PRODUCTION GEOLOGY WORKSHOP GEO003

COURSE DESCRIPTION

Geological factors bear directly on and usually control engineering activities such as drilling, logging, testing, completion, development, and production, as well as all financial decisions associated with development. This Course assumes the participant has some understanding of elementary geology, but it will provide a review of key geological principles and environments of deposition, all keyed to focus on the practical impact of geological models and uncertainty on appraisal and development. Without a common understanding between geologists and engineers, there can be no real interdisciplinary communication or teamwork in reservoir development and production activities. Engineering, financial, and geological coordination and understanding are the objectives of this course.

COURSE OBJECTIVES

By the end of this course, participant will be able to:

- Understand the sources of geological data and the interpretation of that data, including maps, cross-sections, electric logs, and seismic sections
- Recognize the relationships between paleo-environmental interpretations and the practical application of these interpretations to field development
- Recognize, and appreciate uncertainty in geological and geophysical data/interpretation
- Understand the uncertainty surrounding the geologist's interpretation.... "Why won't they give me a straight answer?"
- Recognize ways in which geological data is presented for evaluation in integrated asset teams
- Understand and more realistically evaluate geological data and interpretation
- Understand geological interpretation impact on production and development

WHO SHOULD ATTEND

Production, Completion/Reservoir Engineers, and Managers involved with reservoir management, and development/production, who might require an understanding of geological data, its variability, and the effects of the data, and its' interpretation, on their projects and jobs.

COURSE DURATION

5 Working Days

COURSE OUTLINES

1. Correlation and Stratigraphy
    - Understanding rock layer correlation and stratigraphic principles.
    - Interpreting stratigraphic sequences and their relevance to reservoir analysis.
    - Identifying key markers for mapping and well planning.
2. Structural Interpretation
    - Analyzing geological structures' influence on reservoir behavior.
    - Interpreting seismic data to identify subsurface features.
    - Understanding structures' impact on fluid migration.
3. Seismology
    - Exploring seismic data acquisition and processing.
    - Interpreting seismic sections for reservoir potential.
    - Using seismic attributes in reservoir characterization.
4. Clastic/Carbonate Deposition and Unconventional Reservoirs
    - Studying depositional processes in clastic and carbonate reservoirs.
    - Analyzing properties and challenges of unconventional reservoirs.
    - Understanding production potential in unconventional reservoirs.
5. Reservoir Geology
    - Examining rock types, diagenesis, and porosity/permeability variations.
    - Identifying geological controls on reservoir performance.
    - Integrating geological and engineering data for reservoir characterization.
6. Reservoir Characterization and Modeling
    - Techniques for characterizing reservoir properties through data analysis.
    - Constructing reservoir models for fluid flow simulation.
    - Incorporating uncertainty analysis in reservoir modeling.
7. Volumetrics
    - Estimating hydrocarbon volumes using geological and engineering data.
    - Assessing reservoir storage and recovery efficiency.
    - Understanding limitations and uncertainties in volumetric calculations.

8. Well Planning
    - Considering geological factors in well location and trajectory planning.
    - Optimizing well placement based on reservoir characteristics.
    - Evaluating drilling risks associated with geological formations.
9. Reservoir Appraisal
    - Evaluating reservoir potential through testing and data analysis.
    - Identifying uncertainties in geological and geophysical data.
    - Incorporating geological interpretations in decision-making.
10. Field Development
    - Applying geological knowledge to optimize field development strategies.
    - Integrating geological and engineering data for reservoir management.
    - Assessing the impact of geological uncertainties on economics.
11. Uncertainty Analysis
    - Understanding and quantifying uncertainties in data and interpretations.
    - Analyzing uncertainty's impact on reservoir predictions.
    - Applying risk analysis techniques in decision-making.