FERTILIZER ACADEMY

Knowledge hub for the Fertilizer industry

Course title:

Ammonia Process for Operators and Engineers

Introduction:

This training course is a combination of theoretical principles of various ammonia plant operation combined with operational experience.

Suitable for both operators and engineers willing to go the next step forward and understand the basic theory behind the design of ammonia plants. The training address main ammonia plant units, key equipment design and modelling as well performance evaluation.

Duration 8 hours.

Course outline:

Lessons

1. Centrifugal Compressors
2. Centrifugal Pumps
3. CO2 Removal
4. Compressor Modelling
5. Desulfurization
6. Front End Material Balance Modelling
7. Heat Exchanger calculations with phase change modelling
8. Heat Exchangers
9. Laboratory Details for Operators and Engineers
10. Methanation and Front End Compositions
11. Laboratory Details for Operators and Engineers
12. Methanation and Front End Compositions
13. Primary Reformer Radiant Section
14. Process Air Compressor.docx Program to progress
15. Program to progress-by category
16. Process Safety Valves
17. Pump and System Modelling
18. Purge gas and its recovery
19. Reformer Convection Bank
20. Reformer Modelling
21. Refrigeration

Author(s) / Trainer(s):

Bob Edmondson

Ammonia Process Consultant,

Bob has over 40 years of experience in Nitrogen Fertilizers with work done for Kellogg, Uhde, Fluor, CF Braun , N-Ren plants in Canada, China, Trinidad.

Revamps include taking plants to 140+% of nameplate for ammonia and 165% for urea. A number of interesting revamp items include:

- Process air compressor capacity increase with supplementary air injection,
- Expanding Reformer radiant section capacity by extension of box and addition of tubes
- Addition of feed gas saturator coil
- Desulfurization expansion
- Pre-reformer addition
- Secondary reformer boiler upgrades
- Benfield unit debottlenecking
- Syngas compressor boosting
- Makeup gas ammonia converter with waste heat boiler
- Ammonia wash with loop rerouting
- Refrigeration capacity increase
- Synthesis loop debottlenecking
- HRU capacity increase
- Turbine Upgrades

For urea plants his experience is mainly with Stamicarbon technology and revamps to increase synthesis and granulation capacity to 165% of nameplate.

22. Revamp Options and Considerations
23. Revamp Options and Considerations-Engineering
24. Screw compressors
25. Secondary Reformer Boiler
26. Secondary Reformer Principles
27. Separators
28. Shift Conversion
29. Steam Turbines and Other Variable Speed Drivers
30. Synthesis Gas Compression
31. Synthesis Gas Drying
32. Synthesis Loop and Refrigeration Modelling
33. Synthesis Loop
34. Trip Systems

Learning outcomes:

By the end of this training course you will understand:

- Basic modelling principles for ammonia plant units
- How to consider revamp options of plants to maximize efficiency, minimize downtime, reduce safety risks and maximize production
- Learn about laboratory capabilities to know what the laboratory can offer to troubleshoot the issues once raised.

Who will benefit:

This course is suitable for entry-level design engineers in EPC organisations, ammonia plant operators and junior engineers in fertilizer plants.

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: AMO06