



Heavy Oil Exploitation

Course Overview

The course covers the challenges in heavy-oil exploitation. The participant will be introduced to applications of various key technologies in the field. Participants will learn strategies to produce heavy-oil profitably. Current effort to upgrade heavy oil to light fuels and chemicals will also be highlighted.

Course Length

5 Days Course

Content:

Day 1

- Introduction
- Conventional oil & heavy oil
- The properties of heavy oil
- Heavy oil development worldwide
- Industry trends & challenges
- Geology of heavy oil
- Heavy oil phase behavior
- Heavy oil workflows

Day 2

- Recovery processes overview
- The primary recovery processes - Cold Heavy Oil Production with Sand (CHOPS)
- The non thermal recovery processes - Waterflood, Chemical Flood and Vapor Extraction (VAPEX)
 - Thermal recovery processes - Cyclic Steam Stimulation (CSS), Steam Flood, Steam Assisted Gravity Drainage (SAGD), Fire Flood/In Situ Combustion
 - Newly developed recovery processes - Toe to Heel Air Injection (THAI), THAI with solid catalyst (CAPRI), Steam Solvent Based Hybrid processes

Day 3

- Heavy oil production, completion overview
- Lifting methods - Gas Lift, Sucker Rod Pumps, Progressive Cavity Pumps (PCP) and Top Drive PCPs, Hydraulic Pumps, Electrical Submersible Pumps (ESP), High Temperature ESP (Red Hot Pumps).
 - Sand management strategy and sand control techniques
 - Introduction to Heavy Oil Process Schemes

Day 4

- Basic Heavy Oil Process Schemes
- Onshore and Offshore Heavy Oil Process Facilities
- Differences with Conventional Oil Facilities
- Introduction to Heavy to Light Oil (HTL) Upgrading Process
- Facilities Design and Operations for Heavy Oil Processing
- Separator Design Considerations and Operating Conditions
- Heating System Design Considerations and Operating Conditions
- Pumping System Design Considerations and Operating Conditions
- Instrumentation, Metering and Utilities System Design
- Emulsions Control and Treatment
- Emulsion Behaviors
- Treatment Options
- De-emulsifier Selection and Design



Day 5

- Heavy Oil Transportations and Storage Systems
- Heavy Oil Transportation and Storage Options
- Flow Assurance in Heavy Oil Production and Transportation
- Typical Flow Assurance Challenges
- Treatment and Mitigation Methods
- Heavy Oil Simulation Models
- Onshore and Offshore Heavy Oil Loading System
- Case Studies

Also, it is interested that the lecturer would have the capability of discussing and answering the questions about the following items:

Explaining commercial examples from Canada, America and Venezuela

Economic issues of heavy oil exploitation

Environmental issues and challenges of heavy oil exploitation

Exploitation engineering problems such as corrosion and scaling and the inhibition methods

A brief review of water management in heavy oil reservoirs

Screening guidelines for choosing the best recovery mechanism

Design of desalting and sweetening plants of a production unit of heavy oil field