Developments in DHSV technology for insert GWD applications

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Agenda

Insert Down hole Safety Valves

- Opening up new opportunities
- Possible configurations
- A Joint Industry Project
- Torus insert DHSV for GWD applications
- Current projects
- Future developments
- Q&A
Economics

Workover well
- install full scale artificial lift/water removal
- High Capex, low producer = Poor Economics

Thru Tubing (Retrofit) solution
- no workover requirement
- Lower Capex = Improved Economics
Opening up new opportunities

Wells with TRSCSSVs

• Insert string compromises the existing valve

DHSV unable to function
Opening up new opportunities

Capillary string
• Wells with a requirement for a DHSV.

Gas lift
• Insert gas lift GWD system with a DHSV.

Insert Plunger lift
• Take plunger to wellhead in well with DHSV.

Insert DHSV is an “enabling technology”
“Dual string” design
- Exists for capillary string applications
- Uses existing proven DHSV
- Injection via upper string or through TRSSV line
“Concentric string” design 1 - flapper

- Exists for coil tubing gas lift
- Uses single flapper for barrier
- Gas injection via central conduit
Possible configurations

“Concentric string” design 2 - sleeve

• Exists for capillary, CT gas lift, PCP applications
• Large flow area
• Valve independent of type of penetration
Joint Industry Project > Torus SV

JIP

- Set up via UK’s Industry Technology Facilitator (ITF)
- Major operator sponsorship
- 3.813” 5k insert valve, plus modules
- Currently at prototype test stage
Torus SV

Concept

- Standard module for production barrier
- Capillary string module
- PCP rotary seal module
- Plunger conduit
Torus Valve > design

Key design features

- Minimal pressure drop via independent CFD analysis
- 2 trip installation of central conduit
- Single trip versions currently being tested
- Standard pre-installation techniques
  - Lock open TRSCSSV
  - Communicate to TRSCSSV control line
Torus Valve > pressure drop

STREAMLINES THROUGH THE VENT SLEEVE FOR A FLOW RATE OF 4000 BPD
Torus Valve > pressure drop
Torus valve > test regime

API 14A test programme

- 2.313” insert valve
- Response times met
- Zero leakage when valve closed on all cycles
Torus valve > current projects

Current development projects

- Installation of PCPs offshore, 3.813” valve
- UKCS, insert scale injection system with DHSV, 5-1/2 tubing
- UKCS, capillary string, foam injection 3.813” valve
- Offshore Europe, Insert gas lift system
Future developments

Modules

- Electrical penetrator/disconnect for TTSEPs
- Fibre-optic penetrator/disconnect for insert DTS
- Electrical penetrator/disconnect for PT gauge

Valve designs

- Tubing mounted valve
- Ancillary tools
Any questions?

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