



المركز الوطني للتدريب

NATIONAL TRAINING CENTER



OPERATIONS TRAINING

| Num | TITLE | TABLE OF CONTENT | OBJECTIVES | DURATION |
|-----------|------------------------------|---|---|---------------|
| UNIT P-01 | HYDROCARBON BEHAVIOUR | 1.0 Structure Of Matter. 2.0 States Of Matter . 3.0 Properties Of Liquids. 4.0 Properties Of Gases. 5.0 Changing State. 6.0 Heat. 7.0 Pressure. 8.0 Fluid Flow. 9.0 Reservoir Chemistry | <ul style="list-style-type: none"> ◆ Describe How Atoms, Molecules, And Compounds Relate To The Structure Of Hydrocarbons ◆ Identify The Various Properties Of Solids, Liquids, And Gases ◆ Show How Temperature Changes Affect Liquids ◆ Describe Heat Units, Types, And Methods Of Transfer ◆ Describe Units Of Pressure, And How Its Value May Be Calculated ◆ Describe The Flow Of Fluids In Pipes ◆ Describe The Chemical Properties Of An Oil Reservoir ◆ State The Common Alkanes In A Petroleum Reservoir And Identify Which Are Gases, Liquids And Solids At Standard Temperature And Pressure (STD) | 7 DAYS |



المركز الوطني للتدريب

NATIONAL TRAINING CENTER



OPERATIONS TRAINING

| | | | | |
|-------------------------|---|---|--|----------------------|
| <p>UNIT P-02</p> | <p>DRILLING AND SUBSURFACE EQUIPMENT</p> | <p>1.0 Drilling Terms And Equipment. 2.0 Casing System. 3.0 Types Of Casing/Tubing. 4.0 Blowout Control System. 5.0 Production Well Completion. 6.0 Tubing. 7.0 Wellhead. 8.0 Tubing Hanger. 9.0 Christmas Tree. 10.0 Perforating. 11.0 Well Control System.</p> | <ul style="list-style-type: none"> ◆ Identify The Parts Of A Drilling Rig And To Describe Their Function ◆ State Methods Of Blowout Prevention ◆ Describe The Equipment Necessary For Well Completion. ◆ Identify And Describe The Function Of Wellhead Equipment ◆ Describe Perforating Procedures ◆ Describe The Operation Of Well Control Equipment | <p>7 DAYS</p> |
| <p>UNIT P-03</p> | <p>READING PROCESS DRAWINGS</p> | <p>1.0 Symbols For Vessels, Pumps, Compressors & Tank. 2.0 Piping And Instrument Lines . 3.0 Symbols For Field Devices. 4.0 Instrument Symbols. 5.0 Computer Symbols. 6.0 Pipeline Designation. 7.0 Process Engineering Flow Scheme. 8.0 Utility Flow Scheme. 9.0 Eading Process Drawings</p> | <ul style="list-style-type: none"> ◆ Identify The Symbols And Acronyms Used For Plant Equipment And Instrumentation. ◆ Identify The Symbols Used For Piping And Instrument Signal Lines. ◆ State The Differences Between The Process Flow Scheme And Process Engineering Flow Schemes. ◆ Identify The Utilities Shown In A Utility Flow Scheme. | <p>7DAYS</p> |



