PRODUCT APPLICATION NOTE

PIPELINE & GAS DISTRIBUTION NETWORKS

AC Corrosion Protector

Key Indicator Assessment of an AC corrosion case

The presence of adjacent high voltage AC power transmission systems leads to AC coupling which could adversely affect a pipeline. The below conditions indicate a higher likelihood of an induced AC problem.

- Power transmission systems that operate at 69 kV or greater.
- Pipeline/AC power systems/ AC Railway that are co-located for 2,5 km or more.
- Pipeline/AC power systems/ AC Railway with a lateral separation of 150m or less.
- Current density greater than 100 A/m^2 indicates a high risk of AC corrosion, while current density between 20 and 100 A/m^2 indicates a medium risk, and current density less than 20 A/m^2 suggests a low risk.

To overcome the damaging effects of AC currents, the current needs to be mitigated.

Mitigation of AC potentials to values below 15 Volts may not be sufficient with respect to AC current densities at the coating holidays.

By adding AC pipe-to-soil potential testing to annual cathodic protection system evaluations pipeline operators can more quckly uncover these contributing factors and mitigate their risk.

Testing will help identify areas where safety or personnel hazards exist.

This same data, when coupled with soil resistance information, will also help identify areas of elevated AC current density with a direct correlation to the potential for AC-related corrosion.

Mitigating induced alternating currents

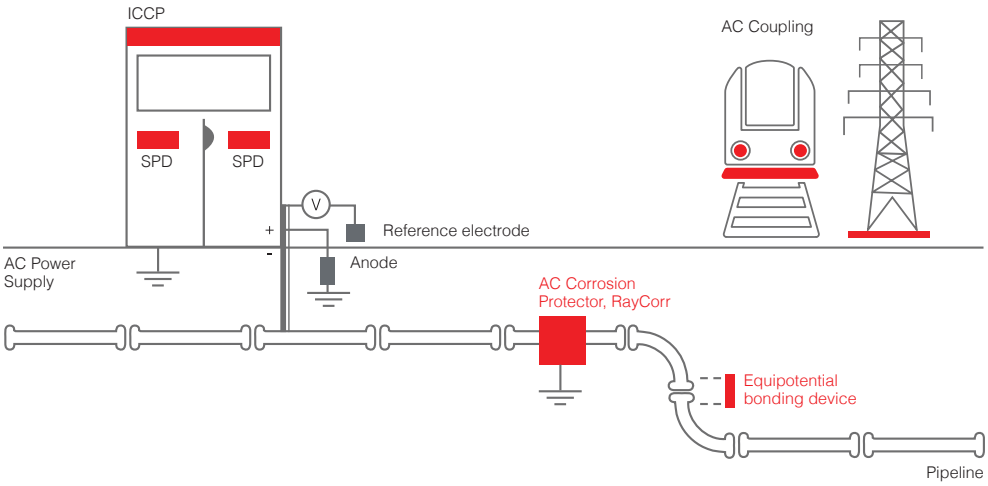
Personnel safety and system protection

The AC voltage induced to the metal pipe reverses the current flow in the installed Cathodic Corrosion Protection System (CCPS).

Corrosion will start if the AC current is not mitigated to ground, without influencing the DC current flow of the CCPS.

Corrosion rates in the presence of AC are:

- Increased in chloride containing or de-aerated environments
- Increased with decreasing AC frequency (under 100 Hz)
- Increased with decreasing holiday surface area
- Decreased with increasing CP current density and time



Pipeline Cathodic Protection System

Pipeline Anti-Corrosion System Protective Device

The RayCorr device is installed between metallic pipeline and ground, eliminating the AC voltages induced from the overhead power lines to the pipeline. AC coupling devices, placed at various locations along the pipeline, divert induced alternating currents to ground while blocking the direct currents of the Corroison Protection. In this case AC voltage induced to the metal pipe does not reverse the current flow in the installed CCPS and corrosion doesn't start.

In addition, it protects the pipeline and the anti-corrosion system from lightning.

RayCorr incorporates a Surge Protective Device (SPD), which diverts the lightning current to the earth, and an appropriate AC filter.

- Protects pipeline anti-corrosion system against induced overvoltages
- Diverts AC currents of up to 40 Arms
- Impulse Current Discharge capability up to 100kA, 10/350µs
- Maintenance free

RayCorr R-S-16

Raycap is a trusted partner, providing maintenance-free electrical protection solutions for mission-critical applications in hundreds of thousand installations worldwide. For a detailed presentation on how Raycap's solutions can protect your gas field equipment, contact us today!

Raycap

www.raycap.com

G29-00-268 170127