



External Corrosion Direct Assessment (ECDA) For Onshore Pipeline Integrity

External Corrosion Direct Assessment (ECDA) is a structured process to evaluate buried onshore ferrous pipeline integrity. The ECDA goal is to enhance safety by managing the risk of pipeline corrosion failures while minimizing the cost required for excavations and repairs. ECDA may also be used when more established methods such as in-line inspection (ILI) and pressure testing are not possible or practical.

VELOSI offers pipeline operators a comprehensive approach to all four stages of the ECDA process. Our techniques are based on state-of-the-art experience of industry best practices and an extensive corrosion database. In all our operations, our goal is to deliver the highest levels of confidence achievable with the fewest number of digs – for a more thorough understanding of your pipeline's integrity. You have the flexibility to choose only those service areas of specific interest to you, or to utilize our expertise for the entire process. These ECDA services execute the complex requirements identified in NACE RP 0502, simplifying the entire process and yielding results which help to ensure pipeline safety and prolong asset life.

Service Overview

We combine the in-field and analytical experience of our NACE-certified corrosion professionals with advanced data-integration, visualization capabilities and innovative inspection technologies to achieve highly reproducible results in each of the following areas:

Pre-Assessment

Combining a pipeline's physical characteristics, operating history and prior inspections. Pre-assessment is the first step in the ECDA process. All pertinent historical information is compiled, falling generally into five categories:

- Pipe data
- Construction data
- Soil/environmental conditions
- Corrosion protection data
- Operating parameters/history

Indirect Assessment

The purpose of indirect inspection is to identify the locations of coating faults, insufficient cathodic protection, electrical shorts, interference, geologic current shielding, and other anomalies along the pipeline. The technique also defines areas where corrosion may be occurring or has occurred. Typical pipeline survey techniques that may be used are:

- Close-interval, on/off potential surveys
- DCVG surveys
- Electromagnetic current attenuation surveys
- Alternating current voltage gradient surveys

Direct Examination

Exposing the pipe for verification of the above-the-ground surveys results and physical inspection of pipe coating, pipe surface and soil electrolyte. Direct examination includes:

- Ranking and prioritizing indications identified during the indirect inspections
- Excavating to expose the pipe and collecting data where corrosion activity is most likely
- Measuring coating damage and corrosion defects
- Performing a root-cause analysis
- Evaluating the process

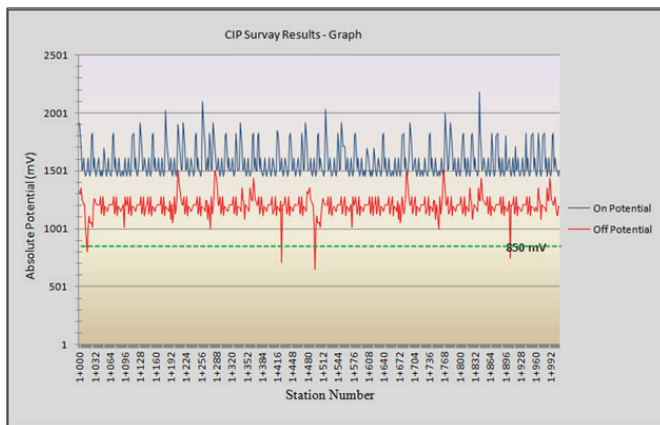
Post Assessment

Integration of the results gathered in tier 1, 2, & 3 for overall integrity assessment, validation of the ECDA process and determination of the interval period to re-do the ECDA process. Post-assessment can determine the overall effectiveness of direct assessment and define reassessment intervals. Reassessment intervals are based on remaining-life calculations. Various methods can be used to calculate the remaining life - from the corrosion growth rate, wall thickness, calculated failure pressure, yield pressure, maximum allowable operating pressure, and appropriate safety margin. Under some conditions, corrosion rates can be estimated by measuring linear polarization resistance or using coupons.

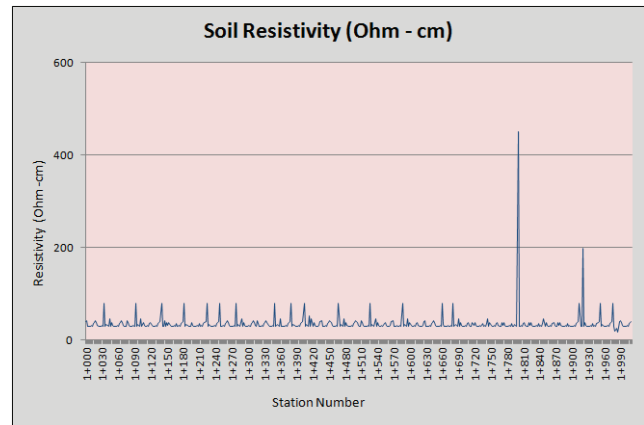
Key features

- NACE-certified corrosion professionals and engineers perform all activities, from pre-assessment region design to definition of post-assessment re-inspection intervals, effectiveness and reporting
- Integrated engineering and in-field data alignment reduce project cycle time and increase correlation confidence
- Rigorous ECDA region definition more quickly identifies project feasibility, contributing to lower cost/higher value solutions
- Extensive modeling experience and advanced statistical algorithms produce more rapid detection of complex interactions among features
- Excavation site selection - based on proven statistically sound practices, - controls validation costs and maximizes assessment effectiveness
- Decades of corrosion growth-rate experience affords more realistic remaining life predictions
- Staff corrosion engineers are able to immediately engineer and install optimal remediation solutions based on best practices
- Thorough written documentation is provided for all stages – for internal operator use and to satisfy regulatory compliance requirements

VAIL–Pipeline Software tool for ECDA: Screen shots



Integrated CIPS/DCVG Survey Results



Soil Resistivity Survey with "Indication" of Suspect Coating Holiday