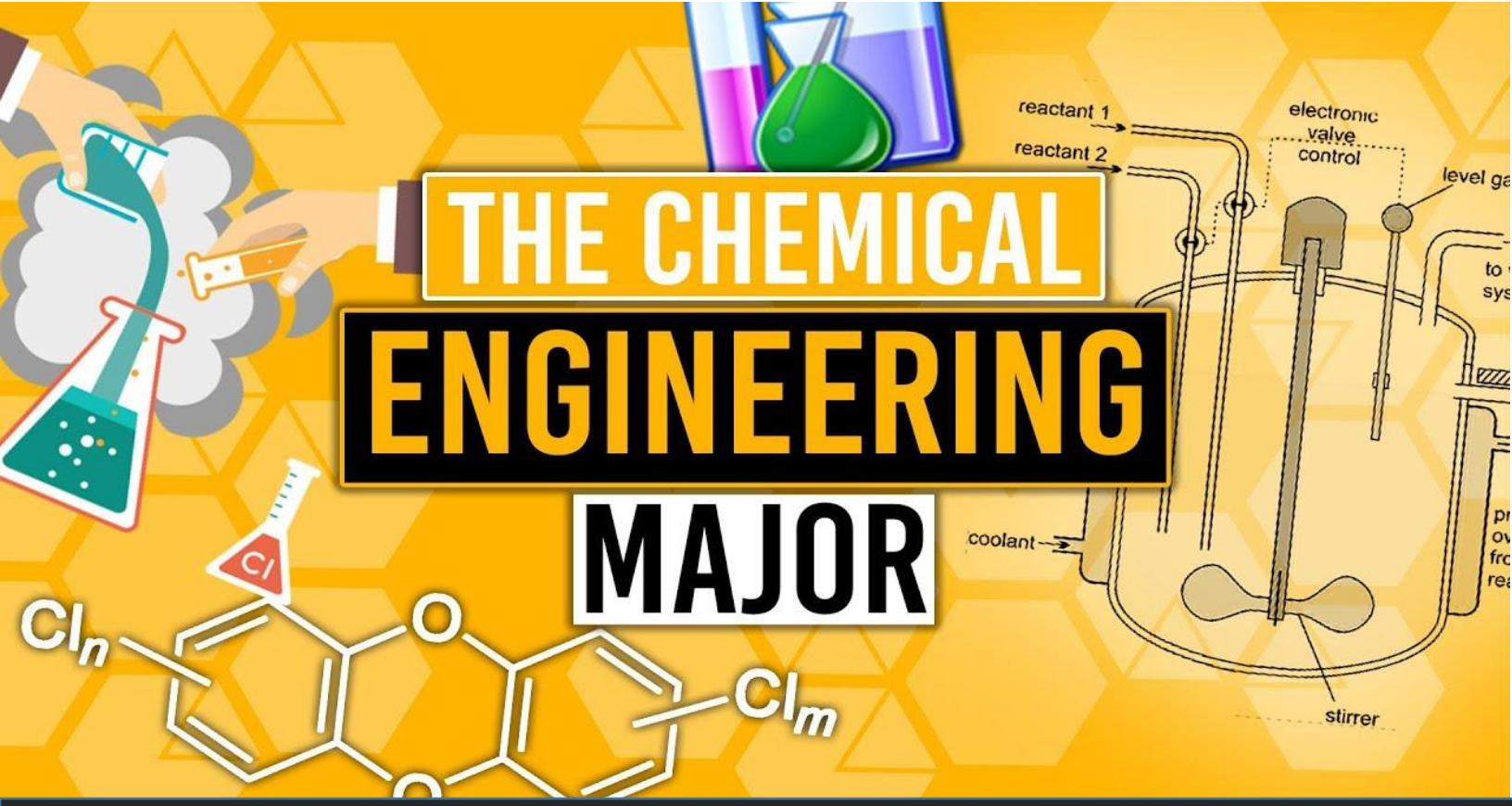

Corrosion Control in the Oil & Gas and Process Industries

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Corrosion Control in the Oil & Gas and Process Industries

Introduction:

The annual losses due to corrosion and the cost of rectification run to several billion dollars in oil & gas exploration industries around the world. High production under aggressive and extreme operational conditions necessitates the development of new materials which also have peculiar failure behaviors. Thus the industry operators are on continuous perusal with different corrosion management strategies. Yet unforeseen failures of top-side, sub-surface and sub-sea infrastructure due to corrosion not only entails in loss of production but loss of life as well. Prediction of failure behaviors, remaining useful life, corrosion preventive measures are all approaches in corrosion management for safe and economic operation of production wells and other facilities. The successful corrosion management influences the economic outcome of the company by ensuring cost effective selection of materials, chemical treatments, coatings, cathodic protection systems and appropriate designs.

