Subsea Expo – Assessing “The Domino Effect” through UKCS Pipeline Network Modelling

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Assessing ‘The Domino Effect’ through UKCS Pipeline Network Modelling

- What is the Domino Effect?
- Pipeline network modelling
- The Network
- Model Inputs & Outputs
- Interesting findings
- Future use
Despite significant cost reductions, nearly half of the UKCS Oil fields are likely to be operating at a loss in 2016 at prevailing prices. While this represents about a sixth of total oil production, these fields collectively provide a significant proportion of the infrastructure used to transport oil and gas ashore. Were a number of these fields to cease production, their interconnectivity would mean many more could become sub-commercial, known as the ‘domino effect’.

Oil & Gas UK Activity Survey 2016
Understanding The Domino Effect

Field A OPEX

Host OPEX

Pipeline OPEX

Terminal OPEX

Total Field OPEX

Variable OPEX

Fixed OPEX

Cost share Basis or Tariff Basis

Field C

Field B

Field A

$ / bbl or p/therm

% of total cost based on throughput

Field Revenue

Total Field OPEX

Field Revenue

Total Field OPEX

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Understanding The Domino Effect

As one field ceases production, knock on effect on immediate surrounding fields………

and potential effect on all fields in that have connectivity to the same system
The Domino Effect in Action

LOGGS system COP planned for end of 2018

Knock-on effect for Pickerill and Murdoch (CMS) systems – premature closure potential
Pipeline Network Modelling

• Why?
  - Need to understand longevity of export routes
  - Investors who may be purchasing fields
  - Any potential new field coming online
  - Operators understanding of when change to cost share may occur

• What purpose?
  • Infrastructure Code of Practice
    – valid for the next five years
  • Great uncertainty beyond this point
  • LR Network Model serves this longer term view and highlights where potential risks may exist
The Network

- 4 key networks
  - West of Shetland
  - Northern and Central NS
  - Southern North Sea
  - Irish Sea

- ~ 70 pipeline systems come onshore to UK
- ~ 320 fields currently in production

- Fields produce to oil and gas pipelines – both considered

- Various cross border connections also included
The Model Inputs

- Production Forecast
- Operating Costs
- Revenue vs Costs
- Oil & Gas Price
The Model Outputs

Key Sensitivities have been tested

- Oil Price
- Gas Price
- % reductions in OPEX
- With and without Developments
- Production rate variation

- Bar & Date reflect LR Base case
- Error band reflects sensitivity analysis
- Relatively narrow “cessation of production” band on outputs
Future Use

Field development planning
- Identifying capacity within pipelines
- Determining COP dates for major infrastructure
- Helping to choose which evacuation route is more robust in terms of future production
- Identifying clustering opportunities for small pool opportunities

Prolonging Critical Infrastructure
- Identifying critical infrastructure hubs
- Identifying which aspects of OPEX will help prolong production
- Rationalising infrastructure

Decommissioning
- Identifying decommissioning activity & spend
Questions?

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