

Plant Operational, Inspection and Reliability Trainings (1/9)

The following additional classes can also be taught by TCR Arabia:

1. Piping and Valves, ASME Piping codes:

- Process Piping Fundamentals-Pipe sizing, layout, Design and Engineering
- Piping Design, Construction and Mechanical Integrity
- Understanding of ASME B 31.3 - Process Piping Code
- Understanding of ASME B 31.4 (Liquid Petroleum Transport Piping Code)
- Understanding and Application of Gas Piping Code: (ASME B 31.8)
- Pipe Stress Analysis, Flexibility and Pipe Supports
- Piping Code (ASME B 31.3) and Fitness For Service Assessment (API 579) for Plant Piping
- Piping and Valves: Design, Construction, Operation ,Protection and Integrity
- Selection, Operation & Maintenance of Valves, Best Practices
- Control & Safety Relief Valves: Operation, Selection and Troubleshooting
- Piping layout Engineering and Piping Isometrics
- CEASER-II. Pipe Stress Analysis, Expansion Joints and Supports selection
- Application of Piping Codes, Standards and Recommended practices
- Inspection of Pipelines and process piping systems

Plant Operational, Inspection and Reliability Trainings (2/9)

The following additional classes can also be taught by TCR Arabia:

2. Chemical Engineering, Refineries & Petrochemical Courses

- Distillation and Unit Operations, Control and Troubleshooting.
- Principles of Process Engineering
- Fluid Catalytic Cracking Units (FCCU) in Refineries
- Additives for Polyolefins: Their Importance and Functions.
- Chemical Engineering Basics (Unit Operations, process equipments: boiler, chiller, heat exchanger, distillation column; process plants and automation.
- Petroleum Refinery Engineering.
- Introduction to Refinery Processes.
- Plastics: Materials and Testing
- Process Equipment Sizing and Selection.
- Pilot Plant and Scale-up Studies.
- Distillation and Unit Operations, Control and Troubleshooting.
- Chemical Engineering Calculations
- Chemical Engineering and Technology for Non-Chemical Engineers

Plant Operational, Inspection and Reliability Trainings (3/9)

The following additional classes can also be taught by TCR Arabia:

3. Pressure Vessels Design, ASME Pressure Vessel Codes

- Awareness of ASME Codes.(Guided Tour of all ASME codes)
- Coded Pressure Vessel Design. (ASME Section VIII Division-1).
- Coded Design of Boilers and Heaters-ASME Sec.I
- Understanding Codes and Standards.
- Understanding ASME Pressure Vessel codes: ASME Sec.I. Sec.II, Sec V, Sec.VIII and sec. IX
- Shell and Tube Heat Exchangers Design, Operation, Control and Troubleshooting
- Design and Engineering of Shell and Tube Heat Exchangers
- Understanding and Application of ASME Section IX, (Welding Qualifications).

4. Plant Inspection and API courses

- Preparatory Course for API 510 Pressure Vessel Inspector Certification Examination
- Preparatory Course for API 570 Piping Inspector Certification Examination of Petroleum Refinery.

Plant Operational, Inspection and Reliability Trainings (4/9)

The following additional classes can also be taught by TCR Arabia:

4. Plant Inspection and API courses (Cont.)

- Preparatory Course for API 653 Storage Tank Inspector Certification Examination
- Preparatory Course for API 571 (Damage Mechanisms) Supplementary Certification
- API 579-Fitness For Service Assessments
- API 580/81 Risk Based Inspection.
- API 650 - Coded Design of Welded Steel Tanks for Bulk Storage.
- In-service and Shut-down Inspection of Petroleum Refinery.

