APPLY RCA METHODS IN OIL & GAS FACILITIES

TRAINIT ACADEMY

MUE258
Mechanical & Utility Engineering

COURSE TITLE

APPLY RCA METHODS IN OIL & GAS FACILITIES

COURSE DATE/VENUE

26 - 30 July 2021

London, UK

COURSE REFERENCE

MUE258

COURSE DURATION

05 Days

DISCIPLINE

Mechanical & Utility Engineering

COURSE INTRODUCTION

Problem Solving in the process industry is often characterized by ·either inference based on cause and effect relationships or highly involved theoretical approaches. Neither of these approaches is satisfactory in a modern manufacturing environment. The cause/effect inference approach while being expedient often results in solutions that do not eliminate the problem, but in fact make the problem worse. The more sophisticated highly theoretical approach is rarely expedient enough to satisfy time constraints in a production facility. Thus one of the most frequent industry requests to the academic world is "give us people that can solve problems".

This program presents an approach that emphasizes the classical problem solving approach (defining the sequence of events) with the addition of the steps of formulating a theoretically correct working hypothesis, providing a means to test the hypothesis, and providing a foolproof means to eliminate the problem. The initial part of the seminar focuses on defining the problem that must be solved and obtaining the location, time and

quantity based specifications of the problem. The initial part of the seminar is suitable for all engineering disciplines as well as non-engineers.

The second part of the seminar deals with the utilization of chemical engineering fundamentals to develop a technically correct working hypothesis that is the key to successful problem solving. The primary emphasis is on pragmatic calculation techniques that are theoretically correct. These techniques have been developed by the Seminar Instructor in 40+ years of industrial experience. Using these techniques, theoretically correct working hypotheses can be developed in an expedient fashion.

The training includes both sample problems as well as problem working sessions to allow the participants to develop confidence with the approach.

The attendees are encouraged to bring real problems that they are working to use in discussions on the last day of the seminar. These problems should be of a non-confidential nature that can be discussed without violation of any confidentiality restrictions.

COURSE OBJECTIVE

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

- Apply and gain an in-depth knowledge on process plant troubleshooting and engineering problems solving through various practical exercises carry out during the course
- Enumerate the components of plant problem solving as well as the various troubleshooting techniques on engineering problem solving by familiarizing the potential sources
- Specify the limitations to plant problem solving through sources of historical data and become aware of the daily monitoring system guidelines by setting trigger points

- Apply the methods of risk analysis particularly HAZOP and MSDC in process plant troubleshooting and practice the process of engineering problem solving through sample problems in troubleshooting
- Discuss the scope of applied economics including other valuation forms & methods, and review the guidelines for problem solving temperature, pressure and level
- Employ the simplified approach in solving compressor problems and know distillation, plates & tray stability and discuss clearly the elements of measurements & verifications, and carry-out sample exercise on kinetics, flow, mechanical and designs
- Recognize the attributes of equivalent piping lengths, commercial correlations, and fluids by means of practical exercises
- Discuss the importance of two phase flow including its attributes and applications and analyze the characteristics of controllers, feedback, feed forward and cascade controls used in process control
- Improve knowledge on process control and optimization, process analyzers,
- Distillation multiple control, volume control, condenser control, and control project drawback
- Develop an understanding on heat transfer and various troubleshooting techniques and applications in used process plant
- Implement several strategies on distillation column packing and identify the different forms of hazards to equip participants with the QRA procedures and demonstration
- Carry out the latest methodology of MSDS and discuss if the needed information is good enough or incomplete
- Identify various accidents in the process plant and know what a consequences of accident

COURSE AUDIENCE

This course is intended for supervisors / Engineers / Senior operators / Operators / Process engineers.

