

**Code: G-SC-۱۲**

**Advanced Horizontal well fracturing**

**Instructor: Dr Ali Daneshy (Daneshy Int'l, USA)**

**Date: ۹۷/۱۱/۰۴ – ۹۷/۱۱/۰۶**

**Duration: ۳ days- (۲۴ hours)**

**Course Description:**

This is a new and expanded version of our most popular course. It presents a down-to-earth, easy to understand nuts and bolts of the various tools and techniques that are in use today for application of multiple fracturing for successfully producing extremely low permeability reservoirs.

Successful fracturing of a horizontal well requires deeper understanding of the relationship between reservoir and formation properties, in-situ stresses, well completion, and details of fracture design. Through numerous case histories and actual job results the course shows that many horizontal well fractures usually include a mix of axial (longitudinal) and transverse fractures along the length of the well. The cause of this behavior is traced back to completion techniques and fracture designs. The many case histories covered in this course include active US and Canadian tight reservoirs such as Bakken, Eagle Ford, Barnett, Cardium, Fayetteville, Granite Wash, Haynesville, Marcellus, Montney, Nordegg, Viking, and more. It presents the different fracturing strategies that are being used in different geologic formations, and the completion options that help their implementation. It also presents several new techniques for analysis of treatment data for continuous improvement of production results. The new additions to this course cover new and simple methods for determinations of in-situ fracture parameters, and, treatment data analysis with view towards job improvement.

Important engineering parameters for successful fracturing of horizontal wells include the length of the horizontal well, type of completion (un-cemented vs. cemented hole), selection of the specific completion system and its functional reliability during the entire fracturing operations, the number and spacing of the fractures, the type and volume of frac fluid, injection rate, and the type and concentration of proppant. This course offers an in-depth review of the different completion techniques presently used by the industry and the operational strengths and weaknesses of each of them.

This course is designed specifically for practicing engineers and geologists. It is suited for all interested in improving the outcome of hydraulic fracturing treatments in horizontal wells, including drilling, completion, reservoir and production engineers as well as geologists and geophysicists. Both technical and management staff will benefit from attending this course.

**Course Outline:**

- Mechanics of fracture initiation
- Mechanics of fracture extension (expanded)
- Fracturing options in un-cemented liner completions with case histories
- Fracturing options in cemented cased-hole completions with case histories
- Fracturing fluids and proppants
- Fracture mapping & diagnostic tool
- Novel methods for determination of In-situ fracture properties (growth pattern, orientation, length, conductivity, etc.) (new)
- Treatment analysis with view toward production Improvement (new)
- Summary and discussion