5. Metallurgy and corrosion Engineering Courses

- Corrosion for Non-Corrosion Engineers
- Corrosion, Metallurgy and Prevention of Failure
- Selection of Metallic Materials, Metallurgical Principles and Applications
- Metallurgy for Non-Metallurgists
- Fundamentals of Materials science for Engineers
- Metallurgy of Steel (Basic)
- Metallurgy of Steel (Advanced)

Plant Operational, Inspection and Reliability Trainings (5/9)

The following additional classes can also be taught by TCR Arabia:

5. Metallurgy & corrosion Engineering Courses (Cont.)

- Metallurgy and Failure Analysis of Process Equipment and Piping
- Root Cause Failure Analysis & Reliability
- Selection of materials for Refinery and Petrochemical industries
- Corrosion Awareness Monitoring and Control
- Root Cause Failure Analysis & Reliability
- Corrosion and Cathodic Protection

6. Instrumentation, Control & Communications Courses

- HART Based Instrumentation and Control Field Devices
- Industrial Process Control and Instrumentation
- Automation Project Engineering (Instrumentation Symbols, P&ID, instrumentation documents, panel docs, project management, installation & commissioning, standards and practices)
- PLC Commissioning, Programming & Troubleshooting
- SCADA and Communication Standards (communication standards and protocols, SCADA concepts and features, alarms, trends, graphs, database connectivity)

Plant Operational, Inspection and Reliability Trainings (6/9)

The following additional classes can also be taught by TCR Arabia:

6. Instrumentation, Control & Communications Courses (Cont.)

- Advanced SCADA and communications for Water, Electricity and Process Industries
- Microcontroller based system design for Embedded applications
- Distributed Control System - DCS Design & Operation
- Measurement and Automatic Process Control
- Process dynamics and control
- UPS systems & battery chargers. (maint. & troubleshooting)
- Instrumentation and Controls for Boilers and Auxiliaries
- Instrumentation and Controls for Water and Waste-water treatment Plants

7. Welding Technology Courses

- Applied Welding Metallurgy.
- Applied Welding Technology.
- Welding in Pressure Vessels and Piping, Weld Inspection
- Understanding and Application of structural welding Code (AWS D 1.1)

Plant Operational, Inspection and Reliability Trainings (7/9)

The following additional classes can also be taught by TCR Arabia:

7. Welding Technology Courses (Cont.)

- Understanding and Application of ASME Section IX, (Welding Qualifications)
- Process Equipments: Fabrication and Heat Treatment
- Training and Qualifying Welders and Procedures
- Welding Technology and Welding practices in Fabrication Industry
- Welding Qualifications Code for Transportation Piping.(API 1104)
- Certified Welding Inspector: CWI, CSWIP

8. Water Treatment, Pollution Control Courses

- Water Treatment Plant Design, Theory and Practices (Ion Exchange and Reverse Osmosis)
- Boiler Feed Water Treatment Operations & Practices.
- The Troubleshooting and Preventive Maintenance of Ion Exchange and Reverse Osmosis Demineralization Plants
- Waste-water treatment in Process plants

Plant Operational, Inspection and Reliability Trainings (8/9)

The following additional classes can also be taught by TCR Arabia:

9. Pumps , Compressors , and other Rotating equipments

- Pumps and Compressors, Performance Curves, Testing Standards and Codes.
- Centrifugal and Reciprocating Compressors: Operation, Performance & Troubleshooting.
- Pumps: Operation, Maintenance and Troubleshooting..
- Pumps : Principles, Selection, Operation, Troubleshooting and Maintenance
- Selection and Sizing of Rotary Equipments (Pumps, Compressors, Motors and Gear Boxes)

10. Electrical Engineering Courses

- Testing of Electrical Power Equipment According to Standard Specifications.
- Design and operation of Electrical Substation.
- Selection, laying and fault finding of Electrical Cables
- Motors, Variable Speed Drives and Generators
- Selection, installation and Testing of Electric Transformers

Plant Operational, Inspection and Reliability Trainings (9/9)

The following additional classes can also be taught by TCR Arabia:

11. Training Courses in following topics are also arranged

- Safety Related Courses and Safety audits
- Construction and Project Management
- Site Management, Contract administration & Contract Closeout.
- Oil well Engineering, Drilling Technology
- Autocad and Design/Drafting
- Behavioral sciences, Banking skills, and related Courses
- Industrial Biotechnology & fermentation.
- Practical Mechanical Engineering for Industry

All courses, unless specified in advanced with the client, will be conducted at the training facility located at: **TCR Arabia Limited | Gas Gardens. King Abdulaziz Seaport, Dammam, Saudi Arabia**