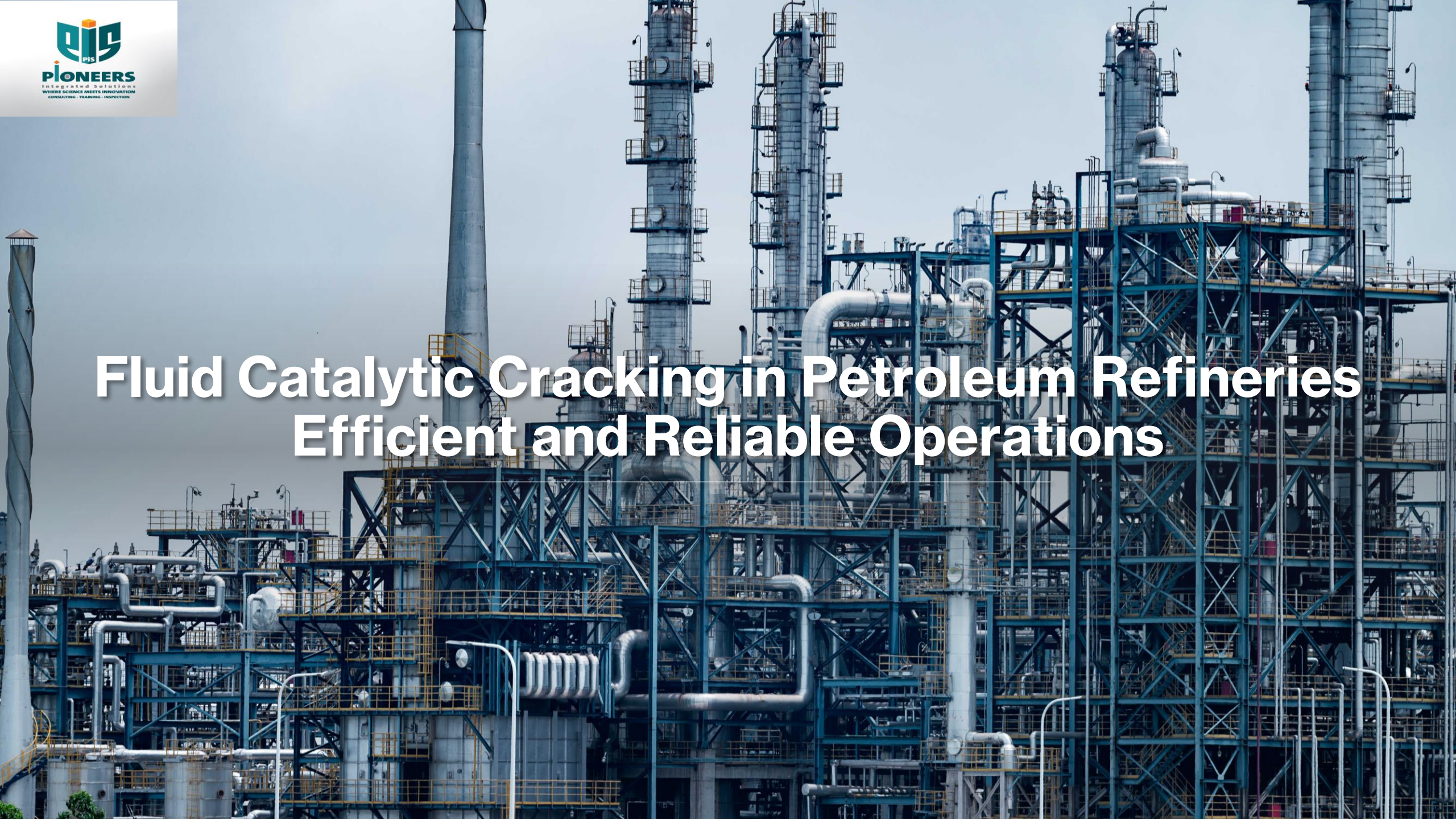

Fluid Catalytic Cracking in Petroleum Refineries
Efficient and Reliable Operations

