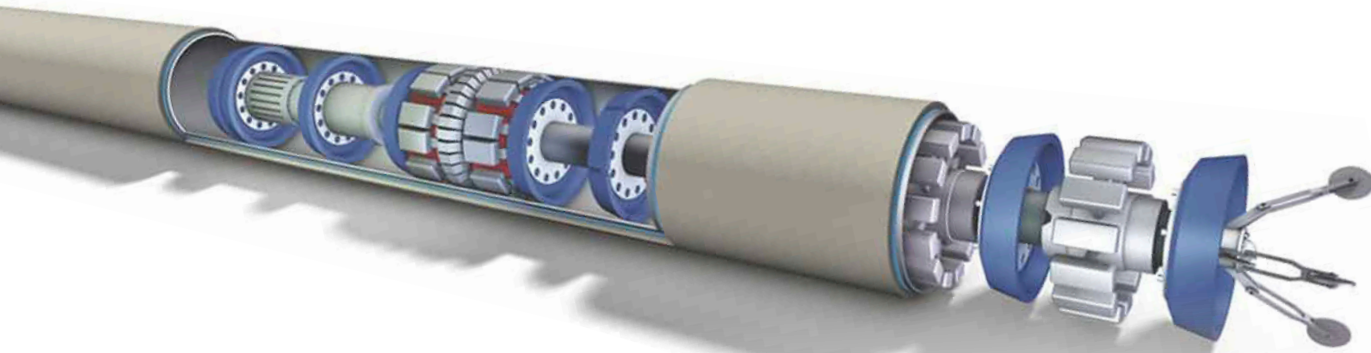


## IN-LINE INSPECTION TOOLS

Safety is our first priority in every phase of construction, operation and maintenance of our assets. Our comprehensive pipeline integrity program includes the use of sophisticated in-line inspection tools to assess the integrity of existing pipelines, clean pipelines of debris, and inspect pipelines before commissioning. Performing preventative maintenance through the use of in-line inspection tools allows us to detect and resolve any potential anomalies within the pipelines before they become a problem.



### WHAT ARE IN-LINE INSPECTION TOOLS?

In-line inspection tools, or “Smart Pigs,” are electronic tools that travel through pipelines using magnetic sensors to detect irregularities that may indicate corrosion, gouges, cracks or other defects. Using the Smart Pigs, we can identify anomalies and perform preventative maintenance before an incident occurs, making the tools an invaluable asset to our safety program. This proactive measure greatly reduces the probability of a reactive response.

### HOW DO THEY WORK?

Smart Pigs are inserted into the pipeline at a valve site or pump station where the flow of product within the pipeline can be used to launch the tool into the main line. We use several types of Smart Pigs as part of our integrity management program:

**Magnetic Flux Leakage (MFL) Tools** identify and measure metal loss using magnetic resonance to create a temporary magnetic field and capture data. If no defects are found, an even distribution in the magnetic field will be shown. Anomalies such as metal loss will be revealed by a disruption in the magnetic field.

#### Ultrasonic Tools:

- Compression Wave Ultrasonic Testing tools measure pipe wall thickness and metal loss.
- Shear Wave Ultrasonic Testing tools detect longitudinal cracks, including weaknesses in a weld or other crack-like defects.

**Caliper/Geometry Tools** use mechanical arms or electro-mechanical means to measure the internal surface of the pipe. In doing so, it identifies dents, deformations, and other ovality changes, as well as girth welds and wall thickness, and in some cases, bends in the pipelines.

**Electromagnetic Acoustic Transducer (EMAT) Tools** are generally used to detect stress corrosion cracking and are commonly used in liquid pipelines.

Our integrity engineers determine which assessment tools should be used based on data integration analysis and potential factors associated with the pipeline.

## HOW IS THE DATA USED?

Smart Pig sensors transmit digital data back to our in-line inspection vendors for analysis. Advanced imaging software is used to identify the types of anomalies, if any. This enables us to determine what level of preventative maintenance is required. We can also use this information to plan for future repairs.



## WHAT ARE THE BENEFITS?

Smart Pigs are one of the most sophisticated and advanced tools we use to inspect the internal and external condition of our pipelines. The primary benefit of using the tools is to prevent potential issues before they happen. Additionally, the tools can clean and inspect the pipeline without having to stop the flow of product.

## PROTECTING PEOPLE AND THE ENVIRONMENT

Early detection helps keep our people and communities safe and significantly reduces the potential for environmental impacts.

✓ **76%**

Since 1999, corrosion-caused pipeline incidents are down 76% across the industry with the use of Smart Pigs.

## REGULATIONS

Our pipelines are regulated by the Pipeline and Hazardous Materials Safety Administration (PHMSA) under federal codes and regulations (49 CFR 192 for natural gas pipelines and Section 195.452 for liquids pipelines). These require us to perform baseline and reassessment testing. The frequency of this testing depends on several factors associated with the maximum internal allowable per code. We are required to inspect all pipelines at different frequencies, but often we assess at earlier intervals and inspect more miles of the pipelines than required, going above and beyond the federal regulations.

## ABOUT ENERGY TRANSFER

We own and operate one of America's largest and most diversified energy portfolios with more than 90,000 miles of pipelines and associated assets in 38 states and Canada. Our core operations include transportation, storage and terminalling for natural gas, crude oil, natural gas liquids, refined products and liquid natural gas.