

Cathodic Protection

One of the methods TransCanada uses to ensure the safety and integrity of its pipeline systems is a technology called cathodic protection.

Commonly used across various industries to prevent the corrosion of metal structures such as bridges, tanks, steel-pier piles and offshore oil platforms, cathodic protection is also used for pipelines as it provides an additional layer of protection.

Oil and natural gas pipelines are normally well-coated to prevent external corrosion. However, the coating may have defects called “holidays” where the bare steel is exposed to soil or water. Cathodic protection is a Direct Current (DC) that goes to these holidays causing reactions between the steel and the environment, which greatly reduces the corrosion rate. The DC current can come from a piece of metal in the soil such as Magnesium or Zinc connected to the steel. This method moves the corrosion from the pipeline to the piece of metal called a “sacrificial anode” because it corrodes and is sacrificed to keep the pipeline steel intact.

Another method is to use an electrical power source to impress a DC current onto anodes in contact with the soil that is common with the pipeline. These are called “Impressed Current Cathodic Protection Systems (ICCP)” systems.

This proven technology has been utilized in the protection of steel pipelines for more than 60 years. In fact, cathodic protection is so effective that it is now required as a standard pipeline protective safety measure.

Design Considerations

Some of the considerations for a cathodic protection system design include:

- Length of pipeline to be protected
- Type and thickness of the pipeline coating
- Soil characteristics including:
 - Type of soil (i.e. sand, clay, loam)
 - Corrosive nature of soil
 - Soil resistance to passage of electrical current
- Water table characteristics
- Parallel routing and proximity to other buried pipelines, facilities, and high-voltage electric transmission lines.

These factors help determine the design of the cathodic protection system. The system is then designed, built and maintained to achieve industry standards to better protect the pipeline.

The effectiveness of the cathodic protection system is measured using specialized devices that monitor the performance of the system. Access points to the pipeline are approximately every two to three kilometres (one to two miles) and are typically installed at public road and railroad crossings, and at crossings with other pipelines when approved by the owner of the other pipeline.

On the Energy East Pipeline

On the portion of existing pipeline that will be converted to oil transport, the existing Impressed Current Cathodic Protection System will be used to protect the pipeline. For new pipeline construction not adjacent to existing pipelines, new cathodic protection facilities will be installed.

Energy East Pipeline



Contact us

We encourage your input and invite interested stakeholders to contact us.

1.855.895.8750 (Toll-free)

EnergyEast@TransCanada.com

EnergyEastPipeline.com