المركز الوطني للتدريب

NATIONAL TRAINING CENTER



OPERATIONS TRAINING

| | | | | |
|----------------------------|----------------------------------|--|---|----------------------|
| <p>UNIT P-04-01</p> | <p>VALVES</p> | <p>1.0 Valve Construction. 2.0 Valve Components . 3.0 Valve Types. 4.0 Valve “Do’s” And “Don’ts”.</p> | <ul style="list-style-type: none"> ◆ Describe The Function Operation Of Isolation And Control Valves ◆ Identify The Major Parts Of Common Valves | <p>7 DAYS</p> |
| <p>UNIT P-04-02</p> | <p>PIPELINES</p> | <p>1.0 Piping System. 2.0 Types Of Pipe. 3.0 Methods Of Joining Pipework. 4.0 Methods Of Manufacturing Pipe. 5.0 Pipe Fittings. 6.0 Blinds. 7.0 Fabricating A Pipe System. 8.0 Pipe Leakage. 9.0 Pipe Hangers And Supports. 10.0 Tubing.</p> | <ul style="list-style-type: none"> ◆ List Parts Of A Pipe System. ◆ Demonstrate How Pipe Is Dimensioned. ◆ Describe Methods Of Manufacturing Pipe. ◆ List Types Of Common Pipe Fittings And State Their Use. ◆ List Types Of Common Pipe Hangers And State Their Use. ◆ Describe Methods Of Forming Pipework. | <p>7 DAYS</p> |
| <p>UNIT P-05-01</p> | <p>GRAVITY SEPARATION</p> | <p>1.0 Principles Of Separation. 2.0 Separator Construction. 3.0 Types Of Separators. 4.0 Stage Separation. 5.0 Scrubbers. 6.0 Vertical Cyclone Separator.</p> | <ul style="list-style-type: none"> ◆ Explain The Function Of Gravity Separation ◆ Explain The Principles Of Operation For Gravity Separation ◆ List The Physical Factors That Aid Gravity Separation ◆ Identify The Different Types Of Gravity Separators And Describe Different Services ◆ Identify The Major Differences Between | <p>DAYS</p> |



المركز الوطني للتدريب

NATIONAL TRAINING CENTER



OPERATIONS TRAINING

| | | | | |
|----------------------------|----------------------------|--|--|----------------------|
| <p>UNIT P-05-02</p> | <p>DISTILLATION</p> | <p>1.0 The Distillation Process. 2.0 Column. 3.0 Distillation Column. 4.0 Tray Columns. 5.0 Summary. 6.0 Packed Columns. 7.0 Heating / Cooling Equipment. 8.0 Overhead Product Condensing Equipment.</p> | <ul style="list-style-type: none"> ◆ Explain The Function Of Columns ◆ Explain The Principles Of Simple Distillation ◆ Identify The Different Types Of Columns And Describe Different Services. ◆ Identify The Major Differences Between Columns Fitted With Structured Packing, Random Packing & Distillation Trays ◆ Describe The Basic Construction Of A Column ◆ Describe The Internal Mechanisms In The Column And Identify Their Construction, Function And Principles Of Operation. ◆ Explain Basic Column Operation & Control ◆ Explain The Function Of Multi- Staged Distillation | <p>7 DAYS</p> |
| <p>UNIT P-05-03</p> | <p>STORAGE</p> | <p>1.0 Cone Roof Storage Tank (Fixed Roof Storage Tanks). 2.0 Cone Roof Tank Auxiliary Equipment. 3.0 Floating Roof Storage Tanks. 4.0 Dome Roof Storage Tanks. 5.0 Safe Tank Design And Operation. 6.0 Spheroid. 7.0 Spheres.</p> | <ul style="list-style-type: none"> ◆ Identify The Function Of Storage Tanks With Respect To Volatile And Non-Volatile Fluids Storage ◆ Identify Types Of Storage Tanks ◆ Describe The Basic Construction Of Different Types Of Storage Tanks. | <p>7 DAYS</p> |



المركز الوطني للتدريب

NATIONAL TRAINING CENTER



OPERATIONS TRAINING

| | | | | |
|------------------|------------------------|--|--|---------------|
| | | | <ul style="list-style-type: none"> ◆ Describe Storage Tank Auxiliary And Safety Equipment | |
| UNIT P-06 | HEAT EXCHANGERS | <p>1.0 Heat Exchanger Theory. 2.0 Heat Exchanger Applications. 3.0 Construction. 4.0 Heat Transfer Rates. 5.0 Co-Efficient Of Heat Conduction. 6.0 Type Of Flow. 7.0 Types Of Heat Exchangers. 8.0 Plate Type Heat Exchangers. 9.0 Air Cooled Heat Exchangers.</p> | <ul style="list-style-type: none"> ◆ State The Main Function Of A Heat Exchanger. ◆ State The Different Functions For A Heat Exchanger In This Industry. ◆ Name Different Types Of Heat Exchangers. ◆ Describe A Shell And Tube Heat Exchanger. ◆ State The Main Types Of Shell And Tube Heat Exchangers. ◆ Name The Main Parts Of A Shell And Tube Heat Exchanger. ◆ List Common Types Of Baffles. ◆ List Methods Of Attaching Tubes To Tube Sheets. ◆ State The Procedure For Pressure Testing A Heat Exchanger. ◆ Describe How To Start-Up And Shutdown A Heat Exchanger. | 7 DAYS |



