CORROLEUM CONSULTING

Training Course Overview:
Internal Corrosion and Prevention in Oil and Gas Production

Corroleum Consulting offers training on internal corrosion for the upstream oil and gas industry. An overview of the complete 4-day corrosion course modules and a summary of the content is provided below. The course content and modules taught can be modified to meet the requirements of the client and are available online (Teams) or in person. Learning will be assessed via multiple choice tests on sections 1-10.

Module 1. Introduction

- Consequences of corrosion
- Corrosion cell
- Corrosion rate units
- Factors that affect corrosion rate
- Corrosion processes
  - Sweet - CO_2
  - Sour - H_2S
  - Oxygen

Module 2. Forms of Corrosion

- Uniform (general)
- Localised
  - Pitting, Crevice & Under deposit
- Galvanic
- Preferential weld corrosion
- Flow assisted corrosion
  - Erosion corrosion & Cavitation
- Microbiologically Influenced Corrosion (MIC)
- Top of line corrosion (TLC)
- Environmental Cracking
  - Stress corrosion cracking
  - Hydrogen damage

Module 3. Corrosion Control

Brief overview of the following control techniques:

- Engineering design
- Operating Techniques
- Coatings
- Cathodic protection
- Plastic pipes
- Metallurgy

Module 4. Corrosion Control: H_2S and Oxygen Removal

- H_2S Scavengers / H_2S removal
  - Liquid scavengers – chemistry
  - Liquid scavengers – testing
  - Liquid scavengers – application
- Amine units
- H_2S adsorbents
- Oxygen removal
  - Oxygen scavengers
  - Dearation towers

Module 5. Corrosion Control: Bacteria Treatments

- Introduction to microbiology
- Microbiology influenced corrosion (MIC)
- Biocides
  - Chemistry
  - Mechanism of kill
  - Application
- Nitrate treatments

Module 6. Oil and Gas Corrosion Inhibitors

- Anodic inhibitors
- Cathodic inhibitors
- Organic / film forming corrosion inhibitors
  - Composition of corrosion inhibitors
  - Corrosion inhibitor chemistry
  - Inhibitor intensifiers / synergists
  - Environmentally acceptable (green) corrosion inhibitors
  - Environmental regulations
  - Inhibitor formulating process
  - Corrosion inhibitor physical properties
  - Classification of corrosion inhibitors
  - Field conditions that affect inhibitor performance

Module 7. Corrosion Inhibitor Testing

- Wheel Test
- Kettle Test
- Rotating Cylinder Electrode Test (RCE)
- Static autoclave
- HT/HP Autoclave
- Jet Impingement
- Flow loop
- Top of line corrosion
- Secondary property inhibitor testing

Module 8. Corrosion Inhibitor Application

- Continuous Injection
- Batch Treatment
- Squeeze Treatment
- Downhole injection
  - Capillary string
  - Gas lift injection
  - Annulus injection
  - Tubing displacement
  - Batch and fall
- Pipeline application
- Cooling / heating water applications

Module 9. Corrosion Inhibitor Field Trial & Corrosion Monitoring

- Introduction
  - Corrosion monitoring objectives
  - Corrosion monitoring technique considerations
- Corrosion monitoring techniques
  - Corrosion probes
  - Corrosion coupons
  - Corrosion side stream
  - Ultrasonic testing (UT)
- Chemical analysis
  - Iron & manganese counts
  - Corrosion Inhibitor residuals
- Inspection
- Bacteria monitoring
- Corrosion Field Survey
  - Aims
  - Data Collection
  - Field survey report

Module 10. Corrosion In Oil And Gas Systems

- Overview of corrosion in the following locations
  - Oil wells
  - Gas wells
  - Pipelines (oil and gas)
  - Surface / topsides equipment
  - Produced water injection
  - Amine units
  - Casing / Annular corrosion
  - Injection equipment
  - Hydrostatic testing
  - Seawater injection systems

Module 11. Corrosion Prediction

- Corrosion prediction exercise using freely available models

Who Should Attend

This corrosion course is designed for a broad audience of professionals, particularly those in the early stages of their careers. Individuals working within the following oil and gas disciplines will benefit most greatly from this course:

- Corrosion engineers
- Asset integrity engineers
- Pipeline engineers
- Students studying corrosion at post graduate level
- Production chemists
- Corrosion chemists
- Chemical treatment specialists



About the Instructor – Alyn Jenkins



Alyn Jenkins is a highly regarded specialist in corrosion within the oil and gas sector. With 27 years of experience, Alyn has worked at Clariant Oil Services and Baker Hughes before spending two decades at SLB as the Asset Integrity Advisor, focusing on corrosion prevention projects across the global oil and gas sector.

Alyn's area of expertise is internal corrosion control in the upstream oil and gas industry including chemical treatments (corrosion inhibitors, biocides and H_2S scavengers), corrosion monitoring, chemical testing and bacteria testing. He has Bachelors and Master's degrees in chemistry, and a Post Graduate Certificate in Renewable Energy Engineering.

Alyn is an active member of SPE and AMPP, having chaired numerous conferences and workshops. He received the NACE Technical Achievement Award in 2019 and became an AMPP Fellow in 2024. Alyn has authored 65 technical papers on corrosion control, bacteria testing, scale control, deepwater chemicals, sustainability, and renewable energy, and has filed 17 patent applications.

Contact Details

For more details or to discuss a course and pricing, please contact:

Alyn Jenkins
alyn@corroleum.com
+44 7872 838466
www.corroleum.com