

Cathodic Protection (CP) Design For Pipelines And Storage Tanks



Why: The Cathodic Protection (CP) course is offered as a 2-day course that covers corrosion principles and CP concepts as they apply to pipelines and storage tanks. This course addresses the identification and mitigation of corrosion on buried piping systems. Course topics include corrosion basics, corrosion mechanisms, CP concepts, CP criteria, CP design principles, CP design examples, monitoring CP systems, and CP measurement techniques. This course utilizes a combination of theory and practical information and is designed to provide in depth coverage of CP used in the pipeline and storage tank industries.

Pipeline, storage tank, utility, and consulting engineers, inspectors and other technical individuals with the responsibility of corrosion control on pipelines and storage tanks.

What: The objective of this course is for each student to understand the basic fundamentals of corrosion and cathodic protection, corrosion control methods, and field testing procedures, so the student will have a technical foundation on which to build corrosion expertise. The course is designed to provide the student with knowledge of CP system design, operation, and maintenance and help the student understand, analyze, and develop CP problem-solving techniques. The course will also provide design calculations with examples using a computer application.

Instructor: Bruce H. Ellis, P.E.

- Senior Project Engineer /Corrosion Engineer with RK&K
- Registered Corrosion Engineer
- NACE Certified Cathodic Protection Specialist
- NACE Certified Corrosion Specialist
- NACE Certified Coatings Specialist
- Committee chairman of STG-05 Technical Group for CP

Mr. Ellis was RK&K's Lead Corrosion Engineer for the Stray Current Analysis, City of Lexington, NC. Mr. Ellis was tasked to perform a stray current analysis for the City's main transmission natural gas pipeline. One section of the City's pipeline was in the voltage gradient of a TRANSCO impressed current groundbed and another section of the pipeline had interference where it crossed two major petroleum

pipelines that are under impressed current CP. Mr. Ellis performed surveys and located the areas of stray current pick-up and discharge. He also designed the method of mitigation to resolve the stray current problems.

Mr. Ellis has over 20 years of key level experience directing multifaceted project operations for oil, petroleum and water industries. He has specialized in corrosion control, coatings and cathodic protection with extensive experience in the design, construction, and implementation of corrosion control methods. He has extensive knowledge of DOT, NACE, AWWA and Federal/State guidelines.

He has served as Lead Corrosion Engineer for the following projects:

Raz-Gas in Doha, State of Qatar
Exxon/Mobile Pipeline in Baton Rouge, LA for ECDA project of 4.3 miles of coated pipeline.
City of Houston in compiling complete specification for Above Grade Crossings at rivers, bayou's and storm crossings for in-situ encapsulation in lieu of repainting.

Corrosion Authority for jobs pertaining to high soluble salts and chloride attack on bridge decking in an around Denver Metro area.

Mr. Ellis has been involved with SWMPTAC (Steel Water Pipe Technical Advisory Committee) which developed coatings for AWWA.

Prior to working for RK&K, Mr. Ellis performed as the General Manager and Lead Corrosion Engineer for Global Cathodic Protection in Houston, Tx, Vice President of Operations for FERA Corp, Senior Corrosion Engineer for East Bay Municipal Utility District in Oakland, CA, and a Corrosion Supervisor for the Board of Water Commissions in Denver, CO.

Where: Technical Toolboxes
3801 Kirby Dr. #501
Houston, TX 77098

Price: \$1,295.00 per student

2 day course on cathodic protection (CP) design for pipelines and storage tanks

Day 1:

Corrosion Basics

- Corrosion as an Electrochemical Process
- Driving Force
- The Electrochemical Cell
- Components of the Electrochemical Cell
- Reactions in an Electrochemical Cell

- The Electrochemical Basis for Cathodic Protection

CP Concepts

- Potentials Required for Cathodic Protection
- Practical Application of Cathodic Protection
- When Cathodic Protection Should Be Considered
- Functional Requirements for Cathodic Protection
- Continuity
- Electrolyte
- Source of Current
- Connection to Structure
- Sacrificial Anode Systems
- Impressed Current Systems

Criteria for CP

CP Design Principles

- CP Fundamentals
- General Design Procedures
- Drawings and Specifications
- Choice of Sacrificial or Impressed Current System
- Basic Design Procedure for Sacrificial Anode Systems
- Basic Design Procedure for Impressed Current Systems
- Total Current Determination
- Total Resistance Determination
- Voltage and Rectifier Determination
- Analysis of Design Factors
- Determination of Field Data

Day 2:

CP Design Examples

- Pipelines
- Tanks

Monitoring CP Systems

- Required Periodic Monitoring and Maintenance
- System Data
- Design Potentials
- Current Output
- System Settings and Potential Readings
- Rectifier Instructions
- Basic Maintenance Requirements
- Guidance for Maintenance
- Agency Maintenance and Operations Manuals
- DOT Regulations
- NACE Standards

Instrumentation used in CP evaluation

Measurement Techniques



Please complete the attached form and fax to TTI at 713-630-0560

Course Cost: \$1295.00 per student

Course Date:

Name

Company

Address

Address

City, State, ZIP

Country

Phone/Mobile

Fax

E-mail

Payment by Credit Card

Circle One: VISA MasterCard AMEX

CC Number

Expiration Date

Signature*

*** By signing above I commit to paying the course fee when invoiced**

Terms and Conditions: One registration is required per person. Upon receipt of your above registration, an invoice will be generated for payment. Payment is due 30 days from receipt of invoice. Full price of the course fee will be refunded provided written cancellation is received 3 weeks prior to course date. A cancellation after the deadline will receive full credit towards a future date for the same course..

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