المركز الوطني للتدريب

NATIONAL TRAINING CENTER



OPERATIONS TRAINING

| | | | | |
|--------------|-----------------|---|--|---------------|
| UNIT P-07 | PUMPS | 1.0 Centrifugal Pumps. 2.0 Operating Principles And Constructio. 3.0 Centrifugal Pump Construction. 4.0 Impeller Design. 5.0 Operating Pumps In Series And Parallel 6.0 Pump Start-Up Procedures. 7.0 Pump Changeover. 8.0 Pump Problems. 9.0 Pump Lubrication And Cooling. 10.0 Pump Control Systems. 11.0 Positive Displacement Pumps. 12.0 Diaphragm Pumps. 13.0 Pulsation Dampener. | <ul style="list-style-type: none"> ◆ Describe The Operating Principles And Identify The Major Parts Of A Centrifugal Pump ◆ State The Common Areas Of Wear And Failure In Centrifugal Pumps. ◆ Explain The Needs And Methods For Pump Lubrication. ◆ Describe What Is Meant By The Term Cavitation ◆ Identify The Different Types Of Positive Displacement Pumps, Their Main Parts And Describe Their Operation ◆ Explain The Basic Operating Principle Of A Rotary Pump ◆ Describe The Basic Types Of Rotary Pumps And Name Their Components ◆ List The Advantaged And Disadvantages Of Pumps Described In The Unit | 7 DAYS |
| UNIT P-08-01 | BEARINGS | 1.0 Bearing Functions. 2.0 Critical Speed. 3.0 Bearing Selection. 4.0 Bearing Classifications. 5.0 Plain Bearings. 6.0 Plain Bearing Materials. 7.0 Plain Bearing Lubrication. 8.0 Antifriction Bearings. | <ul style="list-style-type: none"> ◆ State The Functions Of Plain And Antifriction Bearings. ◆ Explain What Is Meant By The Terms Torsional Stress, Bending Stress And Axial Stress. ◆ State What Is Meant By A Machine's Critical Speed. | 7 DAYS |



المركز الوطني للتدريب

NATIONAL TRAINING CENTER



OPERATIONS TRAINING

| | | | | |
|----------------------------|---------------------------|---|---|----------------------|
| | | <p>9.0 Antifriction Thrust Bearings. 10.0 Bearing Faults.</p> | <ul style="list-style-type: none"> ◆ State Bearing Classifications. ◆ State What Journal, Thrust And Guide And Slipper Bearings Are Used For. ◆ State The Types Of Plain Journal And Plain Thrust Bearing. ◆ State The Types Of Plain Bearing Material. ◆ State The Advantages And Disadvantages Of Plain Bearings Compared To Antifriction Bearings. ◆ State The Method Of Lubrication For Plain Bearings. ◆ Explain The Operating Principles Of Antifriction Bearings. | |
| <p>UNIT P-08-02</p> | <p>LUBRICATION</p> | <p>1.0 Purpose & Function Of Lubrication. 2.0 Lubricant Types & Applications.</p> | <ul style="list-style-type: none"> ◆ State The Characteristics Of Oils And Greases. ◆ Identify And Describe Various Types Of Lubrication Methods. | <p>7 DAYS</p> |



