Formation Damage and Matrix Acidizing Fundamentals

MODULE

About the Skill Module

This skill module addresses the complex oilfield phenomena that studies and attempts to resolve production loss or less than expected production rate following initial completion or any well workover or intervention activity.

Formation damage is a term often used to describe the cause of production loss; its use is commonly misunderstood or misused as many factors and circumstances may be the cause of reduced rate. The set of circumstances referred to as “True” Formation Damage is described in detail; production loss caused by these circumstances may often be remediated as long as causes are properly defined and appropriate remedial steps are taken. Other causes of production shortfall, also grouped into the formation damage term to describe lost production, are identified in the module along with recommended remedial steps to address them. Use of the reservoir engineering term “skin” is explained and quantified in the module. Production loss remediation due to “True Formation Damage” using principles of matrix acidizing and surfactant chemistry are presented in detail. The complex reactions that take place using a Hydrofluoric acid / Hydrochloric acid on sandstones (referred to as “Mud Acid”) and the Hydrochloric acid reaction on limestones to remove production loss factors are explained. Fracture acidizing of limestones is explained and examples illustrated. Matrix acidizing operational considerations of corrosion inhibition, acid additive selection, iron control, acid diversion, and related important topics are addressed and explained. Several practical exercises are worked to illustrate key module principles.

Target Audience

Petroleum engineers, production operations staff, reservoir engineers, facilities staff, drilling and completion engineers, geologists, field supervisors and managers, field technicians, service company engineers and managers, and especially engineers starting a work assignment in production engineering and operations or other engineers seeking a well-rounded foundation in production engineering.

You Will Learn

Participants will learn how to:

- Illustrate the impact of formation damage upon production
- Explain the wide variety of reasons, sources, depositional environments, and routine operations’ activities that result in production limitations
- Assess formation damage “skin” values

- Calculate production rates with various levels of formation damage as well as no formation damage
- Describe how TFD is recognized and how PD is recognized and present the characteristics and elements of each
- Illustrate clay stabilization through the use of positively charged cation exchange to stabilize negatively charged clays to limit clay migration, hydration, and other damaging mechanisms

Skill Module Content:

- Defining Formation Damage
- Formation Damage Causes
- Quantifying Formation Damage
- “True Formation Damage” and “Pseudo Skin”
- Importance of Understanding Rock Mineralogy and Clay Stabilization
- Critical Role of Oilfield Surfactants
- Matrix Acidizing of Limestones and Sandstones
- Iron Control, Diverting Agents, Corrosion Control
- Acid Fracturing – Limestones Only

Product Details

Categories: Upstream

Disciplines: Production and Completions Engineering

Levels: Foundation

Product Type: Individual Skill Module

Format: On-Demand

Duration: 9.5 hours (approx.)

$795.00