

## LEVEL

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Knowledge

## PURPOSE

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This course makes possible a rapid mastery of panelist skills. The facilities are optimized and operated in a proactive way.

Successful participants will be granted the "Panel Operator" Certification.

## LEARNING OBJECTIVES

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Upon completion of the course, participants will be able to:

- communicate and work effectively with shift colleagues,
- explain in detail the processes using various documents (PFDs, P&IDs, control schemes, logic diagrams),
- identify risks related to equipment operation and process; to enforce adequate preventive actions,
- adjust the plant process parameters to optimize production rate, product quality and operating costs, minimize losses and releases,
- analyze the process key parameters to determine disturbance causes, and take appropriate corrective and preventive actions,
- prepare, start and shutdown a unit in safe conditions.

## WAYS AND MEANS

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Case studies and applications on generic dynamic simulators: 80% of the time spent in the training center. Reminding of necessary theoretical and technical fundamentals directly through simulator handlings. Training involves on-site work and supervision from mentors in the plant. Permanent interactive delivery method. Some pedagogical activities of this course can take place in OLEUM's facilities (subject to availability).

## LEARNING ASSESSMENT

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Continuous assessment, final test with real-life situation simulation exercises.

## PREREQUISITES

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To perform all the tasks of a field operator, in full compliance with SHE rules (at least for two areas).

## WHY AN IFP TRAINING CERTIFICATION?

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- An international recognition of your competencies.
- A Vocational Certificate delivered.
- An expertise confirmed in Panel Operator Certification.
- Ready-to-use skills.

## MORE INFO

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Customized simulators may be used in this training program. Esta formación se puede proponer en español.

## Agenda

### WELCOME (IF IN OLEUM FACILITIES)

Welcome/safety. PPE distribution. Presentation of the training.

### PANEL OPERATOR DUTIES & CONTROL ROOM ACTIVITIES

Panel operator role within the operation team; control room staff. Reporting and handover duties. Plant documentation: inventory, content, usage, role and duties of the panel operator.

2 d

### BASIC PROFESSIONAL TRAINING

Notions of industrial chemistry. Fluid mechanics: pressure, flowrates, fluid flow, pressure drops. Heat exchange: exchange mechanisms, resistance to heat transfer. Liquid-vapor equilibrium of pure substances and mixtures. Simulators: impact of operating parameters on the chemical reaction performances, heat exchanges through various types of heat exchangers, separation in a flash drum.

2 d

### PROCESS CONTROL, AUTOMATION & DCS USAGE

Process control:  
Constitution of a control loop, symbols used. Sensors and transmitters. Control valves. Controllers operating principles, inputs/outputs, internal parameters and tuning. Complex control loops (cascade, split range, multiple calculation blocks). Advanced control basics. Simulators: Valves characteristic curves. PID parameters tuning. Heat exchanger duty control. Split range configuration. Behavior analysis of complex control loops.  
Distributed Control System (DCS):  
Architecture and system components. Man - Machine Interface (MMI). Trends tools. Information flux between site and control room.  
Automation:  
Safety instrumented systems: PSS, ESD, HIPPS, EDP; architecture and relationship with DCS. Safety logics and cause & effect matrix.  
PLCs and automation: grafcet analysis, study of specific sequences.  
Simulators: furnace safety logics.

6 d

### EQUIPMENT OPERATION

For each: working principles, technology, ancillary systems, process control scheme monitoring, operation, alarms, safety devices.  
Pumps, compressors, drivers:  
Simulators: filters switch, operation of pumps; changes in operating conditions, capacity control of compressors, troubleshooting of a compressor; start-up of a steam turbine driven centrifugal compressor.  
Thermal equipment: heat exchangers, air coolers, furnaces, boilers:  
Simulators: fouling of a heat exchanger ; changing fuel supplied to burners, coil fouling, start-up and shutdown of a furnace.  
Specific equipment for a given assignment unit (gas turbines, solid handling, extruders...).

8 d

### PRODUCTS & PROCESSES

Composition and physico-chemical properties of feeds and products.  
Commercial product quality requirements, specification and standard tests. Mixing rules.  
Process units: role, principles, main equipment, specific hazards. Influence of the main operating parameters on the operation, consequences on process and products. Material balance.  
Distillation, absorption, stripping.  
Utilities: flare systems, air production, effluent treatment units, steam, water treatments...:  
Simulators: start-up and shutdown, operation and control of various process units (for instance: two-product distillation columns, multi draw-off distillation column, amine absorption and regeneration, sulfur recovery unit, hydrotreatment unit).

8 d

### INTEGRATED PLANT SAFE OPERATION

Panel operator safe behavior:  
Radio communication, other communication equipment. Teamwork, responsibility sharing. Transmission of know-how.  
Alertness, forward thinking plant operation. Alarm management.  
Application: role plays using the simulators (with panel operator views and FODs ).  
HSE in operation:  
Product, equipment and process-related risks; prevention and protection.

6 d

Risks related to operation of equipment, to decommissioning-commissioning and start-up of equipment, specific prevention measures.

Routine operations. Permit to work, work order, consignations and isolations.

Special operations: SIMOPS, black start. Emergency operation and crisis management.

Impact of plant operation on gas release into the atmosphere and on the wastewater treatment unit; minimization of releases.

Integrated plant operation:

Steady state runs: routine checks, operating windows, integrated plant behavior (inertia, interferences).

Global performances, margin optimization/impact of quality gaps.

Identification, analysis and reaction to upsets and equipment failures; stabilization.

Simulators: field round on a running process unit; commissioning, start-up and shutdown procedures, justifications of different steps; inhibition management; operations in downgraded situations; practice of emergency operations.

## ASSESSMENT

Continuous assessment (including practical exercises on simulators).

Final test with real-life situation simulation exercises to validate objectives.