Best Technology Soultions **(BTS)**

Training Program

Oil & Gas Production Equipment's Operation, Diagnostics & Maintenance

Introduction:

Pressure vessels, storage tanks, and piping systems together with rotating machinery for fluid transport represent major capital investment in any oil and gas production operation. Good fabrication of these components, based on rigorous material selection is likely to provide long service life of equipment. Material degradation and aging requires application of adequate diagnostic techniques and continuous monitoring. Regular monitoring and inspection techniques can help in providing basis for estimating the health of the existing components of the equipment as well as the overall risk assessment.

The delegates will be introduced to the main points of inspection and testing of storage tanks and piping systems according to the relevant API standards in order to perform the fitness for service (FFS) analysis. The most up-to-date methods of equipment protection methodologies will be presented together with maintenance activities, including necessary repairs as prevention of failures. The course will also cover methodology of the risk assessment and management regarding the overall equipment integrity. This course will include several courses with real problems from industrial practice which will enable discussions and exchange of experiences.

The course will feature:

- Diagnostics methods including inspection procedures
- Equipment maintenance best practices
- Safety in operation and maintenance of pressure stationary equipment and pipelines
- Efficient operation, diagnostics and maintenance of rotating equipment
- Material degradation, ageing, and modes of failure

Repair and revitalization technologies

Who Should Attend?

Reliability Engineers, Maintenance Managers, Engineers & Planners, Reliability and Maintenance Engineers, Facilities and Utilities Managers, Design Engineers, Top Level Maintenance Technicians, OE Champions, Predictive and Preventive Maintenance, Technicians & Supervisors, Planners, Maintenance Supervisors, Crafts and Tradesmen, Operations Supervisors, Process Engineers, Inspectors and Inspection Supervisors, Equipment Engineers Team Leaders and Professionals in Maintenance, Engineering and Production, Maintenance managers, reliability and maintenance Engineers, Production Managers, Plant Engineers, Design Engineers, Reliability Engineers and Technicians, Operators, Safety Engineers, Risk Engineers, Safety Engineers and anyone who is involved in Reliability Engineering strategies or methodologies to include design engineers for capital projects engineers, Foreman and Technicians, Mechanical, Electrical and Operational Personnel, Personnel designated as Planners, Key leaders from each maintenance craft, Key operations personnel, Technical professionals responsible for maintenance and repair of equipment, Professionals involved in inspection and maintenance and repair, professionals involved in asset & maintenance management auditing, Quality & Compliance Managers, Lead Auditors & Audit Team Members, Process Controllers, Maintenance Supervisors, Maintenance Planners, Predictive Maintenance Technicians & Supervisors, Materials Management Managers and Supervisors, Service Company Representatives, Asset owners & Asset Managers

Course Objectives:

By the end of this course delegates will be able to:

- Apply diagnostics and inspection procedures to pressure equipment

- Analyze results of condition monitoring and vibration control of rotating equipment
- Follow the requirements of industry inspection standards and practices
- Identify elements of safety of pressure vessels, storage tanks and pipelines
- Plan and manage activities related to maintenance and repair

Course Outline:

Stationary Equipment: Technical Characteristics & Operational Safety

- Above ground storage tanks: operation & safety
- Pressure vessels, heat exchangers and steam boilers
- Pipelines & piping systems: operation & safety
- Pressure relief valves: selection & sizing
- ASME BPV VIII & ASME B31.3 Standards and API Inspection Codes

Rotating Equipment: Operation, Efficiency & Safety

- Centrifugal pumps: Maintaining NPSH and Prevention of Cavitation
- Reciprocating & rotary pumps
- Centrifugal compressors: Anti-surge control and Choke conditions
- Reciprocating & rotary compressors
- Safety issues, troubleshooting and problem solving of rotating equipment

Diagnostics of Equipment Failure & Root Cause Analysis

- Material degradation & failures of stationary & rotating Equipment
- Failure modes, effects and diagnostics analysis (FMEDA)
- Diagnostics of fatigue, cracks, &ruptures: Fitness For Service (FFS) Analysis
- Root cause analysis (RCA) of failures
- Risk Management & Mitigation Technologies: ALARP criteria

Inspection, Monitoring & Mechanical Integrity Evaluation

- Risk Based Inspection (RBI API 580) for stationary pressure equipment (NDT)
- Pipeline internal and external corrosion direct assessment (ICDA & ECFA) methods
- Pigging of complex onshore and offshore pipelines
- Rotating machinery condition monitoring
- Vibration analysis including rotor balancing, shaft alignment techniques

Maintenance & Repairs Organization & Management

- Storage tanks: external & internal maintenance techniques
- Cathodic protection of pipelines and storage tanks
- Coating & thermal protection
- Repair technologies