COURSE CONTENT

DAY 1

1. **Introduce Process Troubleshooting Philosophy**
    - Trouble Shooting Objective
    - Problem Solving Concepts
    - IPO Chart “input-process-output (IPO) model”
    - What is a PROBLEM
    - Common process abnormalities
    - Investigate, identify & apply corrective action
    - What happens when bad decisions are made?
    - Six steps to ensure a Best decision in problem solving (PS)
    - Approaches to solve a problem:
      1. Algorithmic 2. Heuristic
    - Process Troubleshooting Philosophy
    - Cause Effect Diagram 4M
    - TROUBLE SHOOTING IN THE PROCESS INDUSTRIES
    - TROUBLE SHOOTING APPLIES SIX-STEP PROBLEM SOLVING METHOD

CLASS EXAMPLE: Let’s discuss this process with preheat, packed bed reaction, and effluent cooling

DAY 2

2. **Leadership**
    - The Definition of Leadership
    - What are important Leadership personality traits?
    - 7 Secrets of Leadership Success
    - HSE MANAGEMENT SYSTEM (HSEMS)
    - The leadership barriers
    - What are management and leadership?
    - Qualities of leadership

- Leaders' Top Three Mistakes

3. **Risk Assessment& Management**
    - Definitions
    - What is a risk assessment?
    - Why is the risk assessment important?
    - Hazards Identification (HAZID)
    - Conduct a preliminary job review Meeting
    - 5 Steps Of Risk Assessment
    - Likelihood (Probability)& Impact (Severity)
    - Likelihood Rating Guidance
    - SEVERITY Rating Guidance
    - Risk Ranking
    - Risk Management
    - Risk Control "Engineering, Administrative& Personal Protective Equipment"

DAY 3

4. **Root Cause Analysis (RCA)**

A. Root Cause analysis Tools:

- Ishikawa Charts (Fish Bone)
- Design of Experiments
- Is / Is not Analysis
- 5 Why's
- Cause & Effect Diagram.
- Statistical Data Analysis (Cpk, Paretto Charts, Anova,etc…)

B. Failure Mode and Effect Analysis

- FMEA Origination
- The different types FMEA

- FMEA's Link with Continuous Improvement
- Our focus is on Process FMEA
- FMEA Worksheet
- Why we use FMEA
- When to use FMEA
- Potential Applications of FMEA
- Steps on completing FMEA

5. **Problem Solving& Decision Making**
    - Investigate, identify
    - 6 C's of Decision Making
    - Decision Making Process
    - Decision Making Process Example
    - Why is Intuition
    - Decision Making Conditions
    - Decision Making Style
    - Common Decision Making Errors
    - Characteristic of a Decision Making Effectiveness
    - Apply corrective action

DAY 4

6. **Management of Change (MOC)**
    - Why we make Changes?
    - Administrative Change
    - Organizational Change
    - Technical Change
    - MOC Policy
    - MOC Program
    - MOC Procedure
    - Process Modification
    - Process Change

- PFCP “Process & Facilities Change Proposal”
- Why MOC is necessary
- PSSR “Pre Startup Safety Review”

  Case study: “SPIRAL TO DISASTER”

7. **HAZOP “Hazards& Operability Studies”**
   - Introduction
   - The HAZOP Concept
   - The HAZOP team
   - Team members and responsibilities
   - When to perform a HAZOP
   - Types of HAZOP
   - HAZOP procedure
   - Modes of operation
   - Examples of process parameters
   - The basic HAZOP guide-words
   - HAZOP Node

     Class Example: “Fired Heater”

DAY 5

8. **Maintenance Management**

   - Maintenance Engineering Objectives
   - Maintenance Terms and Definitions
   - Preventive Maintenance
   - Objectives of PM
   - Failure of PM Programs In Maintenance Organizations
   - Why Do Plant Needs Preventive Maintenance Program
   - Typical Human Behaviors
   - Maintenance KPI’s

COURSE CERTIFICATE

TRAINIT ACADEMY will award an internationally recognized certificate(s) for each delegate on completion of training.

COURSE FEES

$6,150 per Delegate. This rate includes participant's manual, Hand-Outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

COURSE METHODOLOGY

The training course will be highly participatory and the course leader will present, guide and facilitate learning, using a range of methods including formal presentation, discussions, sector-specific case studies and exercises. Above all, the course leader will make extensive use of real-life case examples in which he has been personally involved. You will also be encouraged to raise your own questions and to share in the development of the right answers using your own analysis and experiences. Tests of multiple-choice type will be made available on daily basis to examine the effectiveness of delivering the course.

- 30% Lectures
- 30% Workshops and work presentation
- 20% Case studies & Practical Exercises
- 10% Role Play
- 10% Videos, Software or Simulators (as applicable) & General Discussions