



39<sup>th</sup> Gas-Lift Workshop  
Houston, Texas, USA  
May 16 – 20, 2016

# Novel use of dual completion for gaslift deepening

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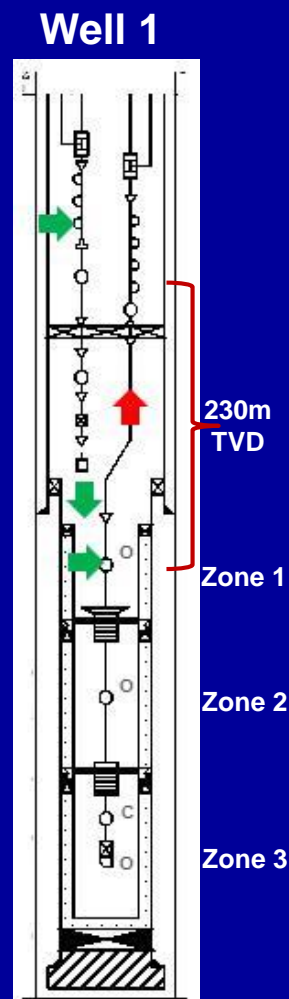
# AGENDA

- **Principle**
- **Field Implementation**
- **Results**
- **Benefits**
- **Challenges**

# PRINCIPLE

## Deepen gaslift to long string using short string.

- Zone 1/2/3 commingled in long string, short string is not used for production
- Current injection depth to long string is limited by top production packer
- Gaslift deepening achieved by injecting into short string to the SSD Zone 1 depth
- Slickline intervention to achieve the desired gaslift flow path (see schematic)



# FIELD IMPLEMENTATION (WELL 1)

## Candidate selection and well intervention:

- Assurance checks on well integrity
- Subsurface checks on offtake policy (offshore, WI field)
- Facility checks on production constraints
- Short string - Unplug, gaslift orifice in last SPM, dummy all other SPM
- Long string - Dummy all SPM (no unloading valves were required)
- Open up long string to production
- Perform FGS. Measure THP on short string
- Calibrate model and update well estimate (no well test available)

