

about pipelines corrosion



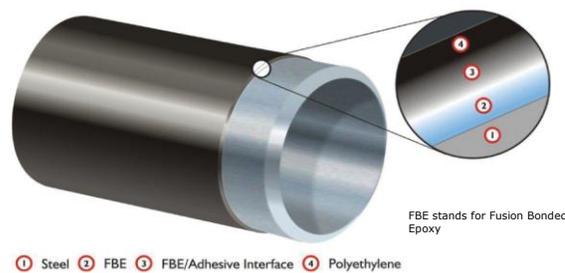
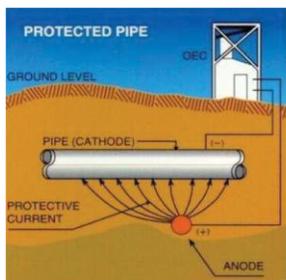
What is corrosion? Corrosion is a naturally occurring phenomenon which happens when metal reacts with the environment, such as water or soil. If you think of a chain that's been left out in the rain, over time that chain will develop rust and start to corrode. Pipelines are no different. Over time and without protection, pipelines can corrode as well.



So how do we protect our pipelines? There are two main ways to protect our pipelines. The first involves applying a coating to the pipeline when it's being manufactured. The most common type of coating is an **epoxy coating**, which is a paint-like substance that seals the steel surface of the pipeline. The epoxy interferes with corrosion mechanisms affecting the pipeline. In the field, other specific types of coatings are also used to prevent corrosion. Often these coatings are case-specific, depending on the situation. For example, a special type of cement coating is used in river crossings to weigh the pipe down and also protect against mechanical damage during installation.

"Corrosion is significantly mitigated when pipelines are properly monitored and protected."

Ziad Saad
Vice President,
Safety & Sustainability.



Source: Images courtesy of Kinder Morgan Canada and Shaw Pipe

Another way to protect the pipeline is through the use of cathodic protection. **Cathodic protection** is a technique used to control the corrosion of a metal surface by using another piece of metal to draw corrosion away from the pipe through the use of a carefully calibrated electrical current.

A combination of metal, water and air is necessary for corrosion to occur. While external corrosion is more prevalent than internal corrosion on transmission pipelines, failures are extremely rare.

This is due, in part, to rigorous maintenance practices. Internal corrosion is also rare because the product in the pipeline is always flowing and frequently cleaned with scrapers.



Source: Image courtesy of Kinder Morgan Canada

Scrapers can look like large wire brushes that rotate, as they go through the pipeline. This helps to clean the pipe and prevent any build-up of material. In some cases, a corrosion inhibitor, a chemical substance used to prevent corrosion from taking place, is used.

What are some of the tools used to monitor corrosion? Even though failures, due to pipeline corrosion, are very rare, our pipeline operators continuously monitor their pipelines with different technology and tools. Some of these tools include things like smart pigs and visual inspections. **Smart pigs**, which stands for pipeline inspection gauge, are large metal devices that look like a plunger. They're inserted into the pipeline and pushed along by the force of the product flowing through the pipeline. These smart pigs measure several different things from inside the pipeline, such as, restrictions and deformations in the pipe, as well as metal loss. If metal loss is detected, then the pipeline operator will take action, which in some cases may include replacing a section of the pipe with brand new pipe.



Source: Image courtesy of BJ Pipeline Inspection



Source: Image courtesy of BJ Pipeline Inspection

Although it's important to have the tools in-place to identify potential issues on the pipeline, **visual inspections** are also important. Pipeline field personnel walk the right-of-way looking for clues, such as pooling of oil or changes in the environment. Planes and helicopters can also give the pipeline operators a birds-eye view of what's happening on the ground, as well.

If any of these clues are discovered, then the pipeline operators will act quickly to investigate the situation and repair the affected pipe.

With the proper protection and monitoring, pipeline operators, in the vast majority of cases, are able to identify and mitigate any potential issues long before a leak or a failure occurs.



For more information on corrosion, please visit these websites...

Canadian Energy Pipeline Association – www.aboutpipelines.com

National Association of Corrosion Engineering – www.nace.org

American Society of Mechanical Engineers – www.asme.org

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