المركز الوطني للتدريب

NATIONAL TRAINING CENTER



OPERATIONS TRAINING

| | | | | |
|----------------------------|---|---|---|----------------------|
| <p>UNIT P-08-03</p> | <p>COUPLINGS</p> | <p>1.0 Coupling Methods. 2.0 Couplings. 3.0 Rigid Coupling. 4.0 Flexible Couplings. 5.0 Fluid Couplings. 6.0 Hydrostatic Couplings. 7.0 Methods Of Joining And Securing Couplings To Shafts.</p> | <ul style="list-style-type: none"> ◆ State The Different Categories Of Couplings. ◆ Identify Various Types Of Coupling In Each Category, And Describe Their Application And Advantages. | <p>7 DAYS</p> |
| <p>UNIT P-09-01</p> | <p>INTERNAL COMBUSTION ENGINES</p> | <p>1.0 The Piston Engine. 2.0 The Upper Engine. 3.0 The Lower Engine. 4.0 The Four-Stroke Process. 5.0 The Valve-Timing System. 6.0 Two-Stroke Engines. 7.0 The Diesel Engine. 8.0 Natural Gas Engines. 9.0 The Fuel Induction System. 10.0 The Cooling System. 11.0 The Lubrication System. 12.0 The Exhaust System. 13.0 Anti-Pollution Devices. 14.0 Ignition System. 15.0 Engine Measurement.</p> | <ul style="list-style-type: none"> ◆ Name The Parts Of An Internal Combustion Engine And State Their Function. ◆ Describe And Identify The Parts Of The Supporting Systems Associated With An Internal Combustion Engine And State Their Function. | <p>7 DAYS</p> |
| <p>UNIT P-09-02</p> | <p>TURBINES</p> | <p>1.0 Fuel Supplies. 2.0 Jet Reaction . 3.0 The Working Cycle. 4.0 The Gas Turbine Principle. 5.0 The Working Cycle. 6.0 Velocity And Pressure Change. 7.0 Basic Starting Cycle. 8.0 Fuel Control. 9.0 Compressors</p> | <ul style="list-style-type: none"> ◆ Explain The Basic Terminology Used In Describing Turbine Operations. ◆ Explain The Functions And Classifications Of Turbines In Process Plants. ◆ Explain The Basic Principles Of Operation Of Gas Turbines | <p>7 DAYS</p> |



المركز الوطني للتدريب

NATIONAL TRAINING CENTER



OPERATIONS TRAINING

| | | | | |
|----------------------------|---|--|---|----------------------|
| <p>UNIT P-10-01</p> | <p>GAS COMPRESSION INTRODUCTION</p> | <p>1.0 Types Of Compressor. 2.0 Selection Of A Compressor. 3.0 Gas Condition. 4.0 Glossary.</p> | <ul style="list-style-type: none"> ◆ Describe The Principles Of Gas Compression, ◆ Describe The Function Of Gas Compressors, ◆ Define The Terms: Capacity, Free Air Delivery, Mass Flow Rate, Compression Ratio, ◆ Describe Different Compressor Groups, ◆ Describe The Compressor Selection Process, ◆ Understand The Importance Of Gas Condition. | <p>7 DAYS</p> |
| <p>UNIT P-10-02</p> | <p>POSITIVE DISPLACEMENT COMPRESSORS</p> | <p>1.0 Reciprocating Compressors. 2.0 Single Acting Reciprocating Compressors. 3.0 Double Acting Reciprocating Compressors. 4.0 Construction Of Piston Type Positive Displacement Compressors. 5.0 Field Applications. 6.0 Compressor Control. 7.0 Compressor Operation.</p> | <ul style="list-style-type: none"> ◆ Describe The Operation Of Single And Double Acting Piston Compressors ◆ Identify And Describe The Operation Of The Main Parts Of A Reciprocating Compressor. ◆ Explain The Function And Operation Of The Lubricating System. ◆ Explain The Function And Operation Of The Cooling System. ◆ Describe The Vent And Drain System ◆ Describe Methods Of Capacity Control ◆ Describe Start-Up, Shutdown And Normal Operating Tasks | <p>7 DAYS</p> |



