New Technologies Breakout Session

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Agenda

• Introductions
• Ground Rules
• Where are we now?
• Where will we be?
• How do we get there?
• Summary
Introductions

• Name
• Company
• Primary job role
• Artificial lift expertise/interests
• *Expectation of the session?
Introductions

• Emee Ermel
• Chevron Energy Technology Co.
• Petroleum engineer on the Artificial Lift & Production Modeling Team
  – Support Business Units with technical service and R&D projects
  – Deliquification focus area is one of my key responsibilities
• Areas of interest for AL are ESPs, gas lift, cap strings, and plungers
• My expectations for this session are to gain a better understanding of what the industry’s perspective is on technology…I want to learn about what new ideas are in store for the future.
Ground Rules

• No rank in the room
• Turn off cell phones or put them on vibrate
• Let one person speak at a time
• Use the microphones so everyone can hear
• Think outside the box
• This is our opportunity to collaborate and discuss in an open setting – please speak up!
Overview

• Where are we now?
  – Onshore, offshore
  – Training
  – Software
  – Lift methods

• Where will we be in the future?
  – 5, 10, 20 year outlook
    • Onshore, offshore
    • Training
    • Software
    • Lift methods

• How do we get there?
  – Outside our industry
  – Mature technology used in new applications
  – How do we transfer knowledge (competency development)
  – Industry relationships (operators, service companies, universities, etc)
Where are we now?

- What are the major AL methods for deliquification?
  - Plungers ~ 60 yrs
  - Rod pumps ~ 100 yrs
  - Cap strings ~ 10 yrs
  - Etc

- Are the current AL methods working for deliquifying wells?
  - Onshore/Offshore?
  - Low volume, high volume?

- Do we focus more on optimizing existing technologies or developing new technologies?

- What about software and/or modeling aspects?
  - Plunger lift modeling
  - Is there software that models foam lift?

- Can we predict when a well will load?

- Can we design for the right AL application?

- Where do we stand on training?
Where will we be in the future?
How do we get there?

• Where do we see ourselves in 5, 10 and 20 years?
  – Will we still be handling the water? Or will the industry have found a solution to avoiding water production?
  – What about AL technologies?
• What types of resources will we be producing from?
  – Coal bed methane
  – Deepwater
  – Oil shale sands
  – Transition zones
• How will we produce those resources?
  – Nanotechnology
  – Casing plungers
  – Etc
• Will we be focusing more on preventing liquid loading or finding other methods to handle the water?
• Will we be using mature technology w/o much focus on finding other solutions?
• Will we be trained? What will the workforce experience look like? Will operators be dependent on external expertise?
• Will we not have subject matter experts b/c everything will be automated?
• What type of data do we need? How will we get it?
Summary of Discussion

- Approximately 20-25 attendees from the following companies:
  - Chevron
  - BP
  - Unico
  - Weatherford
  - Corac
  - ILI
  - Quinn Pumps
  - Shell
  - Schlumberger
  - Caledyne
  - Encana
  - PEMEX
  - Petrotechnologies
  - Pentagon Optimization Services
Summary of Discussion

• Where are we now?
  – Using proven technology
  – Not much focus on candidate selection of wells for different AL types
  – Limited modeling of AL types
  – Gap exists between developers of new technology and end users
  – Tendency towards working independently on trying new technologies
Summary of Discussion

• Where will we be in the future?
  – Focus will still be on handling/producing the water
  – Mature technologies (i.e. plungers, rod pumps, etc) still being used
  – Controllers will be used in conjunction with AL applications
  – Focus on smaller, cheaper, reliable new technologies
  – More offshore applications
  – Optimized AL through effective monitoring
Summary of Discussion

• How do we get there?
  – Better R&D collaboration between inventors and end-users – “get technology out to the market”
  – Create effective funding models to encourage new technology development and deployment
  – Create “smarter” AL applications
  – Insist on downhole sensors, monitoring, and surveillance
  – Training training training
  – Communication communication communication
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