



A 'current' affair: Preserving our pipes with cathodic protection

Prevention is a critical component of pipeline safety. At Enbridge, we focus heavily on prevention measures to keep our pipeline network healthy, as well as fit for service, and identify potential issues before they arise.

One of those important prevention measures is cathodic protection—the application of a DC current—to curb external corrosion on our crude oil and natural gas pipes.

Q: What is cathodic protection?

Cathodic protection is the application of DC current to control corrosion on a pipeline by making the pipeline a cathode of an electrochemical cell. The pipeline is protected by connecting it to a metal (anode) that corrodes to produce the current required to protect the pipeline.

Q: How does this process fit with your overall prevention program?

Cathodic protection is an important element of Enbridge's aggressive corrosion prevention program – which also includes a robust atmospheric and internal corrosion prevention programs. Monitoring and maintenance of these prevention programs is achieved by various means, which include inline inspections (using state-of-the-art pipeline inspection tools), vigorous pipeline maintenance operations, remotely controlling isolation valves, and a 24/7 pipeline monitoring system using trained staff and state-of-the-art-technology.

Over the past three years, through 2019, we've invested more than US\$3.7 billion (C\$4.8 billion) on programs that help us maintain the fitness of our systems.



Enbridge personnel need infrequent but regular access to cathodic protection posts along our pipeline rights-of-way for inspection and maintenance.

For landowners

Enbridge's cathodic protection program provides another level of security with respect to the safe operation of our pipelines.

As part of this program, Enbridge personnel will need infrequent but regular access to cathodic protection posts along our pipeline rights-of-way for inspection and maintenance.

As an ongoing measure of respect for Enbridge's adjacent landowners, we will notify you in advance of any such visit.

Anti-corrosion allies

The effectiveness of our integrity program is bolstered by other measures that address potential internal and external corrosion.

The products we transport must meet rigorous quality specifications (outlined in tariff reports). Regular monitoring of product quality is done to ensure the product quality meets the required specifications to minimize internal corrosion.

We also protect pipeline sections exposed to the atmosphere through the application of high-performance protective paints/coatings, while applying fusion-bonded epoxy to new buried pipe segments.

'Inside' information

To confirm that our cathodic protection systems are working as intended, we monitor their effectiveness through analysis of collected performance data. Additionally, we run inline metal loss inspection tools through our pipelines to measure cathodic protection system effectiveness, along with other non-routine specialized field assessments, to identify:

- A scenario diverting current from its natural path, and interfering with cathodic protection requirements.
- The adverse influence of an adjacent pipeline's cathodic protection system.
- Physical contact with another metal object, which can adversely affect protection levels on the line.
- Alternating Current (AC)-induced corrosion, which can occur in utility corridors that contain high-voltage power lines.

