

# € TRAINING

Design and Maintenance of Cathodic  
Protection System



# Design and Maintenance of Cathodic Protection System

## Introduction:

Maintaining the aging infrastructure such as underground pipelines is a challenge to the oil and gas industry worldwide. Understanding why and how cathodic protection works or fails can help the operator formulate appropriate strategy in managing the pipeline corrosion problems. This five-day course covers both the fundamentals and practices in designing, operating, and maintaining cathodic protection of underground pipelines. An overview of the NACE standard on "Pipeline External Corrosion Direct Assessment Methodology" will also be presented.

## Course Objectives:

At the end of this course the participants will be able to:

- Drawing a simple model of a Cathodic Protection cell and name the different elements.
- Naming 2 types of Cathodic Protection Systems design.
- Explaining the relationship between Coatings and Cathodic protection.
- Naming and describing 2 different testing methods used to test Cathodic Protection.
- Understanding terminology commonly used when discussing Cathodic Protection.

## Targeted Audience:

- Designers and anyone who is interested in cathodic protection technology for corrosion prevention.
- Facility owners and users who are concerned with corrosion.
- Technicians and maintenance personnel.
- Engineers and technologists.

## Course Outlines:

### Unit 1:

- Primer on Chemistry and Metallurgy.
- Fundamentals of corrosion.
- Cathodic Protection.
- Sacrificial Anode Cathodic Protection.
- Impressed Current Cathodic Protection.
- Criteria for Cathodic Protection.
- Reference potential devices.

## Unit 2:

- Potential measuring instrument.
- Soil resistivity test instruments.
- Wall thickness and pit gages.
- Current interrupters.
- Test rectifiers.
- Holiday detectors.

## Unit 3:

- Electrical resistivity.
- The resistance of the ground connection.
- Non-uniform electrolyte.
- Grounded Design.
- Long pipelines and pipe insulating joints.
- Stray current corrosion and electrolysis.
- Practical stray current problems.

## Unit 4:

- Interference from other CP installations.
- Effectiveness of coatings.
- Coatings specification.
- Coatings inspection.
- Type of pipeline coatings.
- Coating failures and analysis.

## Unit 5:

- Cathodic Protection and Coatings.
- Survey methods for the pipeline not under cathodic protection.
- Survey methods for the pipeline under cathodic protection.
- Overview of NACE Standard on "Pipeline External Corrosion Direct Assessment Methodology".
- Corrosion Inhibitors.
- Scale Inhibitors.
- Biocides.