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COURSE BROCHURE

CO2 and H2S Corrosion Control for Upstream Assets Training Course

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Registered in the United Kingdom and Saudi Arabia

CO2 and H2S Corrosion Control for Upstream Assets Training Course

CO2 and H2S corrosion control for upstream assets is a 1-week training course for integrity, maintenance and corrosion engineers who protect wells, flowlines, separators and pipelines from sweet and sour attack, and it ends with a corrosion control plan for one production system. Rising water cuts, souring reservoirs and ageing carbon steel make internal corrosion a leading cause of leaks and deferred output. Jupiter Prime Training runs this course for engineers who keep those assets in service.

Why CO2 and H2S Corrosion Control Matters Now

Three forces sharpen the focus on corrosion in upstream assets: mature fields producing more water and carbon dioxide, reservoirs that sour as injection water feeds sulphate-reducing bacteria, and operators who stretch carbon steel facilities beyond their original design life. A company that selects materials, inhibitors and monitoring wisely avoids leaks, unplanned shutdowns and replacement spend; one that relies on corrosion allowance alone faces failures that harm people and the environment. The course draws on cathodic protection practice supported by the Association for Materials Protection and Performance AMPP and on recognised industry guidance for sour service materials.

Who Gains Most from CO2 and H2S Corrosion Control

- Integrity engineers who rank threats and set inspection intervals for wells and pipelines
- Corrosion engineers who specify inhibitors, coatings and cathodic protection systems
- Maintenance engineers who repair or replace corroded piping and vessels
- Production chemists who manage injection rates and fluid sampling
- Materials engineers who approve steels and alloys for sour duty

Asset integrity groups gain most when corrosion, maintenance and production chemistry staff from one field attend together and agree a shared barrier strategy.

CO2 and H2S Corrosion Control Capabilities

Participants learn to read produced fluid chemistry as a corrosion forecast, then choose the barriers that keep metal loss within limits.

- Assess CO2 corrosion rates from partial pressure, temperature and flow — corrosion allowance decisions
- Specify materials for sour service against cracking risks — materials approval panels
- Design inhibitor injection and availability targets — production chemistry and operations
- Apply coating and cathodic protection choices to buried and submerged assets — pipeline owners
- Build a monitoring scheme with coupons, probes and inspection — integrity reviews
- Communicate corrosion risk ranking to asset managers — maintenance budgets

Key CO2 and H2S Corrosion Control Terms

- Sweet corrosion — metal loss caused by carbon dioxide dissolved in produced water forming carbonic acid on steel surfaces.
- Sour corrosion — attack driven by hydrogen sulphide, producing iron sulphide scales and hydrogen that can crack susceptible steels.
- Sulphide stress cracking — brittle fracture of high-strength steel under tensile stress in wet hydrogen sulphide environments.
- Corrosion inhibitor — a chemical added to produced fluids that forms a protective film and slows metal loss.
- Cathodic protection — a method that makes steel the cathode of an electrochemical cell to stop external corrosion.
- Microbiologically influenced corrosion — corrosion accelerated by bacteria such as sulphate reducers living in water-wet deposits.

CO2 and H2S Corrosion Control Day by Day

Day 1: Corrosion Threats in Upstream Assets

- Electrochemistry of Steel in Produced Water — Anodes, Cathodes and Electrolytes
- Produced Fluid Chemistry — Water Cut, Chlorides, Bicarbonates and Organic Acids
- Threat Mapping from Wellhead to Export — Ranking Systems by Consequence
- Failure Case Histories from Oil and Gas Fields — Leak Causes and Costs
- Corrosion Allowance Philosophy — Design Life Versus Active Barriers

Day 2: Sweet and Sour Mechanisms

- CO2 Corrosion Prediction Models — Partial Pressure, Temperature and pH Effects
- Flow Effects and Erosion-Corrosion — Velocity Limits and Sand Production
- H2S Attack and Iron Sulphide Films — Protective Versus Pitting Behaviour
- Sulphide Stress Cracking and Hydrogen-Induced Cracking — Susceptible Steels
- Microbiologically Influenced Corrosion — Sampling and Biocide Choices

Day 3: Materials and Chemical Barriers

- Carbon Steel, Clad and Corrosion-Resistant Alloys — Life-Cycle Cost Selection
- Sour Service Material Limits — Hardness, Welding and Qualification Checks
- Corrosion Inhibitor Selection — Laboratory Testing and Field Trials
- Inhibitor Injection Systems — Dosage, Availability and Distribution
- Oxygen Scavengers and Biocides for Water Injection — Chemical Programme Interfaces

Day 4: Coatings, Cathodic Protection and Monitoring

- Internal and External Coatings — Surface Preparation and Holiday Testing
- Sacrificial Anode Cathodic Protection — Offshore Structures and Short Pipelines
- Impressed Current Systems — Rectifiers, Groundbeds and Potential Surveys
- Coupons, Probes and Intelligent Pigging — Choosing Monitoring Methods
- Corrosion Data Trending — Key Performance Indicators for Integrity Reviews

Day 5: Practising the Corrosion Control Plan

- Fluid Chemistry and Threat Ranking for a Production System — Applying Days 1 and 2
- Material and Inhibitor Selection — Applying Day 3
- Cathodic Protection and Monitoring Scheme — Applying Day 4
- Inspection Intervals and Response Triggers — Linking Data to Maintenance
- Corrosion Control Plan — Barriers, Responsibilities and Review Cycle

Applying CO2 and H2S Corrosion Control After the Course

- Recalculate predicted CO2 corrosion rates for one flowline using current water cut and pressure, and compare them with coupon and inspection data.
- Audit inhibitor availability records for a production system and agree corrective actions with operations where dosing falls short of target.

CO2 and H2S Corrosion Control Questions FAQ

What is CO2 and H2S corrosion control and why does it matter now?

CO2 and H2S corrosion control is the selection of materials, chemicals, coatings and monitoring that limit sweet and sour attack in upstream assets. It matters now because mature fields produce more water and gas contaminants, raising leak risk in ageing steel.

Which roles gain most from CO2 and H2S corrosion control training?

Integrity, corrosion and maintenance engineers gain most. Production chemists and materials engineers also benefit, because they manage inhibitor programmes and approve steels whose performance depends on the same fluid chemistry.

How does CO2 and H2S corrosion control differ from a corrosion management systems course?

CO2 and H2S corrosion control focuses on mechanisms and technical barriers in upstream equipment. Corrosion management systems courses address organisation-wide processes, risk registers and performance governance, while this course concentrates on chemistry, materials, inhibitors, cathodic protection and monitoring choices.

What do you bring back from CO2 and H2S corrosion control training?

You bring back a corrosion control plan for a production system. It records fluid chemistry, threat ranking, chosen materials and inhibitors, cathodic protection, monitoring points, inspection intervals and response triggers.

CO2 and H2S Corrosion Control: The Way Forward

The corrosion control plan first informs whether a flowline or vessel can stay in carbon steel with inhibition or needs an alloy or liner. Integrity, maintenance and production staff use it to schedule monitoring and repairs. After its first use, revisit the threat ranking as water cut and souring change, because fluid chemistry drifts faster than design assumptions.