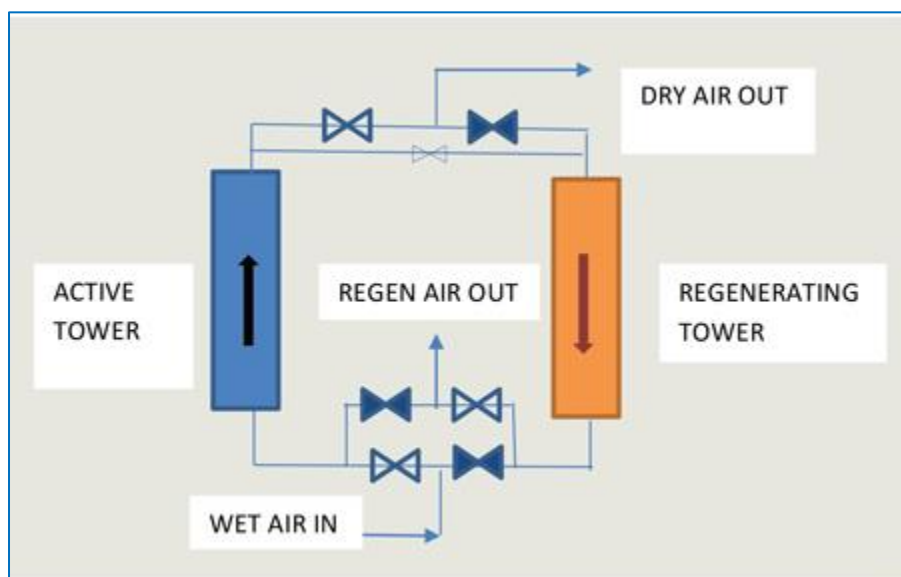




MU266: Air System (Instrument & Service Air) & Nitrogen

Training Description:

Oman India Fertilizer Company (Omifco), an India-Oman joint venture company, invested \$968m to build facilities with 1.65mt/yr. of urea and 350,000t/yr. of Surplus ammonia capacity. They are located at the Sur Industrial Estate, 150km South of Muscat, Oman.

OMIFCO owns and Operates:

- Ammonia: 2X 1750 MTPD (Licensor M/s Halder Topsoe)
- Urea: 2 x 2530 MTPD (Licensor M/s Snamprogetti)

The purpose of the service and instrument air system is to provide a continuous supply of compressed air of suitable quality and pressure for instruments, controls, and station use. Three centrifugal air compressors, one continuously operating with two normally in standby, maintain approximately 125 psig pressure. If system air header pressure drops, one of the standby air compressors automatically starts. If the air header pressure continues to drop, the second standby air compressor automatically starts. A connection off the common header opens when system pressure exceeds 95 psig to supply clean, oil-free service air to components throughout the plant. Should system pressure drop below 95 psig, an automatic isolation valve closes to shed these service air loads to preserve supply for the instrument air loads. The service air header also supplies breathing air stations. In parallel with the service air connection, an instrument air dryer removes moisture from the process flow. The instrument air system then supplies clean, dry, oil-free air for components throughout the plant. The instrument air system, using nitrogen supplied from the primary containment inerting system, supplies pneumatically controlled components, such as the safety relief valves and inboard main steam isolation valves, inside the drywell.

Training Objectives:

By the end of the training, participants will be able to:

- ✓ Recognize the major equipment's and their functions
- ✓ Learn how Air System & Nitrogen Plant Work
- ✓ Understand the Air System & Nitrogen Plant troubleshooting
- ✓ Recognize the Air & Nitrogen uses, Air & Nitrogen Hazard's and MSDS
- ✓ Gain the knowledges and informations needed for plant operations
- ✓ Review the operating parameters of:
 - Instrument Air & Its Quality
 - Air compressor & associated equipment
 - Compressor loading/unloading & Discharge control
 - Air drier operation & Sequence PLC
 - Analyzer for Air Quality
 - Nitrogen Cold box
 - Nitrogen Storage and Backup System
- ✓ Learn how Startup & Shut down.
- ✓ Understand the Nitrogen Plant troubleshooting
- ✓ Recognize the Nitrogen production & Associated equipment

Training Designed for:

This intensive course is intended for those Chemical Engineers, Operations Supervisors, Panel Operators and Field Operators.

