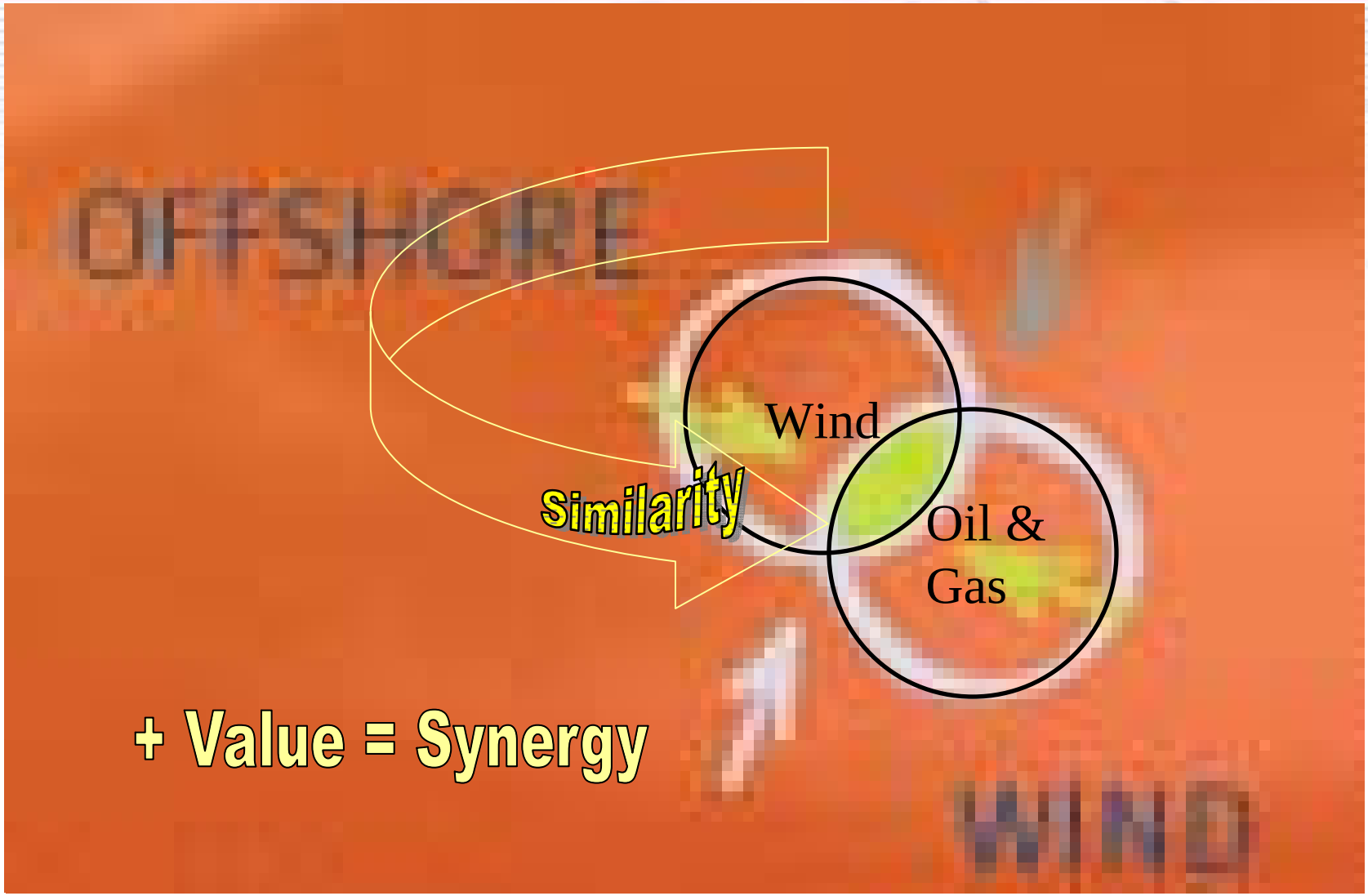
Offshore

Infrastructure

Government Operations

UK Employees = 12,000

Differences & Synergies



7 Differences

1. Offshore oil & gas is over 50 years old.
2. Oil & gas clients control the product.
3. Exploration and well drilling is expensive.
4. Oil & gas and wind are very different substances.
5. Oil & gas has manned facilities.
6. The wind turbine dominates the wind industry.
7. Wind is near shore and shallow.

