

WATER TREATMENT AND INJECTION TECHNOLOGY

PRD027

COURSE DESCRIPTION

Water is a major component in Oil & Gas industry. It is addressed in many perspectives; starting from subsurface aquifer water characterization, water injection, water conformance techniques, water disposal reaching to scale deposition and corrosion control aspects.

In this course, participant will be provided with the knowledge of all key aspects of "Water Treatment and Injection" from subsurface elements to surface components. This will start with reservoir engineering point of view, rock and fluid properties, need of water injection & Waterflooding and new technology in this regard such as Smart Water Injection (e.g. BrightWater® and LoSal®).

They will also gain knowledge of the water treatment technology and injection pumps that are installed on the processing decks of these offshore platforms to send filtered and sterilized seawater into the reservoirs. The course will also address the operational surface aspects of the topic covering key topics such as water sources, water chemical and physical desired quality, scale build up (reasons, types and mitigations), corrosion issues (causes, treatment and management) and Souring which can occur when water containing oxygen and bacteria is injected and can reduce the produced hydrocarbons' value.

COURSE GOAL

To enhance the participants' knowledge, skills, and attitudes necessary to deal with different types of water treatment and water injection new technology.

COURSE OBJECTIVES

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

- Understand the fundamentals of water chemistry
- Understand Reservoir characteristics and rock properties
- Determine the need for water injection
- Understand the principles of produced water discharge/disposal and treatment
- Be familiar with water treatment microbiology
- Be familiar with corrosion controls
- Be familiar with produced water treating equipment
- Be familiar with water injection and disposal systems - theory of operation, corrosion, scale, and biological control
- Be familiar with the technology of injection water impurities and treatment
- Apply water quality monitoring and controls

- Be familiar with operation of the Water Injection system
- Learn more about the smart water injection new technology
- Learn how to identify and manage uncertainties and risks related to water treatment and its injection technology.

WHO SHOULD ATTEND

- Process Technicians
- Process Technologists
- Maintenance Personnel.
- Reservoir engineers
- Production engineers
- Production technologists
- Employees working with equipment and materials purchasing, equipment procurement, job planning as well as immediate supervisors to the working technicians.

COURSE DURATION

5 Working Days

COURSE OUTLINES

1. Introduction and Fundamentals

- Rock and fluid properties
- Reservoir types and Description
- Overview on the big cycle
- Water Injection vs. Waterflooding
- Components of Water Injection project
- Typical Waterflooding project
- Recovery costs and Economics

2. Water Flood

- Water chemistry fundamentals
- Water sampling and analysis
- Water formed scales
- Produced water treating equipment
- Theory of operation, advantages and disadvantages
- Environmental Impact

3. Waterflooding Mechanisms and Treatment

- Need for Water Injection
- Reservoir Characterization,
- Injection water impurities, treatment, and technology
- Water quality monitoring and control
- Performance forecasting
- Design aspects
- Injection and produced water management.
- Performance Forecasting

4. Operational Aspects of the Water Injection Technology

- Well design and construction
- Technology types, flow diagram and P&ID's
- Equipment, components, normal, and emergency operation
- Corrosion control
- Water treatment microbiology
- Produced water discharge/disposal and treatment principles
- Water injection and disposal systems - theory of operation, corrosion, scale, and biological control

5. New Technology and Case Studies

- Uncertainties and Risks associated
- Deep conformance techniques
- Smart Water Injection
- BrightWater®
- LoSal®
- Case Studies

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