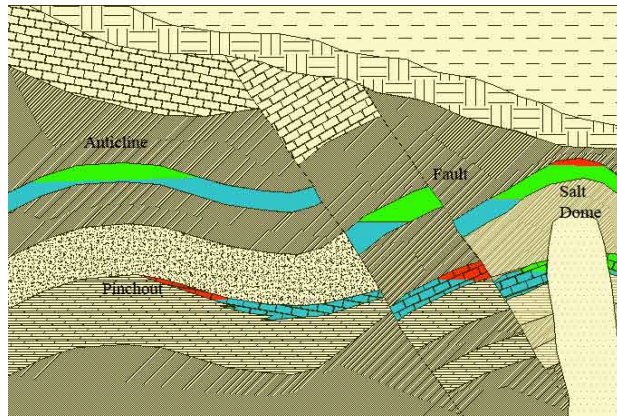


Gas Operations Engineering

5-Day Course

This course is designed for technical professionals with field development and operations responsibilities. The course begins with a discussion of reservoir basics leading from the definitions of key reservoir concepts (from a surface facilities perspective) to a brief discussion of conventional gas reservoirs to a somewhat more detailed discussion of Coalbed Methane (CBM) and Shale Gas with emphasis on the facilities that are required to maximize recovery.



This is followed by a full day devoted to the tools that can enhance the effectiveness of a field engineer. This section is heavy with practical discussions of engineering calculations, hands-on exercises, and the underlying assumptions behind the equations that are broadly used in Oil & Gas. This section ends with a discussion of evaporation, hydrates, dehydration, and corrosion.

The remainder of the course covers the issues that arise from the requirements to operate unconventional gas wells at historically low pressures, including facilities-planning requirements, the increased importance of evaporation/condensation at low pressures, gas well deliquification, gas compression, well site facilities, gas gathering issues, produced water, and plant operations overview.

The course is intended to provide necessary tools for facilities and production engineers with ties to the field. It emphasizes facilities issues that can arise after the gas leaves the coal-face/shale-face. It does not provide any substantial information on drilling, drilling prospect selection, log analysis, hydraulic fracturing, or reservoir modeling.

The examples in the course focus primarily on U.S.A. operations because these operations are significantly more mature than Unconventional Gas operations in other parts of the world, and a more complete life-cycle analysis can be provided from that perspective.

Oil & Gas regulations, including environmental regulations, are very complex and vary widely from jurisdiction to jurisdiction. A comprehensive review of these regulations is beyond the scope of any five-day course, so the limited discussion of regulations in this course is presented from a San Juan County, New Mexico, U.S.A. point



of view as an example of the restrictions that can be placed on operations in a mature basin—this class is not intended as a Law-Review Class and regulations are only presented to illustrate the range of issues that can arise.

Attendees of this course will be expected to take a pre-course examination to assess the level at which the class should be taught and a post-course examination to assess its effectiveness.

A complete set of course materials and lunches are included.

Outline

- I. Reservoir basics
 - a. Reservoir concepts
 - b. Conventional gas
 - c. Tight gas
 - d. CBM
 - e. Shale gas
- II. Field Engineering tools and concepts
- III. Wellbore deliquification
- IV. Compression
- V. Field Facilities—Well sites
- VI. Field Facilities—Gathering
- VII. Produced water
- VIII. Interface to plants
- IX. Integration of concepts

Instructor Bio:

Mr. David Simpson has 31 years experience in Oil & Gas and is currently the Proprietor and Principal Engineer of MuleShoe Engineering. Based in the San Juan Basin of Northern New Mexico, MuleShoe Engineering addresses issues in Coalbed Methane, Low Pressure Operations, Gas Compression, Gas Measurement, Field Construction, Gas Well Deliquification, and Produced Water Management. Prior to forming MuleShoe Engineering, David was a Facilities Engineer for Amoco and BP for 23 years. A Professional Engineer with his Masters degree, he has had numerous articles published in professional journals, has contributed a chapter on CBM to the 2nd Edition of Gas Well Deliquification, by Dr. James Lea, et al. He is a regular contributor to various conferences on Deliquification, CBM, and Low Pressure Operations. He holds a BSIM from University of Arkansas and an MSME from University of Colorado.