المركز الوطني للتدريب

NATIONAL TRAINING CENTER



OPERATIONS TRAINING

| | | | | |
|---------------------|--|---|--|---------------|
| | | | <ul style="list-style-type: none"> ◆ Identify Troubleshooting Symptoms And Causes | |
| UNIT P-10-03 | CENTRIFUGAL AND AXIAL COMPRESSORS | 1.0 Centrifugal Compressor Theory. 2.0 Horizontally Split Casing. 3.0 Vertically Split Casing. 4.0 Compressor Lubrication. 5.0 Compressor Operating Curves. 6.0 Compressor Monitor And Protection Devices. 7.0 Axial Compressor Description. 8.0 Lube And Seal Oil System. | <ul style="list-style-type: none"> ◆ Describe The Operation Of A Centrifugal Compressor. ◆ List The Types Of Prime Movers That Are Used For Centrifugal Compressors. ◆ Name And Describe The Main Parts Of A Centrifugal Compressor ◆ Describe Methods Of Capacity Control Used On A Centrifugal Compressors ◆ Describe The Monitoring, Alarm And Shutdown Systems ◆ Identify The Main Parts And Describe The Construction Of An Axial Compressor ◆ Describe The Operating Principles Of An Axial Compressor ◆ Describe Surge And Stall Conditions | 7 DAYS |
| UNIT P-11 | GAS DEHYDRATION | 2.0 Water Content Of Natural Gas 2.1 Reservoir Conditions 2.2 Measuring The Water Content Of Gas 2.3 Dew Point 3.0 Gas Hydrates 3.1 Hydrate Formation 3.2 Methods Of Removing Hydrates 3.2.1 Hydrate Prevention | <ul style="list-style-type: none"> ◆ State Four Major Reasons For Removing Water From Gas Distribution Systems. ◆ State The Specification Of Water Content In Gas For The Transport Of Gas In Pipelines. ◆ Using The Correct Graph | 7 DAYS |



المركز الوطني للتدريب

NATIONAL TRAINING CENTER



OPERATIONS TRAINING

| | | | | |
|--|--|---|--|--|
| | | <p>4.0 Gas Dehydration Process</p> <p>4.1 Introduction</p> <p>4.1.1 The Process Of Absorption</p> <p>4.1.2 Absorption Systems</p> <p>4.2 Dewpoint Depression</p> <p>5.0 Gas Dehydration By Glycol Contacting</p> <p>5.1 Simple Description</p> <p>5.2 Detailed Description</p> <p>6.0 Glycol Regeneration System</p> <p>6.1 Detailed Description</p> <p>6.1.1 Rich Teg Flow</p> <p>6.1.2 Teg Flash Drum</p> <p>6.1.3 Teg Cartridge Filters</p> <p>6.1.4 Teg Carbon Filter</p> <p>6.1.5 Hot Lean / Rich Teg Exchanger</p> <p>6.1.6 Teg Still Column</p> <p>6.1.7 Teg Still Vent Cooler</p> <p>6.1.8 Teg Still Vent Ko Drum</p> <p>6.1.9 Teg Still Vent Condensate Pumps</p> <p>6.1.10 Lean Teg Flow</p> <p>6.1.11 Teg Stripping Column</p> <p>6.1.12 Teg Surge Drum.</p> <p>7.0 Gas Dehydration By Glycol Injection.</p> | <p>And Given The Gas Conditions Of Pressure And Temperature, Calculate The Water Content Of The Gas.</p> <ul style="list-style-type: none"> ◆ List The 3 Requirements For Hydrate Formation And Describe How Hydrates Are Produced And The Dangers Of Hydrate Formation. ◆ State Hydrate Removal / Prevention Methods. ◆ Identify 3 Types Of Glycol Used In Industry. ◆ Explain The Absorption Process. ◆ Describe The Process Of Absorption By Glycol Contacting. ◆ Describe The Normal Operating Parameters Of Level, Pressure, Temperature And Flow Within Injection And Inhibition System And Regeneration Process. ◆ Describe And List Routine Checks And Tasks On The Equipment. ◆ Explain Actions Required To Remedy Specific Equipment Problems. | |
|--|--|---|--|--|



