Hot Tapping, Line Stopping and In-Service Pipeline Repair: Split Tees, Plugging and Sleeves

2 – 6 August 2027
Barcelona - Eixample district four-star



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Introduction:

Hot tapping, line stopping and in-service pipeline repair go wrong when a branch is welded onto a thin, low-flow line, a plug is set against the wrong pressure, or a sleeve is chosen before the defect is understood. Burn-through, cracked fillet welds, leaking plugs and unplanned shutdowns follow. This Core Concept course trains engineers to decide when a live connection is justified, design the fitting, control in-service welding, run the tapping machine and plugging sequence, and select a sleeve, clamp or composite repair. Each participant produces a Hot Tap and Line-Stop Job Plan.

Course Objectives:

- Decide whether a hot tap, a line stop or a planned shutdown is the right route for a tie-in, valve replacement or pipe section change
- Specify split tees, weld-on nozzles and reinforcement for a live connection from line size, wall thickness, pressure and contents
- Set in-service welding parameters that limit burn-through and hydrogen cracking risk using heat input, flow rate and wall thickness checks
- Plan and supervise hot tap machine setup, cutting, coupon retrieval and completion plug installation on a pressurised line
- Sequence line-stop plugging, bypass flow and pressure equalisation under an approved permit, isolation and risk assessment
- Select temporary or permanent repairs, including Type A and Type B sleeves, bolted clamps and composite wraps, against a defect assessment

Target Audience:

- Pipeline engineers who approve tie-ins, modifications and isolations on operating transmission and gathering lines
- Maintenance engineers and supervisors who organise and lead hot tap, line-stop and repair crews in the field
- Integrity engineers who disposition defects and specify the repair that returns a line to service
- Welding engineers and welding inspectors who qualify and oversee welding onto pressurised pipe
- Operations and permit-to-work coordinators who authorise live-line work and control isolations

Course Outline:

Day 1: Live-Line Intervention Decisions and Hot Tap Principles

- Hot Tapping Definition and Sequence From Fitting Installation to Machine Removal
- Hot Tap Versus Line Stop Versus Planned Shutdown Decision Matrix
- Contents Screening: Flammable Mixtures, Oxygen Enrichment and Hydrogen Partial Pressure Limits
- API RP 2201 Safe Hot Tapping Practices Overview and Job Approval Roles
- Line Condition Survey: Ultrasonic Wall Thickness Grid, Coating and Lamination Checks

Day 2: Fitting Design and In-Service Welding Controls

- Split Tee, Weld-On Nozzle and Full-Encirclement Fitting Selection
- Branch Reinforcement, Pressure Rating and Fitting Pressure Test Worksheet
- Burn-Through Risk Assessment From Wall Thickness, Pressure and Flow Velocity
- Hydrogen Cracking Control Through Heat Sink Measurement and Low-Hydrogen Electrodes
- API 1104 In-Service Welding Procedure and Welder Qualification Overview

Day 3: Hot Tap Machine Operation and Line-Stop Sequences

- Hot Tap Machine Setup: Cutter Travel Calculation, Pilot Drill and Coupon Retention
- Sandwich Valve Installation, Seal Test and Machine Pressure Equalisation Steps
- Line-Stop Plugging Heads: Pivoting, Folding and Sealing Element Types
- Temporary Bypass Arrangement Sizing, Flow Diversion and Pressure Monitoring
- Completion Plug Setting, Flange Blinding and Fitting Closure Procedure

Day 4: Permits, Isolation Risk and In-Service Repair Methods

- Live-Line Permit to Work, Job Safety Analysis and Simultaneous Operations Control
- Failure Cases: Plug Leakage, Coupon Loss, Burn-Through and Fillet Weld Cracking
- Type A Reinforcing Sleeve and Type B Pressure-Containing Sleeve Installation
- Bolted Leak Clamps, Epoxy-Filled Shells and Stand-Off Clamp Selection
- ASME PCC-2 Composite Wrap Repair Overview: Design Life, Surface Preparation and Cure

Day 5: Case Study: Hot Tap and Line-Stop Job Plan With Repair Selection

- Case Data Pack Review: Line Isometric, Operating Data and Inspection Findings
- Repair Selection Matrix Linking Defect Type, Remaining Wall and Service Life
- Job Step Sequence With Hold Points, Pressure Limits and Contingency Actions
- Crew, Equipment and Materials Schedule for the Live-Line Intervention
- Hot Tap and Line-Stop Job Plan Presentation and Peer Technical Challenge

Skills You Will Gain:

- Live-Line Intervention Planning
- Hot Tap Fitting Specification
- In-Service Welding Control
- Tapping Machine Operation
- Line-Stop and Bypass Sequencing
- Live-Line Permit Management
- Pipeline Repair Method Selection
- Composite Wrap Repair Oversight

Why Attend This Course:

- Return with a Hot Tap and Line-Stop Job Plan, including repair selection, built on a realistic case line
- Avoid unnecessary shutdowns by knowing when a live connection or isolation is safe and when it is not
- Recognise the burn-through, cracking and plug-leak warning signs before the crew is committed on site
- Compare field practice with pipeline, maintenance, integrity and welding staff from oil, gas, water and petrochemical operators

Conclusion:

Work on a pressurised line succeeds when the contents, the wall, the fitting, the weld and the isolation have been checked before the first arc is struck. The course moves from the decision to hot tap and API RP 2201 principles, through fitting design and in-service welding control, to tapping machine operation, plugging and bypass sequences, then permits, failure cases and sleeve, clamp and composite repairs. The final day turns this into a complete job plan with repair selection, presented for peer technical challenge.