FERTILIZER ACADEMY
Knowledge hub for the Fertilizer industry

Course title:

Fundamentals and Best Practices for Ammonia Plants Operation and Maintenance

Introduction:

This training course outlines the standards and best practices for the Ammonia Plant Operation and Maintenance.

It covers operation, maintenance, storage and handling and is a reference for engineering and design and emergency planning and response for facilities that manufacture or store Ammonia to manufacture fertilizers and explosive grade ammonium nitrate.

It is also intended to guide best practices and standards for the design, operation, and maintenance of new and existing ammonia facilities and emergency planning and response.

Duration 8 hours. (one day)

Course outline:

Module 1 - Introduction

1. Introduction
2. Application

Module 2 – Ammonia Characteristics

1. Physical Properties of Ammonia
2. Characteristics and Hazards of Ammonia
3. Health Hazards
4. Hazards Classification
5. Fire Hazards
6. Process Safety Management

Module 3 - Catalysts

1. General aspects

Author(s) / Trainer(s):

Venkat Pattabathula

Ammonia Process Consultant,

Venkat Pattabathula has more than 35 years of experience in nitrogen manufacturing industry in various parts of the world such as Asia, North America, and Australia.

Extensive experience in process design and engineering of world scale ammonia/urea projects valued at more than US$ 600 million engineered by different process licensors and EPC companies.

A Technology Manager experienced in being responsible for economic evaluation and technology selection in plant upgrades and performance guarantees on all ammonia plant related projects.

A track record of identifying and documenting Best Practices in ammonia production processes to achieve world class safety and reliability standards.

Venkat is a chartered professional engineer (CPE) of Engineers Australia and a registered professional engineer of Queensland (RPEQ) and a life member of American Institute of Chemical Engineers (AIChE).

Venkat was elected to the AIChE Ammonia Safety Committee in 2005 and has been on the committee since then.

Venkat has published >130 papers with a focus on NH3 process safety, plant incidents and technology developments.

He is also on the Editorial Advisory Board of Chemical Engineering Progress (CEP) magazine of AIChE.

2. Catalysts Performance
3. Catalysts Handling and Usage
4. Catalyst Selection

Module 4 – Carbon Dioxide (CO2) Removal

1. Solvents
2. Operational issues
3. Troubleshooting

Module 5 - General Equipment Design and Operational Considerations

1. Safety Systems
2. Pressure Vessels and Tanks
3. Heat Exchangers & Process Heating
4. Utility Systems

Module 6 - Equipment Service Specific Design and Operational Considerations

1. Desulphurisation
2. Primary Reformer
3. Secondary Reformer
4. Waste Heat Boilers
5. Carbon Monoxide Converters
6. CO2 Removal Section
7. Methanation
8. Compression
9. Ammonia Synthesis
10. Process and Steam Condensate
11. Safety Instrumented Systems (SIS)

Module 7 – Ammonia Storage

1. Storage and Handling Practices
2. Ammonia Storage Tanks
3. Pressurised Storage
4. Instrumentation and Control
5. Storage Area Electrical Equipment
6. Refrigeration System
7. Location of Storage
8. Stress Corrosion Cracking

Module 8 – Water Treatment

1. Boiler Water Treatment
2. Cooling Water Treatment

Module 9 – Energy Efficiency and Advanced Process Control

1. Energy Efficiency
2. Advanced Process Control (APC)

Module 10 – Piping Systems

1. General Layout
2. Jacketed Piping

Module 11 – Civil and Structural Design

1. General Information

Module 12 – Piping Systems

1. General Information

Module 13 – Materials of Construction

1. General Layout
2. Jacketed Piping

Module 14 – Maintenance Activities

1. General
2. Clearing Equipment
3. Hot Work/Work Permitting/Vessel Entry
4. Steam Tracing
5. Scaffolding

Module 15 – Summary of Mandatory Requirements

1. Recap

Learning outcomes:

By the end of this training course you will understand:

- What are the best practices for operation, maintenance, storage and handling in ammonia plant facilities,
- What are the best practices and standards for the design, operation, and maintenance of new and existing ammonia facilities, and for emergency planning and response.

Who will benefit:

Without being an all-inclusive training program, this course is addressed to operation, maintenance, and engineering personnel working in ammonia plants, which will benefit in

understanding specific hazards in Ammonia Plants best-practice guidelines to mitigate those particular risks. This course will guide design and plant engineers on best practices and standards for the design, operation, and maintenance of new and existing ammonia facilities and for emergency planning and response.

Course materials:

- Hand-out presentation slides in PDF format

Price:

€ 800

Discounts:

- 2 places – 10% discount
- 3 places – 15% discount
- 4 or more places – 20% discount.

In-company training:

This course is also available as an in-company course (face-to-face or online) where content can be customised to meet your organisation's specific needs and delivered on a date/location that suits your requirements.

Contact us for more information.

Training code: AMO05