Field trial update of an innovative ES-PCP for GWD application
Zilift Magnet Drive family of systems are defined by:

- Slim line enabling through tubing deployment
- High performance Permanent Magnet Motors (PMM)
- Delivering speed and torque to the pump at source
- Enabling multiple deployment options

“Produce down to the last drop”

It’s about time...

Driving incremental production
Magnet Drive Applications

Heavy oil:
- Cold heavy oil, CHOPS
- Steam assist (CSS, SAGD)

Conventional oil:
- High solids or sand production

Gas well deliquification
- Shale, CBM, conventional
TorqueDrive™ Components

Permanent magnet motor:
- Optimal force density
- High efficiency
- High continuous torque output

Torque Converter:
- Passive speed to torque conversion
- No mechanical contact
- Inherent overload protection

Equalizer section:
- Multiple barrier systems
- Past horizontal orientation
Permanent Magnet Transmission
- Motor and pump operate at optimum speeds
Contactless operation
- Excellent efficiency
- Inherent over-torque protection
Scalable technology
- Multiple linked modules
- Larger diameters provide significantly more torque per module
TorqueDrive™ Inverted Arrangement

- Place the pump intake within the well for maximum draw down
- Prevent the motor being placed in a sand sump
- Minimized diameter by eliminating cables past pump
- Motor efficiency allows effective cooling at low fluid velocities
Zilift full systems supply and integration

- Bottom hole assemblies
- Downhole cabling
- Downhole monitoring
- Drive systems
- SCADA integration
- Remote monitoring
Coil or Jointed Tubing Flow Path

Deliquification
- Water through tubing, gas through annulus
TorqueDrive™ Field Trials

San Joaquin, California

- Heavy oil application with CSS
- Full horizontal placement
- Dog leg > 12deg/100ft

- Objectives:
  - Verify deployment methodologies
  - Performance verification
  - Controls integration
- A real world test!
TorqueDrive™ Field Trial Results

- Installation and commissioning achieved **right first time**
- No safety incidents / minimized heavy handling
- Stable system operation demonstrated
- Negligible mechanical wear / full splice integrity
- Pressure compensation in equalizer perfect
- Negligible motor temperature heat rise observed
TorqueDrive™ Field Trial Results

- 50 BFPD at 1.5 HP (4 amps)
- Turndown ratio of 20:1 demonstrated

Static wellhead seal eliminates leak path
Gas well deliquification

- 1.750” maximum housing diameter
- Designed for through 2 3/8” 4.6# tubing
- 30 BFPD from 10,000ft
- Wireline deployed / live well intervention
TorqueDrive™ Next Steps

Product realisation underway:
- Additional field trials secured
- Design for manufacture
- Production facility constructed
- Customer commitment secured for batch manufacture

Improved capability in development:
- Multiple drive modules
- Real time downhole monitoring