المركز الوطني للتدريب

NATIONAL TRAINING CENTER



OPERATIONS TRAINING

| | | | | |
|----------------------------|--------------------------------------|---|---|----------------------|
| <p>UNIT P-12-01</p> | <p>MEASUREMENT PRINCIPLES</p> | <p>1.0 Describe Process Variables. 2.0 Identify And Describe Process Control Loops The Safety Barrier.</p> | <ul style="list-style-type: none"> ◆ Describe Equipment Used To Measure Process Variables. ◆ Identify The Control Loop Components And To Describe Their Function | <p>7 Days</p> |
| <p>UNIT P-12-02</p> | <p>VALVES AND ACTUATORS</p> | <p>1.0 Valve Types. 2.0 Actuators. 3.0 Valve Characteristics. 4.0 Emergency Shutdown Operations. 5.0 Conclusion</p> | <ul style="list-style-type: none"> ◆ Explain, With Diagrams, The Control Characteristics Of A Complete Control Valve Assembly. ◆ Explain, With Diagrams, The Terms „FAIL OPEN“, „FAIL CLOSE“. ◆ Explain, With Diagrams, The Causes And Effects Of Flashing And Cavitation. ◆ Describe, with the aid of a sketch, the following valve body types. <ul style="list-style-type: none"> - Gate - Globe - Butterfly - Pinch - Needle - Ball and Plug - Check Valve - Pressure Relief (Safety) Valve | <p>7 DAYS</p> |
| <p>UNIT P-12-03</p> | <p>CONTROL THEORY</p> | <p>2.0 Proportional Control Action 3.0 Integral (Reset) Control Action 4.0 Derivative (Rate) Control Action 4.1 Modern Dcs Controller 5.0 Ratio Control</p> | <ul style="list-style-type: none"> ◆ Describe The Use Of Proportional Control. ◆ Describe The Use Of Integral Control. ◆ Describe The Use Of | <p>7 DAYS</p> |



المركز الوطني للتدريب

NATIONAL TRAINING CENTER



OPERATIONS TRAINING

| | | | | |
|-------------------------|--------------------------------------|--|--|----------------------|
| | | <p>6.0 Cascade Control 7.0 Feed Forward Control 8.0 Multi-Variable Control 9.0 Adaptive Control 10.0 What Is Scada? 10.1 Definition Of Scada 10.2 Applicable Processes 10.3 Elements Of A Scada System 11.0 What Is Dcs? 11.1 The 5 Level Concept 11.2 Level Concept Description 1.0. Objectives/Introduction 2.0 Proportional Control Action 3.0 Integral (Reset) Control Action 4.0 Derivative (Rate) Control Action 4.1 Modern Dcs Controller 5.0 Ratio Control 6.0 Cascade Control 7.0 Feed Forward Control 8.0 Multi-Variable Control 9.0 Adaptive Control 10.0 What Is Scada? 10.1 Definition Of Scada 10.2 Applicable Processes 10.3 Elements Of A Scada System 11.0 What Is Dcs? 11.1 The 5 Level Concept 11.2 Level Concept Description.</p> | <p>Derivative Control. ♦ Describe The Use Of Combination (P Plus I Plus D) Control ♦ Describe The Use Of Cascade Control. ♦ Describe The Use Of Ratio Control. ♦ Describe The Use Of Feed-Forward Control. ♦ Describe The Use Of Adaptive Control. ♦ Describe The Use Of Multi-Variable Control. ♦ Describe A SCADA System ♦ Describe A DCS System</p> | |
| <p>UNIT P-13</p> | <p>OILFIELD CORROSION</p> | <p>1.0 Corrosion Theory . 2.0 Definition. 3.0 Corrosion In Gases. 4.0 Corrosion In Aqueous Solutions. 5.0 Formation Of An Electrode</p> | <p>♦ Define Corrosion ♦ Describe Corrosion By Galvanic Action ♦ Identify The Anode And Cathode Of Corrosion Cells</p> | <p>7 DAYS</p> |



المركز الوطني للتدريب

NATIONAL TRAINING CENTER



OPERATIONS TRAINING

| | | | | |
|---------------------|---|---|--|---------------|
| | | <p>Potential.</p> <p>6.0 Standard Electrode Potentials (Hydrogen Scale).</p> <p>7.0 Corrosion Prevention.</p> <p>8.0 Metallic Coatings.</p> <p>9.0 Non-Metallic Coatings.</p> <p>10.0 Chemical Injection Of Corrosion Inhibitors.</p> | <p>Formed By Two Metals In Contact</p> <ul style="list-style-type: none"> ◆ Define The Term Sacrificial Anode ◆ Describe The Use Of Sacrificial Anodes In The Prevention Of Corrosion ◆ Name The 3 Major Components In A Chemical Injection Package ◆ Identify And Name 2 Different Types Of Injection Points | |
| UNIT P-14-01 | PRINCIPLES AND USES OF REFRIGERATION | <p>1.0 Uses Of Refrigeration.</p> <p>2.0 Basic Refrigeration Principles.</p> <p>3.0 Refrigeration Cycle.</p> <p>4.0 Primary Refrigerants.</p> <p>5.0 Secondary Refrigerants.</p> | <ul style="list-style-type: none"> ◆ State The Applications Of Refrigeration In Industry, ◆ Define ‘Critical Temperature’ And ‘Critical Pressure’, ◆ Define The Term ‘Liquefaction’, ◆ Distinguish Between ‘Adiabatic’ And ‘Isothermal’ Expansion, ◆ Explain The Joule-Thomson Effect And State Its Relevance To Refrigeration. ◆ Explain The Industrial Vapour Compression System Of Refrigeration, ◆ Describe The Primary And Secondary Refrigerants, ◆ Describe The Components Of A Refrigerant System. | 7 Days |



