Guidelines & Recommended Practices
Selection of Artificial Lift Systems For Deliquifying Gas Wells

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Developed by a Consortium of Plunger Operators and Service Companies
Participants

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Production and Artificial Lift
Service to the Petroleum Industry

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Goals

- To build recommended practices document for the evaluation, installation, operation and optimization of Plunger Wells.
- To provide a mixed consortium of service providers and producers practices to build a consensus.
Where the document will reside?

- Or go to www.alrdc.com then under hotlinks Artificial Lift Selection for Gas Wells then to Artificial Lift Selection and down to 2.4e Tubing Plungers and select Section 2.4e Tubing Plungers
What is in the document?

- Introduction
- Practical Limits
  - Maintenance
- Cost Guidelines
- Life Expectancy Guidelines
- Evaluation
- Installation
- Operation
- Maintenance
- Myths
- Definitions
I. Well Depth and Type

A. Depth

1. There are no practical depth limits for tubing plungers.
   The primary issues associated with depth include fall and rise times. Deepest known tubing plunger lift well is approximately 26,000 ft. Success is more dependent upon other factors, such as differential pressure (down-hole/surface), fluid rate and gas rate.

B. Horizontal

1. Consideration needs to be given to the distance between the ECT and where the bumper spring is landed. When plunger lift downhole components are set at deviation greater than 60° – 65°, the ability to retrieve or set is limited by wireline capabilities.

2. The effectiveness of a standing valve in a horizontal well may also be questionable. For landing a standing valve at high deviation, a specialized standing valve may be required.

3. When the dogleg severity exceeds 3° per 100 ft of depth, the length and type of the plunger needs to be considered. The more severe the dogleg, the shorter the plunger.

C. S-shaped

1. Historical data has shown that plungers can be run as long as the deviation is not greater than 20° – 35°. While tubing plungers have been used successfully in wells with even higher deviations, the issue is plunger fall.

2. Success is also dependent upon plunger style.

D. Packer/Slim Hole Completions

1. If a packer is present, the system requires a higher GLR to cycle a plunger to surface. Typically, the GLR needs to double for a conventional system operation.

2. Continuous flow plungers are applicable if the necessary gas velocity is available.
Introduction and Practical Limits, Cost Guidelines and Life Expectancy

• Gives a background to plunger lift
• Discusses the limitations in regards to production rates, pressure, and depths
• Provides some rough cost guidelines and life expectancy of equipment.
Evaluation, Installation, Operation Maintenance

- Provides guidelines to evaluating candidates
- Slickline and surface installation guidelines
- Example Maintenance documents and guidelines to frequency.
Examples of Forms for Maintenance
Conventional/Continuous Flow

- Provides a basic strategy for determining the type of plunger candidate the well is.
- Continuous Flow plunger applications guidelines are provided.
- Conventional Plunger guidelines are introduced including Minimum on/Minimum Off well descriptions and means for optimization.
Guidelines for Depletion
Examples of Minimum On
Example Minimum Off Well
Myths/Definitions

- This section was used for a commentary on common myths in plunger lift
- A definitions section was added as a reference for the terms used throughout the document
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