Training Requirement:

"Hand's on practical sessions, equipment and software will be applied during the course if required and as per the client's request."

Contents can be adapted to your specific wishes. It is therefore possible to focus on specific modules of the training course as per client's learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

Training Program:

FIVE DAYS:

- ❖ PRE-TEST
- ❖ Introduction for Air System (Instruments / Service) and Nitrogen System
- ❖ The major parts of an instrument air supply system are:
 - The Electric motor
 - The Compressor (Compressor controls)
 - Components of compressed air system
 - Compressed air treatment
 - The Inlet Air Filter
 - The After Cooler
 - The Moisture Separator (Condensate control)
 - The Condensate Trap
 - The Air Receiver (Air quality)
 - The Safety Relief Valve
 - The Pressure Gauge
 - The Oil Remover
 - The Dryers
- ❖ The major parts of an instrument air supply system are:
 - Receivers
 - The Air Distribution System
- ❖ Air System Troubleshooting:
 - Instrument Air & Its Quality
 - Compressor loading/unloading & Discharge control
 - Air drier operation & Sequence PLC
 - Analyzer for Air Quality
 - Maintenance and servicing
 - Safety considerations
- ❖ Nitrogen Plant Equipment Types and their Function:
 - The purpose of the Nitrogen Unit and Process Description
 - How Do Nitrogen Generators Work
 - Major equipment's and their functions
- ❖ Warm End (W/E) Container
 - Compressor
 - Air receiver
 - Chiller (Heat exchanger)

- Pre-filter
- Air purification unit (APU), (TSA system)
- ❖ Cold box
 - Main heat exchanger
 - Distillation Column
 - Condenser
 - Expansion brake turbine
- ❖ Storage and Backup System
 - Liquid nitrogen tank
 - Vaporizer
- ❖ Nitrogen Plant Operation
 - How Nitrogen Plant Works
 - Nitrogen Hazards and MSDS
- ❖ Nitrogen Distribution (Common Uses of Nitrogen in industrial Plants)
 - Blanket gas to storage tanks
 - Blanket gas to expansion tanks
 - Seal gas to the compressors
 - Flare system stack and header purges
 - Pump purges
 - Instrument and electrical cable seal purges
 - Utilities Stations (Maintenance Use)
- ❖ Quality Control
 - Total Hydrocarbons
 - CO2 Monitoring
- ❖ Handling of Abnormal and Emergency Conditions
 - Control Narrative (Process Interlocks and trips)
 - Safeguarding System
 - Cause and Effect Matrix
- ❖ What Is Nitrogen Used for?
- ❖ Handling of Abnormal and Emergency Conditions
- ❖ Plant Emergency Causes:
 - Process Trips
 - Instruments Air Failure
 - Electrical Failure
- ❖ Defrost
 - Partial Defrost to remove CO2, water and Hydrocarbons
 - Total Defrost to allow prolonged outage
- ❖ Deriming Functions and Procedures, to be explained
- ❖ Course Conclusion
- ❖ POST-ASSESSMENT and EVALUATION

Training Certificate(s):

CMCT Internationally recognized certificate(s) will be issued to each participant who completed the course.

Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Gamification, Software & General Discussions
- Pre and Post Test

Training Fees:

TBA as per the course location - This rate includes participant's manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

Training Timings:

Daily Timings:

07:45 - 08:00	Morning Coffee / Tea
08:00 - 10:00	First Session
10:00 - 10:20	Recess (Coffee/Tea/Snacks)
10:20 - 12:20	Second Session
12:20 - 13:00	Recess (Prayer Break & Lunch)
13:00 - 14:00	Last Session

For training registrations or in-house enquiries, please contact:

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