Course Description:

- **Introduction:**

Fluid Catalytic Cracking (FCC) is one of the most crucial conversion processes in a petroleum refinery and plays a vital role in an integrated refinery. The FCC process will be likely used for biofuels and possibly for reducing CO2 emissions. The fluid catalytic cracking unit (FCCU) is a critical asset in refineries, requiring optimized processes in the context of engineering design to process a wide variety of feeds. The operation of the cat cracker must also be adjusted and maintained at optimum conditions for maximum profitability. This Pioneers training course will cover the FCC process. FCC unit converts feedstocks into valuable products, FCC feedstock quality and cracking, cracking technology and maximizing FFCU, and troubleshooting deals with identifying and solving problems.

The course will highlight

FCC process in petroleum refinery Process control and feed characterization Reactions chemistry and FCC performance Cracking technology and maximize FFCU Troubleshooting

Organizational Impact:

- The organizational impact will be demonstrated by the employees participating in this training course:

- Understanding the process incorporates most phases of chemical engineering fundamentals in petroleum refinery.
- Better understanding to control operation unit safely, optimizing feed rate, product qualities, and environmental controls.
- A clear understanding of feed physical properties is essential to successful work in troubleshooting, catalyst selection, unit optimization, and any planned revamp.
- Gain new insight and up-to-date of different FCC catalyst technologies on the market today.
- Enhance the knowledge of selective modifications of the unit's components to increase reliability, flexibility, and product selectivity and reduce emissions.

The course will highlight

- **Personal Impact**
- **Upon completion of this pioneers training course, participants will gain:**

  - Improve knowledge of chemical engineering fundamentals in petroleum refinery
  - How to control FFCU operations safely, optimizing feed rate, product qualities, and environmental controls
  - Improved the skill and knowledge of troubleshooting, catalyst selection, unit optimization, and any planned revamp.
  - Fundamental understanding of catalyst technology and getting the latest information and up to date to improve maximization.
  - Gain the knowledge of selective modifications of the unit's components to maximize FFCU.
  - Managing troubleshooting all components in FFC including a performance with effectively and timely

Course Methods

How will this Training Course be Presented?

- Participants in this pioneers training course will receive thorough training on the subjects covered by the seminar outline with the Tutor utilizing various proven adult learning teaching and facilitation techniques. Seminar methodology includes classroom-style with highly interactive, exercise, and case studies. The training course will be run using a PowerPoint slide and video.

Course Objective

At the end of this training course, you will learn to:

- Understanding the FCC process and incorporate chemical engineering fundamentals in petroleum refinery.
- Explain process control operation and feed physical properties.
- Describe the chemistry of reactions and FCC performance to optimizing feed rate and product qualities.
- Understanding of cracking technology, the latest development and maximize FFCU.
- Understanding of troubleshooting with effective and timely.

Course outline

Day One: FCC Process

- Refining processes
- Refineries configuration
- Fluidization and FCCU
- The reactor regenerator
- Partial versus complete combustion
- The FCC gas plant
- Product treating
- LPG
- Ultra-low sulfur gasoline (ULSG)

Day Two: Process Control and Feed Characterization

- FCCU process control
- Basic process control
- Advanced process control
- Hydrocarbon classification
- Feedstock properties
- Feedstock impurities
- Metals

Course outline

Day Three: Reactions Chemistry and FCC Performance

- Thermal cracking reactions
- Catalytic reactions
- Material balance
- Heat balance
- Pressure balance
- Case study

Day Four: Cracking Technology and Maximize FFCU

- Reaction technologies
- Stripping technology
- Regeneration technology
- Resid catalytic cracking
- Maximize FFCU performance

Course outline

Day Five: Troubleshooting

- Effective troubleshooting
- Catalyst losses
- Coking/fouling
- Hot gas expanders
- Increase in after burn.