HOW IT WORKS:

Smart Pigs (Inline Inspection)

Colonial uses many different tools to test the integrity of its pipeline and identify areas of concern, from aerial flyovers and new smart balls to cathodic protection and smart pig technology. Smart pigs are one of the most effective tools in a pipeline operator’s arsenal because they allow operators to preemptively identify potential problems along the system. Since 1999, corrosion-caused pipeline incidents industry-wide have been reduced by 76% as a result of inline inspection.

THE HISTORY OF PIGS

The earliest pipeline pigs were purely mechanical devices used to clean the pipeline. But as technology developed, the industry recognized the value of diagnostic imaging of the internal surface of the pipe. Mechanical pigs evolved into “smart pigs,” so called because they were able to scan pipe walls, looking for dents, cracks, corrosion, and other threats to the safe operation of the pipeline.

The term "pig" is an acronym derived from pipeline inspection gauge, the proper — though rarely-used name — for the technology. The acronym has stuck, because the noise pigs can make when moving through the pipeline has been said to sound like a squealing pig. Today’s smart pigs are highly-advanced devices that travel through Colonial’s system with the flow of the product while gathering information about anomalies in the wall of the pipe.

HOW DOES A PIG WORK?

A smart pig is inserted into the pipeline at a launching trap, which is an oversized section in the pipeline that is isolated from the line, and allows for the pig to be inserted. Once the pig is inserted, the trap is closed, and pig is pushed through the line by product flow until it reaches a downstream receiving trap. Smart pigs travel at speeds up to 10 miles per hour and can weigh as much as two tons.

Sensors in smart pigs are able to measure the thickness of the pipe wall and tell pipeline operators where potential problems exist that may need to be addressed.

Different types of smart pigs identify different potential weaknesses in the pipeline system. They can detect dents, pit corrosion, cracks and faulty weld seams as small as a half-inch in size.

A smart pig is placed in a launching trap to conduct an inline inspection.
HOW IT WORKS:

Smart Pigs

HOW OFTEN DO OPERATORS PERFORM INLINE INSPECTIONS?
Federal regulation requires liquid operators to conduct a continuous process of assessment and evaluation to maintain the integrity of the pipeline. Every mile of regulated pipeline in Colonial’s system undergoes inline inspection at least every five years.

HOW IS INLINE INSPECTION DATA USED?
Large amounts of raw data are generated as a result of smart pig inspections. Many of the anomalies identified by smart pigs are inconsequential, but the sensors collect enough information to help determine which ones are more likely to result in a breach of the pipe wall. Sophisticated computer programs allow operators to look at the data graphically or as 3D images to assist in evaluating the significance of the findings. Colonial uses the information to prioritize which sections should be investigated.

Maintenance activities initiated as a result of a smart pig inspection are sometimes called “pig digs.” Pig digs may include uncovering the pipeline to visually inspect a pipe segment, repairing pipeline coatings, or repairing or removing a section of pipe.

HOW EFFECTIVE IS INLINE INSPECTION?
No technology is foolproof, but inline inspection has provided the pipeline industry with a valuable tool to identify defects with a high degree of accuracy. The ability to find anomalies before they threaten pipeline safety makes inline inspection a critical tool in preventing pipeline incidents.

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