



Wellhead, WO & Material Selection/ Purchase

Duration: 5 days

Candidates:

This course is designed for Well Operations Engineers, Workover Engineers, Production Engineers, and Operations staff to provide them with a detailed knowledge about wellhead equipment, completion equipment & workover operations. Engineers contributing in the Material selection and Purchase for Xmas Trees & Wellhead are good candidates for this course as well as it introduces a good knowledge about how to select the proper material of wellhead and tubular (tubing & casing) for certain conditions.

Summary:

This course is designed to help participants to build the necessary experience in wellhead operations including installation, testing and maintenance. It also provide a detailed overview about completion and workover operations with paying more attention on the well integrity issues and well control barrier philosophy and barrier envelope during a well life cycle.

A major part is customized for material specification and selection as per **API 6A or ISO 10423 Standards for wellhead equipment**. Material selection for completion equipment in terms of corrosion resistance is also considered as per **NACE-MR0175 or ISO-15156 Standards**.

Safety considerations and how to deal in emergency situations are also covered through some actual field examples.

Course Objectives:

Upon Completion of the course, participants will:

- Be Familiar with the different phases of installing wellhead equipment & X-Tree.
- Have detailed review about completion & WO equipment including wellhead items, tubing, nipples, SSD, PKRs, safety devices and other accessories.
- Identify the various wellhead equipment used in wellhead operations and explain their features and functions.
- Explain the concept of wellhead safety valves and recognize its importance in offshore wellhead operations
- Be acquainted with different terminologies for well integrity related to wellhead & tubular like MAASP, MAWP, and SCP...etc.

- Get the knowledge of how to specify and order the proper wellhead & X-tree materials for different conditions of pressure, temperature, sweet or sour conditions...etc.
- Able to specify and select the materials of completion equipment for different downhole conditions such as tensile stresses, corrosive conditions...etc.
- Be aware of reasons of performing workovers.
- Be familiar with different killing methods and techniques applied for both completion and workover operations.
- Know the purposes, types and methods of well intervention.
- Get an overview about well control philosophy, well integrity management "WIM" and barrier building strategy related to workover and completion operations.

Instruction Methods

The following is a simple list of the techniques that will be used during the course/workshop

- PowerPoint Presentations (as short as possible)
- Flip chart and white board Writings
- Videos
- Group quizzes
- Individual and group exercises
- Local and international case studies
- Key learning point reviews
- Practice, Practice and Practice

Course Contents:

(Day#1)

1- Wellhead Installation & terminology:

- Basic Definition & Function of Wellhead.
- Wellhead vs. X-Tree.
- Different phases of installing wellhead equipment.
- Casing Heads, Casing Spools, Casing Hangers and pack-offs.
- X-Tree types and components.

- Field practices for how to operate X-tree manual & actuated valves.
- Wellhead chokes.

(Day#2)

2- Detailed Overview of Completion Equipment & Workover Operations:

- Testing of wellhead & X-tree equipment:
 - Function testing of manual valves & safety items.
 - Pressure testing.
 - Criteria of accepting pressure testing.
- Main Completion Types
- Completion Equipment:
 - Upper Completion Equipment.
 - Lower Completion Equipment.
- Possible reasons for performing workover operations.
- Well Killing Methods: advantages & disadvantages.

(Day#3)

3- Wellhead & Completion Issues related to Well Integrity Management:

- Overview of Well Integrity and Barrier Envelope for a completed well.
- Well Integrity Terminology related to wellhead & completion:
 - MAASP.
 - MAWP.
 - SCP/SAP.
- Well Barrier envelope for different well types:
 - Natural flow well.
 - Artificially-lifted well.
 - Injection well.

(Day#4)

4- Materials specification & purchasing of Wellhead equipment AND Completion Equipment:

- Introduction to API-6A & ISO 10423 for WH equipment specifications
- Specifications related to pressure rating.
- Specifications related to temperature rating.
- Specifications related to corrosion resistance.
- Specifications related to testing requirements (Product Service Level).
- Selecting the right completion equipment for different conditions including tensile strength requirements and corrosion resistance needs (NACE-MR0175).
- .Examples of how to select and issue purchase order for wellhead equipment.

(Day#5)

5- WH Maintenance & Corrosion Monitoring in Oil Industry:

- Corrosion forms and reasons in oil & gas industry.
 - H2S Corrosion.
 - Chlorine Corrosion.
 - CO2 Corrosion.
- Methods of Corrosion Monitoring:
 - Downhole using Ultrasonic & MIT tools.
 - Surface using corrosion Coupons.
- Methods of Corrosion Mitigation/Prevention:
 - Using corrosion Inhibitors.
 - Cathodic protections.
 - Coating & lining materials.
 - Corrosion-resistant Alloys.
- Wellhead maintenance activities:
 - Routine Activities (Periodic).
 - Corrective Maintenance.
 - Pressure Testing.
 - Greasing & Lubrications.
 - Reporting.
 - Non-Destructive testing.
 - Repairs.