Who Should Attend?

Corrosion Control Engineers & Personnel, Process Engineers, Metallurgists, Inspection Personnel, Mechanical Engineers, Material Selection Personnel, Plant Contractors, Operations Engineers, Team Leaders & Supervisors, Maintenance Engineers, Maintenance

Supervisors, Senior Plant Supervisors, Mechanical Engineers, Corrosion Control & Monitoring Systems Personnel, Equipment Engineers, Maintenance Engineers and Planners, Team Leaders, Managers & Coordinators, Construction Coordinators, Technologists, Safety Officers, Maintenance Team Leaders & Engineers, Design Engineers, Service Company Representatives, Oil and Gas Production Facilities Personnel, Chemists, Chemical Engineers, Inspectors and Inspection Engineers & Supervisors, Technicians and Supervisors, Environmental Specialists, New Petroleum Engineers, Asset Management Personnel, Construction Engineers, Refinery Chemists, Chemical Engineers, Personnel who are / will be responsible for detecting, inspecting, monitoring, controlling corrosion in oil and gas piping, pipelines used in production operations and Personnel responsible for metallurgy, corrosion or the prevention of failures in plant and equipment.

Course Objectives:

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

- The causes and control of corrosion in oil and gas production and processing
- An overview of what corrosion is
- What the major corrosion issues are in upstream oil and gas operations
- Understanding how materials corrode
- What techniques are used to monitor corrosion
- Basic corrosion control fundamentals
- Inhibitors and how they work
- Corrosion monitoring in field applications and cathodic protection

- Basic skills and understanding to control and solve corrosion issues

Course Outline:

Oil & Gas Production Fluid

- Origin and production of oil & gas
- Chemical compositions of production fluids
- Oilfield equipment
- Overview of oilfield processes & operations

Metallurgy

- Chemical properties of metals
- Mechanical properties
- Alloying elements
- Cooling of metals
- Crystalline forms of metals
- Metal defects
- UNS numbers
- Properties of common oilfield metals & alloys
- Metallurgy of oilfield equipment

Corrosion Damage

- Corrosion fundamentals
- Common forms of corrosion
- Corrosion monitoring in plant and facilities
- Non-Destructive Testing (NDT)
- Corrosion failure & root cause analysis

Oilfield-Specific Corrosion: Internal Corrosion

- Water corrosion

- Sour corrosion
- Sweet corrosion
- Oxygen corrosion
- Top of line corrosion (TLC)
- Microbiologically induced corrosion (MIC)
- Sand erosion

Oilfield-Specific Corrosion: External Corrosion

- Atmospheric corrosion
- Corrosion under insulation (CUI)
- Corrosion of pipe flanges
- Underground corrosion
- Stray current corrosion
- Seawater corrosion
- Oilfield equipment corrosion

Corrosion Prevention & Control Measures

- Corrosion control by operations
- Corrosion control by processes
- Corrosion control design
- Corrosion control by material selection

Cathodic Protection (CPS) Systems

- Cathodic protection fundamentals
- Galvanic anodes CPS
- Impressed current CPS
- CPS system maintenance

Barrier Film (Coatings and Lining)

- Coating fundamentals
- Performance characteristics of industrial coatings
- Types of coating systems
- Surface preparations

- Coating applications
- Coating defects

Chemical Treatment

- Corrosion inhibitors
- Performance evaluation of corrosion inhibitor
- Application of corrosion inhibitors

Biocide Treatment

- Microbiologically influenced corrosion (MIC)
- Sulphate-reducing bacteria
- Biocide selection & treatment

Non-Metallic Materials

- Polymers
- Composite materials

Corrosion Management Strategy (CMS)

- Corrosion management of oilfield equipment
- Corrosion economy
- Corrosion key performance indicators (KPIs)
- Asset integrity and corrosion management
- Codes & standards
- Corrosion data management