المركز الوطني للتدريب

NATIONAL TRAINING CENTER



OPERATIONS TRAINING

| | | | | |
|---------------------|-----------------------------------|---|--|---------------|
| | | | <ul style="list-style-type: none"> ◆ Define The Terms 'Primary Refrigerant' And 'Secondary Refrigerant'. ◆ State The Desirable Properties Of Each Of The Above Groups Of Refrigerants. ◆ List Typical Refrigerants And Their Uses. | |
| UNIT P-14-02 | LIQUEFACTION | 1.0 Properties Of Gases. 2.0 Basic Concepts Of Liquefaction. 3.0 The Selection Of A Refrigerant. 4.0 Liquefaction Cycles. 5.0 End Flash System. | <ul style="list-style-type: none"> ◆ The Basic Concept Of Cooling And Liquefaction Of A Natural Gas Stream, ◆ The Selection Of A Refrigerant And Cooling Cycle, ◆ The Liquefaction Cycle. | 7 Days |
| UNIT P-15 | EMERGENCY SHUTDOWN SYSTEMS | 1.0 Esd System Construction. 2.0 Relays. 3.0 Relay Operation. 4.0 Solenoid Valves. 5.0 Esd System Description. 6.0 Logic Control Circuits | <ul style="list-style-type: none"> ◆ Identify Devices Used In Alarm And ESD And Describe How They Operate. ◆ Describe The Function Of An ESD System. | 7 Days |
| UNIT P-16 | EMERGENCY SHUTDOWN SYSTEMS | 1.0 Principles Of Induction. 2.0 Sine Wave. 3.0 Generator Rotor. 4.0 Single - Phase Voltage (1-Ph). 5.0 Three - Phase Voltage (3 - Ph). 6.0 Output Frequency. 7.0 Generator Excitation. 8.0 Air Cooling. 9.0 Hydrogen Cooling. 10.0 Cooling Auxiliary Systems. | <ul style="list-style-type: none"> ◆ Name The Basic Parts Of A Generator. ◆ Describe The Function Of Each Part In Inducing Voltage. ◆ Describe The Primary Difference Between A 1-Ph Generator And A 3-Ph Generator. ◆ Name Two Factors That | 7DAYS |



المركز الوطني للتدريب

NATIONAL TRAINING CENTER



OPERATIONS TRAINING

| | | | | |
|--|--|---|--|--|
| | | <p>11.0 Gas Purging. 12.0 Stator Cooling System. 13.0 Electrical Energy. 14.0 Power Stations</p> | <p>Determine The Frequency Of The Current Produced By A Generator.</p> <ul style="list-style-type: none"> ◆ Explain Why The Frequency Of A Generator’s Output Must Be Controlled. ◆ Explain The Function Of The Exciter In A Generator. ◆ Name The Parts Of A DC Exciter, And Describe Their Function. ◆ Name The Parts Of A Brushless Exciter, And Describe Their Function. ◆ Explain Why A Large Generator Is Typically Cooled With Hydrogen Instead Of Air. <ul style="list-style-type: none"> ◆ Explain How Carbon Dioxide And Air Are Used To Purge A Generator Cooling System. ◆ Describe The Flow Of Water In A Typical Stator Cooling System. ◆ Describe The Function Of Each Of The Following Components In A Typical Stator Cooling System: <ul style="list-style-type: none"> - Temperature Control Valve - Pressure Control Valve - Demineraliser | |
|--|--|---|--|--|



المركز الوطني للتدريب
NATIONAL TRAINING CENTER



OPERATIONS TRAINING