Intelligent use of Intelligent Completions

22nd August 2017

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fostering and funding innovation
Agenda

• Why Intelligent Completions
• The technology
• Making a decision
It’s complicated

• Conventional approach
  • Perforate everything
  • Maybe perforate in sequence
Reservoirs are not uniform

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<th>Reservoir</th>
<th>Oil in place</th>
<th>Pressure</th>
<th>Permeability</th>
<th>Proximity of water</th>
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Reservoir understanding at the start of the field life
Conventional approach to well management

- Drill your well
- Run your production tubing
- Perforate all four reservoirs to maximise early production
  - And hence revenue
- Ad hoc data collection
- Deal with problems later
  - Try and shut off water production
  - Re-perforate if scale forms
There is uncertainty – and reservoirs are not uniform

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Reservoir understanding 5 years later
A more intelligent approach to well management

- Perforate all four reservoirs
- Run an intelligent completion
- Real time monitoring
- Manage the problems proactively
  - Prevent or defer water production
  - Re-perforate if scale forms
Reality is more complicated
Typical intelligent completion in a horizontal well

**Intelligent Completion**

- Hydraulic, tubing-retrievable, surface-controlled, subsurface safety valve
- Casing
- retrievable production packer
- Conductor with clamps and protection system
- Intelligent flow monitoring and control devices
- Liner
- Isolation packers
- Perforations
Typical intelligent completion components
Making the decision to run an intelligent completion

**Advantages**

- Better information about reservoir performance
- Greater recovery = greater profitability
  - Adjust well to maximise recovery
- Fewer production problems
  - Less water (can impede flow and can kill well)
  - Less scale (can block flow)

**Disadvantages**

- Higher initial cost
  - Often applied to more complex wells
- More moving parts
  - reliability to be considered – now largely addressed
- More sophisticated reservoir management
  - Real time decision making
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