7 Similarities

1. Similar people, processes and tools.
2. Offshore HV electrical systems, foundations, sub-sea.
3. Certification.
4. Many consents to be met.
5. Need for good, early information.
6. Need to meet changing affordability.
7. Need for equitable risk allocation.

Synergy nr. 1 End –to-end engineering

Examples

- Turbine tower – foundation – soils/scour
- Turbine –electrical system – grid compliance
- Safety case – access – structural

Synergy nr. 2 - Integration

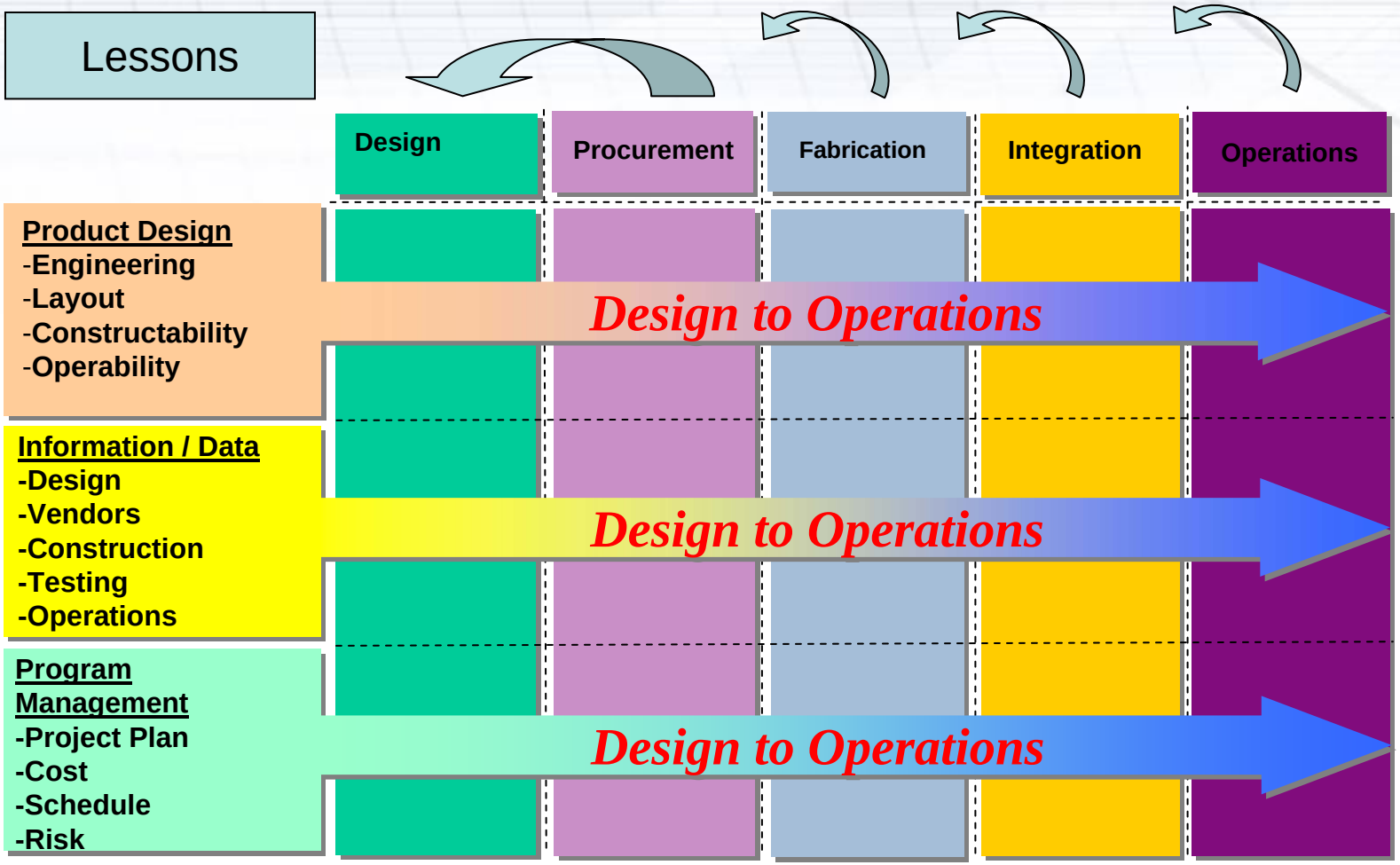
Oil & Gas are complex projects.

They use thorough integration processes.

Wind projects are less complex but mistakes in integration are expensive due to high installation and rework costs.

Effective integration is essential, using appropriate systems.

