CONCEPT

# Ethylene Oxide and Ethylene Glycol Plant Operations Course: Selectivity and MEG Quality

28 February – 4 March 2027
Jeddah - Corniche four-star



# Ethylene Oxide and Ethylene Glycol Plant Operations Course: Selectivity and MEG Quality

**Ref:** 1668_26255 **Date:** 28 February – 4 March 2027 **Location:** Jeddah - Corniche four-star **Fees:** 19500 SAR

## Introduction:

Ethylene oxide and ethylene glycol plant operations, with a focus on selectivity and MEG quality, is a 1-week course for staff who run and support EO reaction, carbon dioxide removal, EO recovery and glycol sections, ending with an EO/MEG Unit Selectivity and Product Quality Action Plan for a case plant. Units lose ethylene to carbon dioxide when moderator dosing drifts, silver catalyst ages unnoticed and off-grade glycol fails fibre-grade checks. Nominees already work on an EO/MEG unit and learn through case studies built on panel trends and laboratory results. CoreConcept Training Center delivers this ethylene oxide and ethylene glycol course.

## Course Objectives:

- Trace ethylene, oxygen, water and glycol flows through the EO/MEG unit and read selectivity and consumption indicators per tonne of product
- Operate silver catalyst EO reactors within inlet oxygen, temperature and chloride moderator limits to hold selectivity as the catalyst ages
- Run hot carbonate carbon dioxide removal, EO absorption and EO stripping so that recycle gas composition and EO recovery stay on target
- Apply safeguards against EO flammability, vapour decomposition and polymerisation at the oxygen mixing station, recycle loop and EO storage
- Control glycol reaction water ratio, multi-effect evaporation and vacuum glycol distillation to meet fibre-grade MEG specifications
- Prepare an EO/MEG unit selectivity and product quality action plan from case plant data

## Target Audience:

- Staff responsible for panel operation of EO reactors, the recycle gas compressor and the oxygen mixing station
- Staff responsible for field rounds, sampling and line-ups in carbonate, EO recovery and glycol sections
- Staff responsible for shift supervision, start-up, shutdown and trip recovery on EO/MEG units
- Process engineering staff responsible for selectivity targets, moderator settings and catalyst performance tracking
- Technical service and laboratory staff responsible for MEG product quality investigations and release testing

## Course Outline:

### Day 1: EO/MEG Value Chain, Unit Flowsheet and Performance Baseline

- MEG, DEG and TEG Demand Across Polyester and Antifreeze Uses
- EO/MEG Block Flow Diagram From Ethylene Feed to Loading
- Oxygen-Based Versus Air-Based EO Process Route Comparison
- Ethylene Consumption and Selectivity Indicators per Tonne of MEG
- Unit Baseline Review of Shift Logs and Laboratory Records

### Day 2: Silver Catalyst EO Reactors, Selectivity and Chloride Moderation

- Silver on Alumina Catalyst Promoters and Ageing Behaviour
- Multitubular Boiling-Water Reactor Shell Steam and Temperature Control
- Selective Oxidation Versus Total Combustion Heat Release Balance
- Ethyl Chloride Moderator Dosing and Effective Chloride Factor Trending
- Catalyst End-of-Run Signals and Reactor Temperature Rise Strategy

### Day 3: Recycle Gas Loop, Carbon Dioxide Removal and EO Recovery

- Recycle Gas Composition Control for Oxygen, Ethylene and Ballast
- Hot Potassium Carbonate Absorber and Regenerator Performance Checks
- EO Absorber Lean Water Rate and EO Loss to Vent
- EO Stripper and Reabsorber Operation for Light Ends Removal
- Recycle Gas Compressor Operating Envelope and Argon Purge Rate

### Day 4: EO Hazards, Glycol Reaction, Evaporation and MEG Quality

- EO Flammability Envelope and Vapour Decomposition Ignition Sources
- Oxygen Mixing Station Interlocks Reviewed Through HAZOP and LOPA
- EO Storage Polymerisation Prevention and Nitrogen Padding Practice
- Glycol Reactor Water Ratio and Ethylene Carbonate Route Comparison
- Multi-Effect Evaporator and Vacuum MEG Column Product Purity Control

### Day 5: Case Study on Selectivity Loss and Off-Grade MEG

- Case Data Pack of Reactor Trends and Laboratory Analyses
- Case Moderator Drift Diagnosis and Selectivity Recovery Options
- Case MEG UV Transmittance and Aldehyde Failure Root Cause
- Case Safety Barrier Gap Ranking With Accountable Owners
- EO/MEG Unit Selectivity and Product Quality Action Plan Completion

## Skills You Will Gain:

- EO Selectivity Monitoring
- Chloride Moderator Adjustment
- Silver Catalyst Ageing Assessment
- Carbonate Absorber Troubleshooting
- EO Decomposition Hazard Recognition
- Glycol Evaporation Control
- Fibre-Grade MEG Release Testing
- Unit Performance Gap Analysis

## Why Attend This Course:

- Deliver an EO/MEG Unit Selectivity and Product Quality Action Plan to the production manager and technical service head for use on the case unit
- Decide whether a selectivity drop calls for a moderator, inlet oxygen or reactor temperature change before ethylene losses grow
- Avoid off-grade MEG cargoes, oxygen mixing trips and unplanned catalyst change-outs caused by late reading of trends
- Coach panel operators and new shift staff on moderator trends, carbonate checks and EO handling using the course checklists

## Conclusion:

Back at the plant, the participant hands the production manager and technical service head an EO/MEG Unit Selectivity and Product Quality Action Plan. Process engineers use it to set moderator and reactor temperature targets as the catalyst ages, and shift supervisors adopt its carbonate, EO recovery and glycol checks as daily controls. The safety barrier ranking feeds the next HAZOP revalidation. After the first month under the plan, the unit should compare selectivity, ethylene consumption and MEG release results with the baseline and reset actions that missed.

## Frequently Asked Questions FAQ:

### What should participants know before the ethylene oxide and ethylene glycol plant operations course?

Participants should already work on an EO/MEG unit as an operator, supervisor or engineer and read process flow diagrams, panel trends and laboratory sheets. Bringing anonymised reactor trends or MEG test results helps them apply the case study to their own unit.

## How does ethylene oxide and ethylene glycol plant operations training differ from an olefins cracker or reactor design course?

This course follows one EO/MEG unit from ethylene and oxygen feed to fibre-grade MEG with an operations focus. Cracking furnaces, cold sections and general reactor sizing theory belong to neighbouring courses and appear here only where they explain EO/MEG practice.

## Why does chloride moderator dosing matter in ethylene oxide and ethylene glycol plant operations?

Chloride moderator dosing sets the balance between selective oxidation to EO and total combustion to carbon dioxide on the silver catalyst. Too little lowers selectivity and too much suppresses activity, so operators trim it as the catalyst ages and conditions change.

## What do participants take back from the ethylene oxide and ethylene glycol plant operations course?

Participants take back an EO/MEG Unit Selectivity and Product Quality Action Plan built on case data, with a selectivity recovery plan, an off-grade MEG root cause review and a ranked list of safety barrier actions ready to adapt to their own unit.