Development of Global approach to Gas Lift Surveillance and Optimization

Rodney Bane, Mike Johnson, Arthur Vargas and Sampson LeJeune
ExxonMobil Production Company - Global Artificial Lift Group
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Abstract

Objective: Outline the organization, plans and results of the Global Artificial Lift group formed at ExxonMobil to focus key resources on evaluation and optimization of artificial lift systems. Exxonmobil operates over 10,000 artificial lift wells globally and the largest segment of production from artificial lift comes from approximately 1000 gas lifted wells.

This presentation will describe how this new group has been designed and implemented to focus on artificial lift globally and more specifically on gas lift operations in particular. The presentation will describe the role of rotating technicians and the tools they use to evaluate and optimize gas lift wells.
Another chapter in Optimization at ExxonMobil

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ExxonMobil - Global Gas Lift statistics (2009)

Producing oil wells = ~ 10,000
Production = ~ 6.5 MBFPD
(2.8 MBOPD)

- Artificial Lift wells = ~ 9000
- Gas Lift wells = 1011
- Production from Gas Lift wells = 2.1 MBFPD (~ .8 MBOPD)
- Key gas lift areas = US, South East Asia, Canada, West Africa, Australia and North Sea
  - These numbers do not include XTO or Iraq.
  - Anticipate significant increases in number of gas lift wells and production in Russia, Canada, West Africa and Middle East over the next few years.

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Background - US Gas Lift Optimization results

2008 - 371 gas lift wells
- 3 Gas Lift Techs
- Evaluated 83 wells and optimized 37 wells
- Average build-up per well ~ 46 BOPD
- Total build-up ~ 2.5 % of gas lift production

2009 - 343 gas lift wells
- 4 Gas Lift Techs
- Evaluated 87 wells and optimized 48 wells
- Average build-up per well ~ 62.5 BOPD
- Total build-up ~ 5 % of gas lift production

2010 - 5 Gas Lift Techs
- Evaluated 119 wells and optimized 44 wells
- Average build-up per well ~ 80 BOPD
- Total build-up ~ 7% of gas lift production
ExxonMobil - Global Artificial Lift Group

Authors

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Gas Lift Technician Deployment Process and Tools

- Prior to deployment the Global Artificial Lift group works with local Subsurface Engineering team to review wells and prioritize evaluation candidates.
- Coordinate pre-deployment training and safety orientation with local Operations personnel.
- Typical deployment is for a 28/28 rotation but flexible on scheduling.
- Key Tools:
  - Echometer - Determine fluid levels, identify holes and determine injection point.
  - Digital thermal monitor - Determine efficiency of test facilities.
  - Clamp-on flowmeter - Estimate and/or verify gas injection rates.
  - WellTracer™ - Determine injection point(s), communication and efficiency.
Gas Lift Optimization Techniques and Focus

- Focus on immediate volumes impact while identifying wells for additional diagnostics (i.e., FPTs, WellTracer™, etc.) and further evaluation (e.g., ESP candidate screening, valve redesign, installation of packoff, tubing change out, etc.)
- First priority are wells that Operations identify as ‘problem wells’.
- Identify potential safety, gas lift measurement and control improvements.
- Review unloading and operation procedures and processes.
- Dedicate time to OJT and formal training of operators.
- Pay special attention to shut in and dual gas lift wells
  - Typically these receive less attention and have greater potential uplift
Early Results

SE Asia - Offshore Gas Lift Optimization

- Evaluated 29 wells and made 12 optimization recommendations
- Buildup from recommendations completed ~ 24%
- Total build-up realized ~ 1.2 % of gas lift production evaluated
- Identified ~ 600 BOPD buildup potential
- Identified potential improvements to surface control and measurement
Early Results

Europe - Onshore Gas Well deliquification candidate evaluation
- Evaluated 59 wells
- Identified ~ 8 MMSCFD build-up potential
- Identified significant cost reduction potential using Best Practices

North America - Onshore Gas Lift and Rod Pump Optimization
- Evaluated 23 gas lift wells
- Optimized 9 gas lift wells yielding ~ 4% total field build-up
- Provided needed gas lift operator training

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Key Observations

- Rotating Technicians offer a greater opportunity to share technology and best practices.
- Many of the benefits and improvements identified were not anticipated during pre-deployment discussions.
- Deployment is more complex than anticipated (i.e., equipment delivery and Customs, equipment compatibility, training, etc.).
- Best results appear to come from locations where operators can work closely with the Gas Lift Technicians during deployment.
- Build-up opportunities are significant even in areas with experienced operators and developed processes.
- Follow-up and maintenance of build-up is a challenge.
- During the first year this group will ‘touch’ less than 10% of ExxonMobil gas lift wells around the world.
Next Steps

• Plan deployments or assignments to all units with gas lift wells.
• Return to units for follow-up on recommendations and to identify new potential.
• Work to streamline travel and equipment delivery.
• Continue to expand use of tools and develop expertise in evaluating gas lift under a broad range of conditions.
• Focus on developing local expertise to maintain buildup and expand optimization results.
• Utilize learnings to develop remote and/or automated surveillance processes and tools.
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