End-2-End and Integration

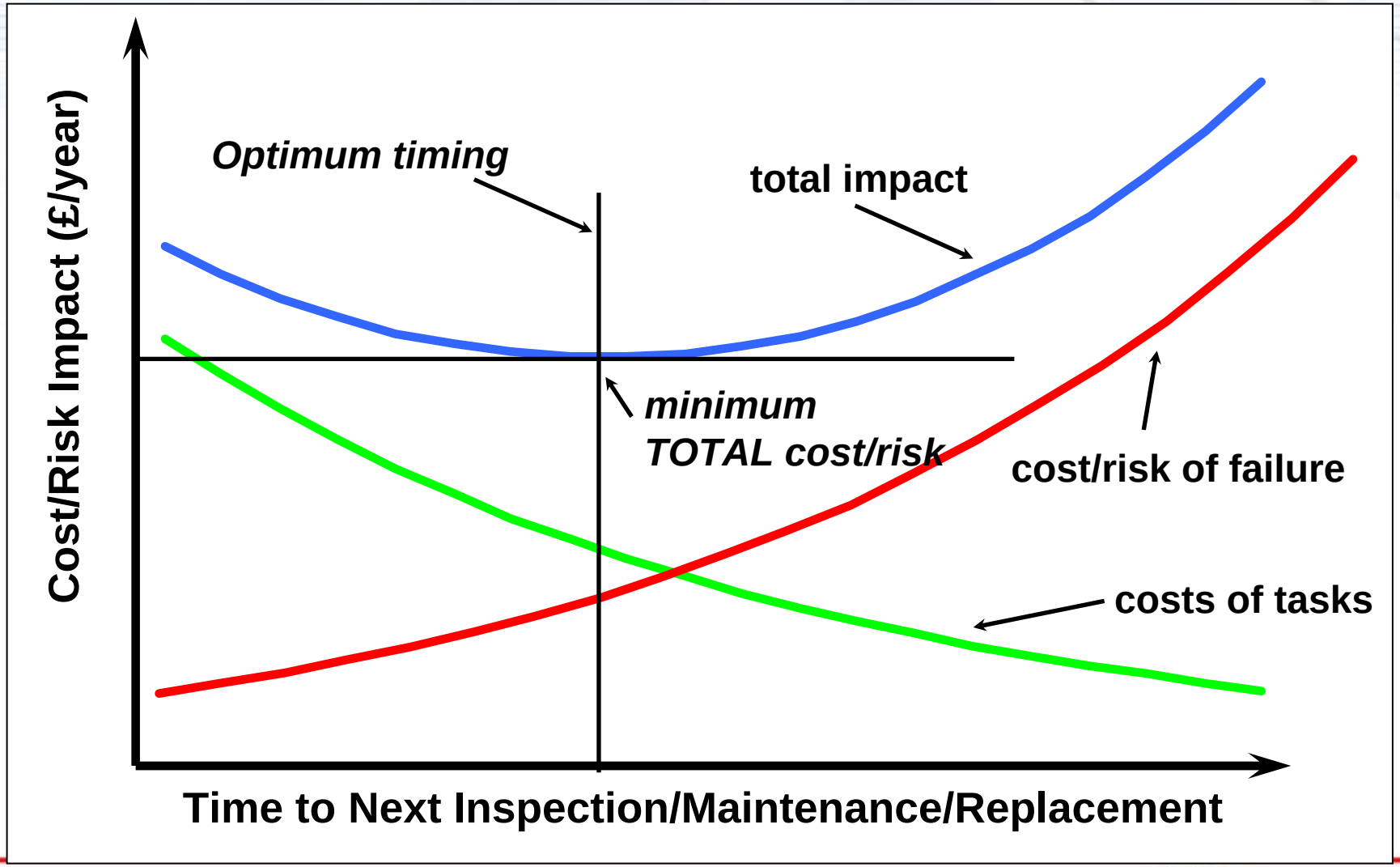


Synergy nr. 3. - Construction

3. Construction

- Maximise onshore fabrication
- Health & Safety management
- Environmental management

Synergy nr. 4 Reliability Centred Maintenance - The Challenge



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Synergy nr. 4 Reliability Centred Maintenance

- Used extensively by the oil & gas industry
- Particularly to increase performance of older fields
- A set of rules to establish least cost maintenance of a given design of field
- Can be used to enhance design of field to find lowest overall capex-opex solution and performance.
- Examples in wind could be:
  - > Inspection and maintenance frequencies for offshore electrical components.
  - > Ditto structural components.
  - > Provision of cross-connections of inter-array cables.

