Field Trial of Triple Deck Shakers

Heath Lynch
Gerard Simon

Drilling Engineering Association
3rd Quarter Meeting
September 28, 2010
Lost Circulation Material Retention (LCMR)

- Triple deck shakers have been introduced that can be used for increased flow rates or LCMR, also known as in parallel or series.

- Ideally the screens will be chosen so that the top deck captures the larger drill cuttings, but allows the desired size of LCM to pass through to the middle screen.

- Fines that pass through the middle screen may be caught on the bottom deck and removed from the system.

- The selection of top and middle screens impacts not only the LCM recovery efficiency, but the buildup of drilled solids in the active system.
LCMR cont’d

- There is no clear guidance on the best screen sizes for LCMR, though selecting the top screen to permit the D90 of the LCM to pass through and a middle screen to catch the D10 of the LCM has been suggested.

- It is worth noting that even a perfect LCMR system will not eliminate the need to continue adding product.

- Hole product consumption and product degradation will need to be replaced to maintain the proper concentration and PSD.
Commercial LCM PSD Comparisons
Chevron H&P 227 Field Trial Service Partners

Brandt NOV – Multisizer

M-I SWACO – MD3

Derrick Equipment – HyperPool 5 panel
Brandt VSM MultiSizer

Dimensions (L x W x H)
- 104” x 74” x 68”

Weir Height
- 48”

Weight
- 5,383 lb

Deck Area – 3 Decks
- 73.08 ft²

Anticipated G-force
- 5.3 – 7.3 G
M-I SWACO MD-3

Dimensions (L x W x H)
- 101.7” x 77.4” x 67.7”

Weir Height
- 45.5”

Weight
- 6,450 lb

Deck Area – 3 Decks
- 76.2 ft²

Anticipated G-force
- 6.3 – 7.2 G
Derrick Equipment HyperPool 5 panel

Dimensions (L x W x H)
- 143.5 in x 63.5 in x 67.5 in

Weir Height
- 41.5”

Weight
- 4,394 lb

Deck Area – Single Deck
- 32.4 ft²

Anticipated G-Force
- 9 – 10 G
South Texas Field Trial – H&P 227

- Rig Shakers - 3 Brandt King Cobras
- Replace Rig Shaker #1
- “T” Flowline add Knife gate valve to Feed MultiSizer
Rig up and Operational Lessons Learned

- Rig up issues
- Flow line setup
- Plugging issues
Field Trial Well #1 H&P 227

- Start June 12, 2010
- 100% of flow for each well section over MultiSizer
- Surface
  - 10 mesh / API 60
- Intermediate
  - 10 mesh / API 120
- Production
  - 10 mesh / API 140
- 12 ¼” Surface - ~ 1,000’
  - 850 gpm,
  - ROP 200 ft/hr
  - WBM - ~9 lb /gal
- 8 ¾” Inter. - ~ 5,000’
  - 650 gpm
  - ROP 75 – 150 ft/hr
  - OBM - ~ 10 -10.5 lb/gal
- 6 ½” Prod. - ~ 3,000’
  - 450 gpm
  - ROP 20 – 100 ft/hr
  - OBM - ~ 12 lb/gal
Field Trial Well #2 H&P 227

- Surface 12 ¼”
- 200 ft/hr ROP
- WBM ~ 9 lb/gal
- 850 gpm
- 100% of flow over MultiSizer
- Screens
  - Scalper 10 mesh
  - Primary 1 & 2 API - 140
Field Trial Well #2 H&P 227

- MultiSizer handled 100% flow
- 8 ¾” Intermediate Hole
- ROP > 350ft/hr
- Flow Rate = 760 GPM
- OBM – ~10 lb/gal

- Screens
  - Scalper 10 mesh
  - Primary 1&2 – API 140, 170, 200
Observations

- One MultiSizer (up to API 200) screened finer than two rig shakers (API 80)
- Smart G performed well especially during sweeps

Screen wear

- No screens replaced
- Screen cell wear - Minimal
Scalping deck lab analysis

- SG 1.12 – 1.30 (API 10)

No major barite stripping identified from lab analysis

- SG 2.23 – 2.61 (API 140)
- SG 2.58 – 2.97 (API 170)
- SG 2.40 – 3.02 (API 200)