



Process Technology Fundamentals Course for Plant Operators: Equipment, Start-Up and Rounds

5 – 9 September 2027

Riyadh - KAFD district five-star



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Introduction:

Process technology fundamentals course for plant operators on equipment, start-up and rounds is a five-day course for field operators, panel trainees and process technicians, ending with a unit start-up procedure and operator round sheet for a case process unit. Plants lose throughput and suffer avoidable trips when newer operators cannot relate gauges, P&IDs and equipment behaviour to the unit as a whole. Nominees already work shifts on oil, gas, petrochemical or chemical units, and the course is taught through inspection walkthroughs of case units and their drawings. CoreConcept Training Center delivers this course on process technology fundamentals.

Course Objectives:

- Explain the layout of a process unit from feed to product and the duties of field and panel operators on each shift
- Read pressure, temperature, flow and level at local indicators and compare them with panel values and normal operating ranges
- Trace process lines, instrument tags and valve line-ups on P&IDs at operator level
- Operate pumps, compressors, exchangers, fired heaters, columns, reactors, tanks and utility services to written operating steps
- Carry out start-up and shutdown sequences, operator rounds, log entries and shift handover to a set routine
- Recognise abnormal conditions and alarms, respond within operator limits and apply lockout-tagout and permit-to-work basics

Target Audience:

- Newly appointed field operators responsible for rounds, line-ups and local equipment starts on process units
 - Operator trainees preparing for a console position responsible for watching unit variables
 - Process technicians responsible for sampling, utility checks and equipment watch around the unit
 - Developing operators moving between units who must learn a new process and its equipment
 - Maintenance and utilities technicians who prepare equipment for operations and receive it back under permit
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Course Outline:

Day 1: Process Plant Layout, Operator Duties and Process Variables

- Feed-to-Product Block Diagram of a Typical Process Unit
- Field Operator and Panel Operator Duty Split Across Shifts
- Pressure Gauge, Thermowell, Flow Meter and Level Glass Reading
- Local Indicator Readings Cross-Checked Against Panel Values
- Normal Operating Range Card for Key Unit Variables

Day 2: P&ID Reading, Unit Operations and Control Loops for Operators

- ANSI/ISA S5.1 Tag Letters Used During Field Line Tracing
- ISO 10628 Equipment Symbols for Pumps, Drums and Exchangers
- Valve Line-Up Tracing from Battery Limit to Product Rundown
- Fluid Flow, Heat Transfer, Mass Transfer and Reaction Steps Map
- Controller Manual, Auto and Cascade Modes Seen from the Field

Day 3: Operating Process Equipment and Utility Services

- Centrifugal Pump Priming, Venting, Changeover and Seal Flush Checks
- Compressor Lube Oil, Anti-Surge Indication and Start Permissives
- Heat Exchanger and Fired Heater Line-Up and Light-Off Order
- Distillation Column, Reactor Bed and Storage Tank Watch Points
- Steam, Cooling Water, Instrument Air and Nitrogen Utility Checks

Day 4: Start-Up, Shutdown, Rounds, Abnormal Conditions and Isolation

- Normal Start-Up Checklist with Hold Points and Sign-Offs
- Planned and Emergency Shutdown Sequence and Depressuring Steps
- Operator Round Route, Log Readings and Shift Handover Notes
- Alarm Response and Abnormal Cues from Noise, Vibration and Leaks
- Lockout-Tagout Lock, Tag and Try with Permit-to-Work Roles

Day 5: Inspection Walkthrough of a Case Unit Start-Up Procedure and Operator Round Sheet

- Case Unit P&ID Walkthrough and Valve Line-Up Marking
 - Case Pump and Exchanger Start-Up Step Sequence Drafting
 - Case Furnace Light-Off and Column Warm-Up Hold Points
 - Case Isolation List and Return-to-Service Steps After Shutdown
 - Unit Start-Up Procedure and Operator Round Sheet Completion
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Skills You Will Gain:

- Process Variable Reading
- P&ID Line Tracing
- Valve Line-Up Preparation
- Rotating Equipment Start Checks
- Fired Heater Light-Off Routine
- Shutdown Sequence Execution
- Operator Round Logging
- Energy Isolation Awareness

Why Attend This Course:

- Deliver a unit start-up procedure and operator round sheet for a case process unit to the operations supervisor for review and adaptation
- Judge whether a reading, noise or alarm is within its normal range or must be reported and acted on at once
- Avoid equipment damage, off-specification product and unplanned trips caused by wrong line-ups or skipped start-up hold points
- Coach newer shift colleagues on gauge reading, round routes and handover notes using the same operator templates

Conclusion:

Back on the unit, the participant gives the operations supervisor and shift team a unit start-up procedure and operator round sheet that can be checked against the site's own P&IDs and operating manual. The shift team uses the round sheet to record readings the same way on every round and to flag drifts early, and the supervisor uses the start-up steps to brief crews before planned restarts. After its first use, the unit should review which hold points were missed, which readings drifted outside range and how long handovers took.

Frequently Asked Questions FAQ:

What should participants know before a process technology fundamentals course for plant operators?

Participants should already work on, or be assigned to, a process unit and have completed site safety induction. No engineering degree or calculation skill is needed; bringing a simplified P&ID or round sheet from their own unit helps them apply the walkthroughs.

How does a process technology fundamentals course for plant operators differ from a process engineering or troubleshooting course?

It concentrates on what operators read, check and do in the field: variables, line-ups, equipment starts, rounds and isolation. Engineering courses focus on design calculations and balances, while troubleshooting courses focus on structured diagnosis of unit upsets by experienced staff.

Why do process technology fundamentals stress operator rounds and logs?

Rounds and logs are how operators detect leaks, vibration, rising temperatures and level drift before an alarm sounds. Readings taken at fixed points let the shift compare values with normal ranges and hand over an accurate picture of unit condition.

What do participants take back from a process technology fundamentals course for plant operators?

Participants take back a start-up procedure and an operator round sheet for a case process unit, with line-up steps, hold points, reading points and normal ranges. Both can be adapted to their own unit and checked by their supervisor.