Synergy nr. 5 – Forms of contract

- Oil & Gas has evolved in response to:

  > Changing revenue streams

  > Major events (e.g. Piper Alpha)

  > Recognition of risk & who is best placed to manage it

South Arne. Denmark. 1997-99. One Contract EPC

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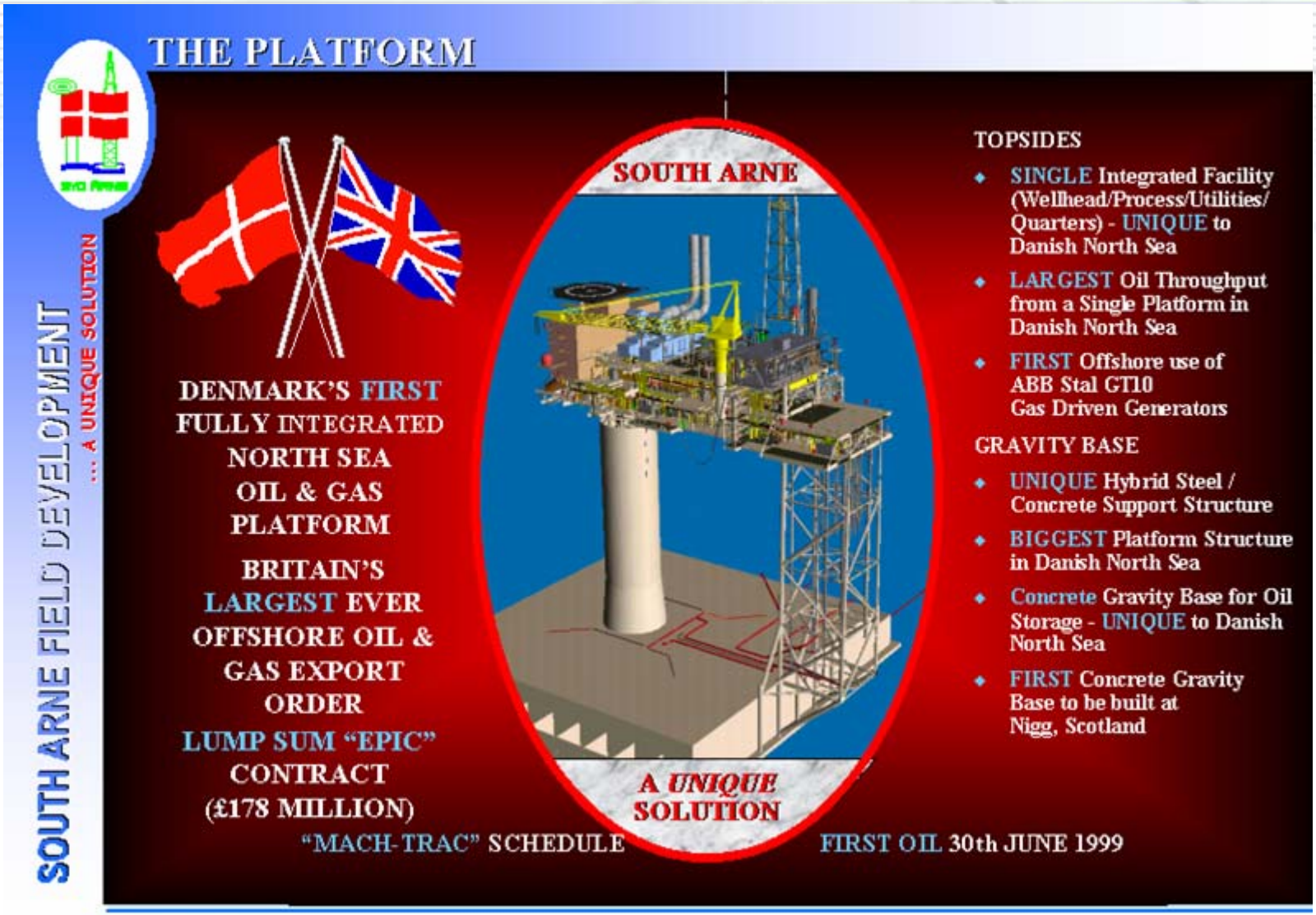
Landesamarbejde



South Arne, for the gravity base enthusiasts

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South Arne, for the big lift enthusiasts.