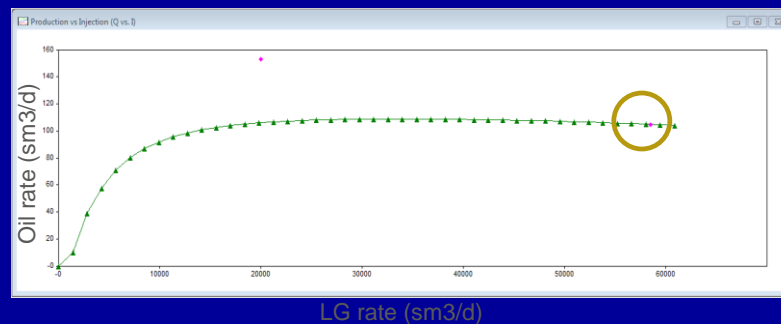
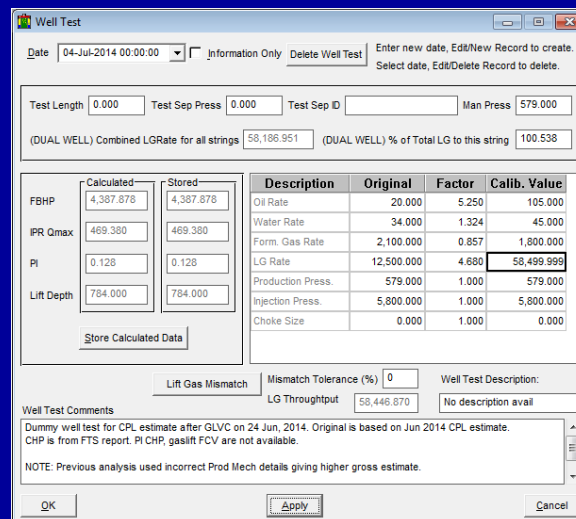
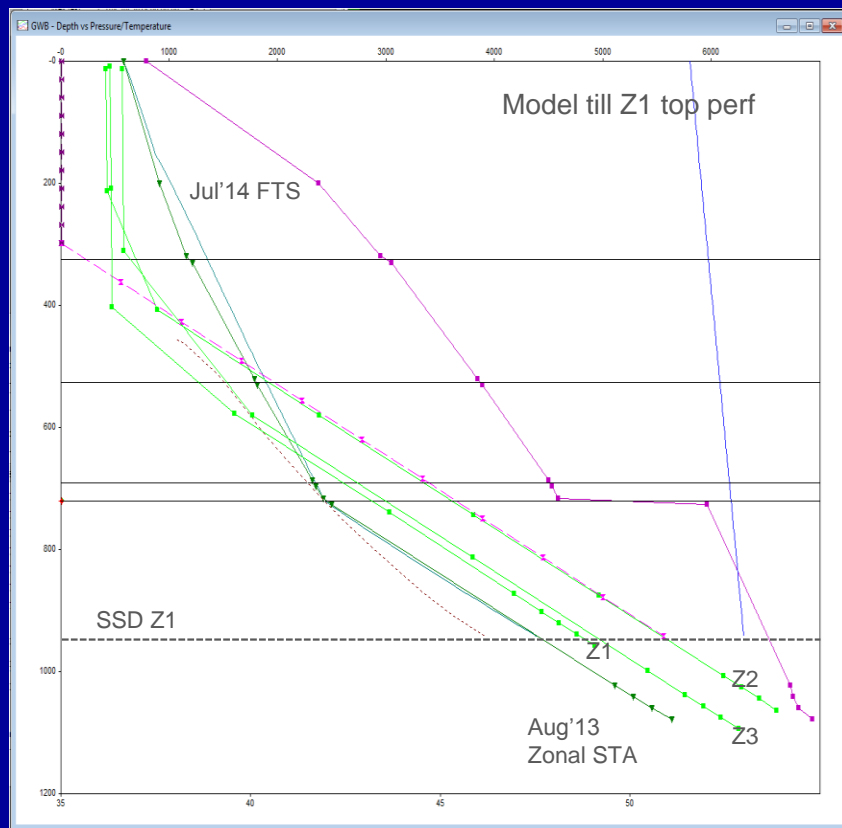
# RESULTS

## Stable well performance observed.

- **FGS run immediately after GLVC calibrated to rates higher than expected (flush production)**
- **THP on short string (after well stable) consistent with model indicating drawdown (oil rate) increased by 40%**
- **Nearby well (<200m) on Zone 2/3 showed interference with Well 1**
- **Well Tracer done (after 6 months) confirmed injection from SSD**
- **Well test done (after 9 months) confirmed modelled production rates**

