Gas Lift Handbook

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Introduction

This document has been developed based upon the content of the API Gas Lift Book 6 of the Vocational Training Series, Third Edition, 1994. The third edition was based upon evolutionary information which was initiated with the first edition dated 1965.

Gas lift systems provide a means of enhancing the natural production of hydrocarbons from a producing oil or gas well. Gas lift is widely used because of its broad spectrum of capabilities to increase the production volumes. This handbook has been assembled to provide the reader with a fundamental knowledge of the general aspects required within a gas lift system. This information has been provided by industry experts and contains many technical perspectives and approaches. The 19 sections of this handbook contain the tutorial information and data that has been compiled from numerous API specifications and recommended practices. While this handbook includes foundational data, good engineering judgment and local work practices are essential to supplement this information.

Due to the historical nature of the source documents, the terminology, abbreviations, and symbols have been merged and harmonized. Section 3 includes the definitions and symbols utilized within this recommended practice.

Section 4 provides an introduction to the basic principles of gas lift. The subject areas include artificial lift systems basics, gas lift system types, and the major components of a gas lift system. The advantages and limitations of gas lift are provided to aid the selection of an appropriate lift method. A brief review of gas lift system development provides a historical perspective on the method.

Subsequent sections of this handbook provide the following: fundamentals of well performance, multiphase flow prediction, gas fundamentals and facilities, gas lift mandrels, relevant tools, valves, system design, continuous, intermittent, dual well flow design methods and analyses and troubleshooting of gas lift wells.

Gas Lift Handbook

1 Scope

This document presents information on the following topics related to gas lift equipment:

a) the basic principles of gas lift;

b) gas lift equipment selection;

c) how various types of gas lift equipment work;

d) how a gas lift system should be designed.

Information is also included on monitoring, adjusting, regulating, and trouble-shooting gas lift equipment. It is intended to familiarize operating personnel with the use of gas lift as an artificial lift system.

2 Normative References

No other document is required for the application of this standard. A list of documents associated with API 19GLHB are included in the Bibliography.

3 Terms, Definitions, Abbreviations, and Symbols

3.1 Terms and Definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1
acceptance
Agreement or acknowledgment that the component or assembly can be used without restriction.

3.1.2
annulus
Concentric space that exists between the tubing and the production casing of the well.

3.1.3
API oil gravity
Specific gravity of a liquid as defined by using API methodology.

3.1.4
asphaltenes
Heavy fraction of crude oil consisting of aromatic and naphthenic compounds that often adhere to wetted components during production and that are not soluble in straight-chain solvents.

3.1.5
black oil correlation
Mathematical equations describing crude oil properties at a range of conditions defined by laboratory evaluations of reservoir oils as distinguished from compositional models for light hydrocarbons.

3.1.6
bubble point pressure
The pressure (at a given temperature) where the first bubble of vapor is formed when pressure is reduced in a liquid.