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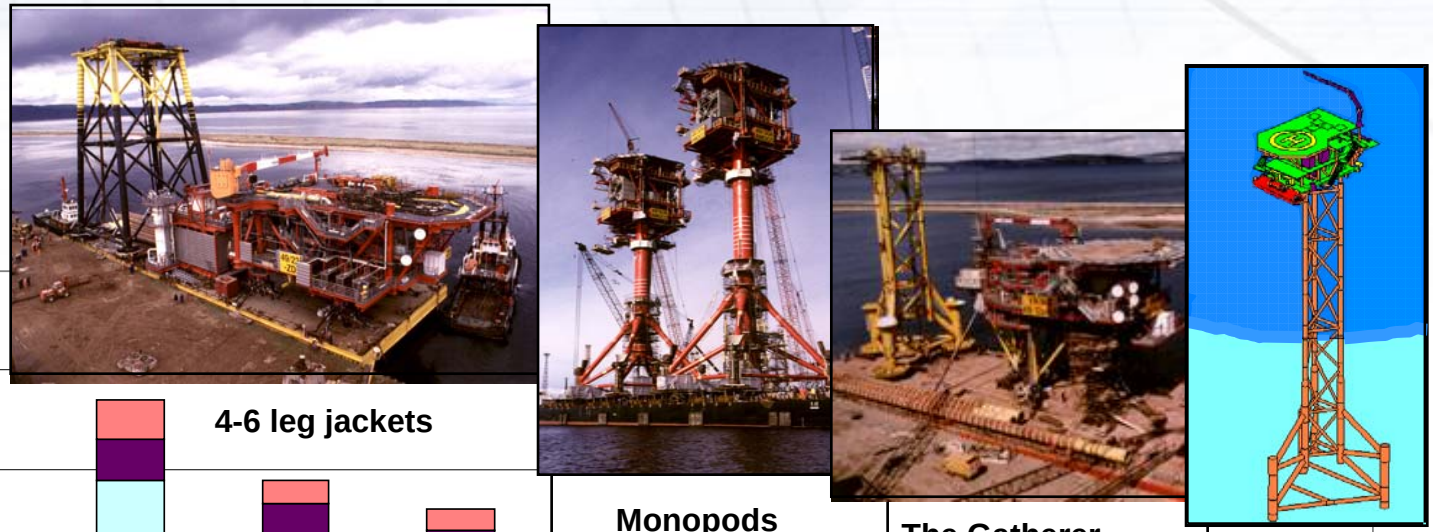
Offshore oil and gas and offshore wind

Reducing costs of minimum facilities installations



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Davy & Bessemer – North Sea.

- 1994/5. One Contract EPC.

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West Azeri – Caspian Sea – Ongoing. Multi-Contract.

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North Hoyle. Irish Sea. 2002/03.

- One Contract EPC (2 contractors).
- One Contract O&M (1 contractor).

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Scroby Sands. North Sea. 2003/04.
One Contract EPC. One Contract O&M.

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Kentish Flats. North Sea. 2004/05.
One Contract EPC. One Contract O&M.

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Barrow. Irish Sea. 2004/05.

- One Contract (2 contractors) EPC.
- One Contract (2 contractors) O&M.

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Synergy Nr. 5 – Which is the best form of contract?

- One size does not fit all!
- Some standardisation of contracts will help.
- Only use EPC if you have good definition.
- Only use multi-contracts if the Client uses an incentivised integrator/project manager.
- Only use an Alliance if everyone fully supports it.

Synergy nr. 6 - Alliances

- Started in UK North Sea in the mid-1990's.
- Same time as the CRINE initiative.
- Some clients offshore still use it.
- Open book, target cost approach.
- Sharing of risk & reward.
- Requires top-down commitment.
- Requires similar cultures and trust.

Andrew Project – North Sea. 1994-98

- First North Sea project alliance.
- 23% Saving against target Capex.
- 6 Months ahead of schedule.

Alliance Contractual Arrangements

Works Contract

• A contract that defines each company's scope of work.

Alliance Agreement

• An agreement which defines the principles, the overall scope of work for the entire Alliance, the change process as well as the Target Cost and the Risk and Reward scheme.

Synergy nr. 7 – Front end engineering

- Offshore needs as much certainty as possible to get best prices.
- All oil & gas projects undertake front end engineering.
- Offshore wind does limited engineering before tendering.
- Room for improvement!

Conclusion

Similarity + Value = Synergy

Onshore Wind + Better Definition

Offshore Oil & Gas + Better Contracts

= Synergy