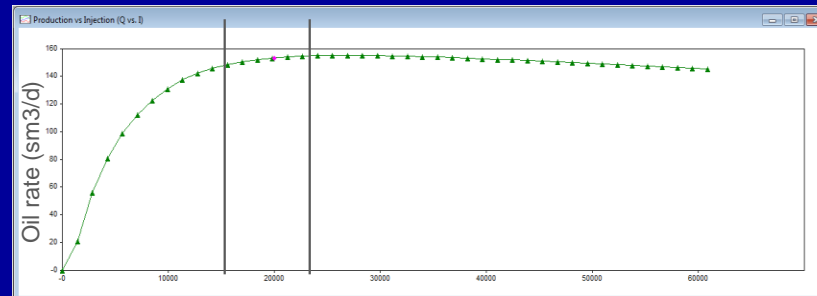
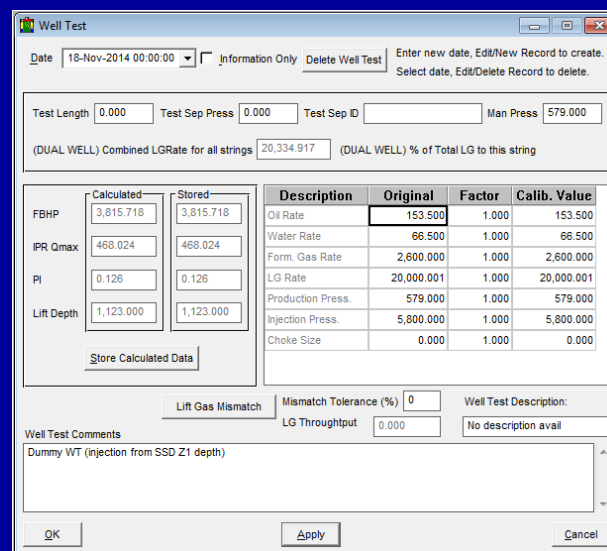
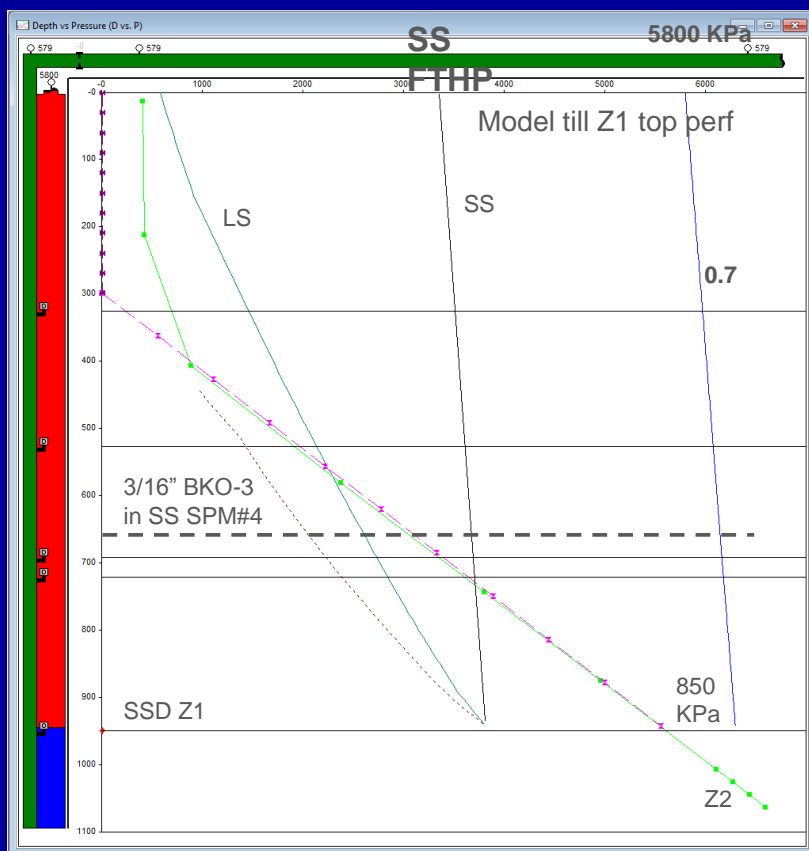
# RESULTS – WELL PERFORMANCE (Before)

- Oil rate 105 m<sup>3</sup>/d @30% WC. Measured drawdown ~12bar.
- Over-injecting gaslift (30 km<sup>3</sup>/d) due to 20/64” orifice installed.



# RESULTS – WELL PERFORMANCE (After)

- Oil rate 150 m<sup>3</sup>/d @30% WC. Measured drawdown ~17bar.
- TGLR ~170 m<sup>3</sup>/m<sup>3</sup> giving maximum production.



# BENEFITS

## Simple and cost effective method to increase oil production.

- Acceleration of reserves
- Implemented on slickline
- Access to the reservoir is retained (unlike in retrofit gaslift deepening system)
- FTHP on short string acts as virtual FBHP gauge
- Chemicals (eg: foamers) can potentially be deployed



# CHALLENGES

## Field specific challenges:

- No well tests since 2010 due to issues on test header valve
- Multiple wireline runs required to change out valves as per desired configuration
- Slickline HUD at 2 7/8" x 2 3/8" swedge (above SSD Z1) due to high flow velocity
- Risk of fish in long string → significant production loss
- Risk of fish in short string → lost opportunity

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