Pipeline Pigging and In-Line Inspection: Pig Trap Operations and ILI Tool Selection

24 – 28 October 2027
Jeddah - Corniche four-star



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Ref: 542_17213 **Date:** 24 – 28 October 2027 **Location:** Jeddah - Corniche four-star **Fees:** 19500 SAR

Introduction:

Pipeline pigging and in-line inspection go wrong when pigs are chosen by habit, traps are opened under residual pressure, lines are sent to inspection still full of wax and scale, or ILI reports sit unread with no dig list. This Core Concept course gives operations, integrity and maintenance staff a working method for pig selection, launcher and receiver operation, pig tracking, stuck pig recovery, cleaning for inspection readiness, ILI tool selection and run planning, and turning feature lists into excavation priorities. Participants build a Pigging Programme and ILI Run Plan for a case pipeline.

Course Objectives:

- Select utility, cleaning, batching, gauging, foam and sphere pigs for a stated line condition, product and pigging objective
- Operate pig launchers and receivers with correct valve sequencing, isolation, venting, draining and safe closure opening
- Set pigging frequency and a cleaning progression that brings a line to a debris level acceptable for an inspection run
- Match MFL, ultrasonic, EMAT, caliper and IMU mapping tools to the threats, wall thickness and flow conditions of a pipeline
- Plan an ILI run from piggability survey and feasibility check through tracking, data acceptance and reporting
- Convert an ILI feature list into a ranked dig list with remaining strength screening and reassessment input for the integrity programme

Target Audience:

- Pipeline operations staff who launch, track and receive pigs and control flow during pigging runs
- Integrity engineers who specify inspection campaigns, accept ILI data and set response priorities
- Maintenance engineers and technicians who inspect, repair and modify pig traps, closures and trap valves
- Planners who schedule pigging programmes, ILI runs and follow-up excavations around throughput needs
- Inspection coordinators who manage ILI vendors, marker crews and verification digs

Course Outline:

Day 1: Why Pig: Pig Families and Pigging Programmes

- Pigging Objectives Map: Cleaning, Dewatering, Product Batching, Liquid Removal and Inspection
- Utility Pig Families: Mandrel Cup and Disc Pigs, Solid-Cast Pigs, Foam Pigs and Spheres
- Brush, Blade and Abrasive Stud Pigs for Wax, Scale and Black Powder Removal
- Gauging Plate Pigs and Bore Restriction Checks Before Any Inspection Run
- Pigging Frequency Setting From Debris Returns, Pressure Drop and Product Quality Records

Day 2: Pig Launcher and Receiver Design and Trap Operations

- Pig Trap Layout: Oversized Barrel, Reducer, Kicker Line, Bypass, Drain and Vent Connections
- Quick-Opening Closure Types, Pig Signallers and Trap Valve Interlock Schemes
- Launching Sequence: Loading, Purging, Pressurising and Kicker Valve Line-Up
- Receiving Sequence: Bypass Throttling, Pig Arrival Confirmation and Debris Handling
- Isolation, Depressurisation Verification and Safe Opening of Trap Closures With Residual Hazard Checks

Day 3: Pig Tracking, Stuck Pigs and Cleaning for Inspection Readiness

- Above-Ground Markers and Pig Tracking With Acoustic, Magnetic and Radio Transmitters
- Pig Speed Control, Bypass Pigs and Flow Rate Windows for Gas and Liquid Lines
- Stuck Pig Diagnosis and Recovery Options: Pressure Reversal, Flow Increase and Location by Transmitter
- Progressive Cleaning Train Design: Foam, Brush and Magnetic Cleaning Pig Sequence
- Debris Quantity Acceptance Criteria and Line Readiness Sign-Off for ILI

Day 4: ILI Technologies, Tool Selection and Unpiggable Lines

- MFL Axial and Circumferential Tools: Metal Loss Sizing, Sensor Resolution and Speed Limits
- Ultrasonic Wall Measurement and Crack Detection Tools and Liquid Couplant Needs
- EMAT Crack Detection in Gas Lines and Coating Disbondment Indications
- Caliper Geometry and IMU Mapping for Dents, Ovality, Bending Strain and Centreline Location
- Unpiggable Line Feasibility: Tethered, Self-Propelled and Low-Flow Tools and Temporary Traps

Day 5: ILI Run Planning, Data Reporting and Dig List Capstone

- ILI Run Plan Build: Piggability Survey, Tool Specification and Tool Qualification per API Std 1163
- ILI Report Review: Feature List, Pipe Tally, Reference Girth Welds and Data Acceptance Checks
- Metal Loss Screening With ASME B31G Remaining Strength and Dig List Ranking
- Linking ILI Results to Integrity Assessment and Reassessment Under API Std 1160 and ASME B31.8S
- Case Pipeline Capstone: Pigging Programme and ILI Run Plan Presentation and Peer Challenge

Skills You Will Gain:

- Pig Type Selection
- Pig Trap Operation
- Pig Tracking and Stuck Pig Recovery
- Inspection Readiness Cleaning
- ILI Tool Specification
- ILI Data Acceptance
- Dig List Prioritisation
- Piggability Assessment

Why Attend This Course:

- Return with a Pigging Programme and ILI Run Plan for a case pipeline that can be adapted to your own lines
- Open pig traps with a verified isolation and depressurisation routine instead of relying on memory
- Stop wasted inspection runs caused by poor cleaning, wrong tool choice or lost pig position
- Compare pigging and inspection practice with peers from crude, gas, refined products and water pipeline operators

Conclusion:

Pigging and inline inspection deliver value only when pig choice, trap handling, cleaning, tracking, tool selection and data review are planned as one campaign. The one week move from pig families and programme frequency to launcher and receiver design and safe trap operation, then tracking, stuck pig recovery and inspection readiness cleaning, then MFL, ultrasonic, EMAT, caliper and IMU tools and unpiggable lines. The final day produces a Pigging Programme and ILI Run Plan with a ranked dig list for a case pipeline.