Wellhead and Christmas Tree Maintenance: API 6A Equipment, Pressure Testing and Valve Servicing

2 – 6 August 2027
Amsterdam - Zuidas business district hotel



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Introduction:

Wellhead and Christmas tree equipment sits at the surface end of every producing well, yet many leaks, stuck valves and failed seal tests trace back to equipment nobody greased on schedule, a packoff energised the wrong way or a pressure test run without a clear acceptance limit. This Core Concept course trains engineers and technicians to identify each wellhead and tree component, read API 6A ratings, install and nipple up equipment, run pressure tests, service gate valves and chokes, and trace seal leaks. Participants build a Wellhead and Tree Maintenance and Barrier Test Plan for a case well.

Course Objectives:

- Identify casing heads, casing spools, tubing heads, hangers, packoffs and tree valves on a wellhead stack and explain the pressure-containing role of each
- Read API 6A nameplates and data sheets for rated working pressure, temperature class, material class and specification level, and confirm replacement parts match the installed stack
- Plan wellhead installation, tree nipple-up and flange make-up with the correct ring gaskets, bolt torque sequence and test plug or back pressure valve
- Run body, seat and seal pressure tests on wellhead and tree equipment and record results against hold periods and allowable pressure drop
- Carry out valve greasing, stem packing replacement, choke trim change and actuator function checks to a written servicing routine
- Diagnose leaks at flanges, hanger seals, stem packing and valve seats and select the repair, including secondary seal injection and valve removal under pressure

Target Audience:

- Production engineers who operate wells through the tree and specify shut-in and choke settings
- Completion engineers who land tubing hangers and hand wells over with the wellhead and tree installed
- Maintenance engineers and wellhead technicians who grease, service and repair valves, chokes and actuators
- Well integrity engineers who witness wellhead and tree pressure tests and record barrier verification results
- Operations supervisors who schedule wellhead work, isolations and permits on producing sites

Course Outline:

Day 1: Wellhead System Architecture and Component Identification

- Wellhead Functions: Casing Suspension, Pressure Containment and Annulus Access
- Casing Head, Casing Spool and Tubing Head Stack-Up Drawing
- Mandrel and Slip-Type Casing Hangers and Tubing Hanger Designs
- Conventional Spool Wellheads Versus Compact and Unitised Wellhead Systems
- Wellhead Equipment Register and Site Survey Checklist

Day 2: Christmas Tree Configurations and API 6A Equipment Ratings

- Tree Valve Arrangement: Lower and Upper Master, Production Wing, Kill Wing and Swab Valves
- Gate Valve, Adjustable Choke and Positive Choke Construction
- Hydraulic and Pneumatic Actuators, Surface Safety Valve and SCSSV Control Line Interface
- API 6A Rated Working Pressure, Temperature Class and Material Class Tables
- API 6A Specification and Performance Levels and API 17D Subsea Tree Overview

Day 3: Installation, Nipple-Up and Pressure Testing Procedures

- Flange Types, Ring Gaskets and Bolt Torque Sequence for Make-Up
- Tubing Hanger Landing, Back Pressure Valve Setting and Tree Nipple-Up Sequence
- Test Plugs, Test Ports and Packoff Energising Checks
- Body, Seat and Seal Pressure Test Procedure with Hold Period and Pass Criteria
- Pressure Test Record Sheet and Barrier Verification Sign-Off

Day 4: Servicing, Sealing Systems and Leak Troubleshooting

- Gate Valve Greasing and Sealant Injection Routine with Grease Selection
- Stem Packing, Bonnet Seal and Choke Trim Replacement Steps
- Elastomer and Metal-to-Metal Seal Selection for Sour, High-Temperature and Erosive Service
- Leak Path Diagnosis Tree: Flange, Hanger Seal, Stem and Seat Leaks
- Annulus Valve Access, Gauge Installation and Monitoring Point Interface

Day 5: Inspection Walkthrough and Maintenance and Barrier Test Plan

- Wellhead Growth, Thermal Movement and Hot Work Near Wellheads at Overview
- Guided Walkthrough: Condition Survey of a Producing Well Wellhead and Tree
- Preventive Maintenance Interval Matrix by Valve Criticality and Service
- Case Well Build: Greasing Schedule, Test Frequencies and Acceptance Limits
- Wellhead and Tree Maintenance and Barrier Test Plan Presentation and Peer Review

Skills You Will Gain:

- Wellhead Stack Identification
- API 6A Rating Interpretation
- Flange Make-Up and Torque Control
- Wellhead Pressure Test Execution
- Gate Valve Servicing
- Seal Leak Diagnosis
- Choke and Actuator Maintenance
- Maintenance Interval Planning

Why Attend This Course:

- Return with a Wellhead and Tree Maintenance and Barrier Test Plan for a case well, ready to adapt to your own well stock
- Cut repeat valve and seal failures by linking greasing, packing and trim work to a written routine
- Check any replacement spool, valve or gasket against the installed ratings before it reaches site
- Compare wellhead servicing practice with engineers and technicians from onshore and offshore operators and service companies

Conclusion:

Surface well equipment stays reliable only when every component is correctly rated, installed, tested and serviced across the life of the well. The course moves from wellhead architecture and component identification through tree configurations and API 6A ratings, to installation, nipple-up and pressure testing, then to greasing, seal systems and leak diagnosis. The final day applies an inspection walkthrough and case well work, producing a Wellhead and Tree Maintenance and Barrier Test Plan that sets greasing schedules, test frequencies and acceptance limits.