

**Course Content**



**Title:** Catalytic Reforming Process Technology

**Potential PDH:** 24      **Code:** BTT041

**Description:**

The catalytic reforming process is critical to the overall economic balance of the modern petroleum refinery. This program has been developed to provide an in-depth, yet practical review of the current technology available in the processing areas of catalytic reforming and naphtha pretreating. The speakers will cover topics ranging from the basic process chemistry through commercial unit operations. The interactions between feedstock types, yields, product quality, catalysts, cycle length, and operating process variables will be explained. In addition, unit monitoring, troubleshooting, catalyst regeneration, and process evaluation methods will be discussed. A thorough understanding of these principles and techniques is necessary to optimize the performance of the catalytic reformer and, ultimately, to maximize the profitability of the unit.

**Outline:**

INTRODUCTION TO CATALYTIC REFORMING

- Process History
- Position in Refining Process
- Unit Designs
- Reactor Designs
- Review of Licensed Processes

CHEMISTRY OF REFORMING

- Reaction Chemistry
- Metal/Acid Functions

REFORMING PROCESS VARIABLES

- Operating Variables: Severity, Pressure, H<sub>2</sub>/HC Ratio, Feed Properties, Catalyst Type
- Effect of Variables on Yields, Catalyst Activity,
- Catalyst Stability and Product Quality

REFORMER OPERATING SCHEMES

- Unit Optimization
- Aromatics Production
- Revamp Options
- Continuous Reforming
- Reformulated Gasoline Options
- Energy Conservation

REFORMING CATALYSTS

- Catalyst Composition and Types
- Commercial Catalysts
- Evaluation of Catalyst Changeout
- Role of Sulfur in Reforming

REFORMING CATALYST PROCEDURES

- Unit Start-Up
- Catalyst Regeneration

REFORMER MONITORING

- Feed/Catalyst Sampling and Analyses

**Course Content**

- Data Normalization
  - Catalyst Samplers
- CONTINUOUS CATALYTIC REGENERATION
- CCR Unit Operation
  - Advantages/Disadvantages
- REFORMER TROUBLESHOOTING
- Performance Evaluation
  - Operating Variable Effects
  - Water/Chloride Balance
  - Feed Contaminants
  - Catalyst Problems
- NAPHTHA HYDROTREATING
- Naphtha Sources
  - Hydrotreating Reactions
  - Catalyst Compositions and Selection Rationale
  - Process Variables
  - Recombination Reaction
  - Troubleshooting

**Instructor:**

## Instructors:

Barry A. Robinson is a Senior Staff Process Engineer for Cenovus Energy. His duties include capital project development and mentoring of process engineers. Barry was previously employed by Sunoco, BP, and Marathon in their Corpus Christi, Toledo, and Detroit refineries where he provided technical service, capital project development and execution, process unit commissioning, and process engineering management services. He has experience in catalytic reforming, hydrotreating, aromatic extraction, para/ortho xylene production, fluid catalytic cracking, delayed coking, sulphur recovery, and light ends separation processes. Barry has performed work on over \$800 million worth of capital projects, including six FCC revamps and a grassroots delayed coker/sulphur recovery complex. He also spent six years employed by an engineering contractor. Barry spent two years in technical service coverage of both a semi-regen UOP Platformer in BTX operation and an Amoco Ultraformer cyclic unit in motor gasoline operation. In addition he spent three years managing technical service coverage of a UOP CCR unit in gasoline operation. Barry holds a B.S. in Chemical Engineering from The Ohio State University, and a MBA from Bowling Green State University.