

CORROSION UNDER INSULATION (CUI) DETECTION AND PREVENTION

“Combat the Hidden Threat—Master the Strategies to Detect, Assess, and Prevent Corrosion Under Insulation.”

Schedule

Venue (InHouse)	Fees
At Your Organization Premises	Ask For The Quotation

► **Available delivery methods:** In-House Training

Introduction

Corrosion Under Insulation (CUI) is one of the most challenging and costly integrity issues affecting industrial facilities across oil & gas, petrochemicals, power generation, and marine sectors. This in-depth course equips participants with the practical knowledge and tools to identify early signs of CUI, assess risk areas, implement inspection protocols, and apply effective preventive measures. Participants will explore insulation systems, water ingress mechanisms, coating solutions, and best practices for long-term CUI control.

Objectives

By the end of this course, participants will be able to:

- Understand the root causes, mechanisms, and environments leading to CUI
- Identify high-risk zones and common CUI indicators
- Implement effective inspection and monitoring strategies
- Evaluate insulation and jacketing materials for CUI resistance
- Apply mitigation and prevention methods aligned with international standards

Why Attend

CUI often remains undetected until catastrophic failure occurs. This course helps you build a proactive integrity approach, reduce operational risk, and optimize maintenance spending by addressing CUI before it escalates.

Target Audience

- Corrosion, Integrity, and Inspection Engineers
- Maintenance and Coating Specialists
- Mechanical and Reliability Engineers
- Plant Managers and Technical Supervisors
- Asset Integrity and QA/QC Professionals
- Anyone responsible for piping, vessels, and thermal systems with insulation

Individual Benefits

- Gain advanced understanding of CUI risks and detection
- Learn to select appropriate insulation and coating systems
- Enhance your confidence in inspection planning and failure prevention
- Improve decision-making in repair, replacement, or re-insulation

Organizational Benefits

- Reduce unplanned downtime due to unexpected corrosion failures
- Minimize costs associated with reactive maintenance and insulation removal
- Ensure compliance with safety and asset integrity standards
- Extend the operational life of insulated equipment

Instructional Methodology

- Visual presentations with case studies and damage photos
- Practical group exercises on risk ranking and inspection prioritization
- Videos and animations demonstrating moisture ingress and corrosion progression
- Interactive problem-solving workshops and quizzes
- Real-world examples from refineries, offshore, and chemical plants

Course Outline

DETAILED 5-DAY COURSE OUTLINE (CUSTOMIZABLE)

Training Hours: 7:30 AM – 3:30 PM **Daily Format:** 3–4 Learning Modules | Coffee Breaks: 09:30 & 11:15 | Lunch Buffet: 01:00 – 02:00

Day 1: Understanding CUI and Its Impact

- Module 1: Fundamentals of Corrosion & Insulation Systems (07:30 – 09:30)
- Module 2: Mechanisms and Types of CUI (Carbon Steel, Stainless Steel, etc.) (09:45 – 11:15)
- Module 3: Common Industry Failures and Incident Analysis (11:30 – 01:00)
- Module 4: Standards Overview – API 583, NACE SP0198, ISO 19277 (02:00 – 03:30)

Day 2: Materials and Risk Factors

- Module 1: Insulation Types – Calcium Silicate, Mineral Wool, Aerogels (07:30 – 09:30)
- Module 2: Jacketing Systems and Design Considerations (09:45 – 11:15)
- Module 3: Coating Systems and Application under Insulation (11:30 – 01:00)
- Module 4: Operating Temperature Effects and Water Intrusion Paths (02:00 – 03:30)

Day 3: Detection and Inspection Techniques

- Module 1: CUI Risk-Based Inspection (RBI) & Criticality Ranking (07:30 – 09:30)
- Module 2: NDT Techniques – UT, RT, IR Thermography, Guided Waves (09:45 – 11:15)
- Module 3: Visual Inspection, Corrosion Mapping & Access Challenges (11:30 – 01:00)
- Module 4: Data Interpretation and Monitoring Strategies (02:00 – 03:30)

Day 4: Prevention and Mitigation Strategies

- Module 1: Insulation & Coating Material Selection for CUI Resistance (07:30 – 09:30)
- Module 2: Maintenance Planning & Inspection Intervals (09:45 – 11:15)
- Module 3: Design Modifications for Drainage & Drying (11:30 – 01:00)
- Module 4: Case Study: Implementing a CUI Mitigation Program (02:00 – 03:30)

Day 5: Best Practices and Program Implementation

- Module 1: Documentation and CUI Inspection Planning Templates (07:30 – 09:30)
- Module 2: Repair vs. Replacement – Decision-Making Guidelines (09:45 – 11:15)
- Module 3: Long-Term CUI Strategy Development (11:30 – 01:00)
- Module 4: Final Exam, Certification Wrap-Up & Action Planning (02:00 – 03:30)

Certification

Upon successful participation and assessment, delegates will receive a Certificate of Completion – Corrosion Under Insulation (CUI) Detection and Prevention, verifying their knowledge of global best practices and mitigation strategies as outlined by API, ISO, and NACE.

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