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
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