



STATE OF THE ART PRODUCTS AND SERVICES
FOR NON-DESTRUCTIVE TESTING

FROM THE FIELD

Problem:

A large petroleum producer in Alaska was forced to shut down a 34" diameter crude transit pipeline in August 2006, due to a leak in the line. The leak, found at the six o'clock position, was caused by MIC attack. The company wanted to test the line using a pig, but with the uncertainty regarding the integrity of the line, and the environmental issues involved, they had to be sure that the line could hold the pressure necessary for pigging without forcing more failures. The lower 1/3 of the pipe (four to eight o'clock) needed to be tested on two lines over a combined length of approximately 13 miles. Insulation was removed from both lines, prior to any inspection.

Solution:

Within only a few days of notification of the situation, TesTex mobilized enough manpower and equipment to operate six pipe scanning systems and headed to the North Slope of Alaska. TesTex began hand-scanning sections of the pipe almost immediately upon arrival. This was done with existing technology using the TesTex proprietary Low Frequency Electromagnetic Technique (LFET). After assessing the job needs as well as environmental conditions and constraints, the Solution Providers Group of TesTex, Inc. in Pittsburgh designed the Line Cat LFET O.D. Pipe Scanning System. This system, developed in less than twenty-one days, was approved by the United States Department of Transportation for usage as a rapid screening tool for bare piping and tape-coated piping. The Line Cat, with an inspection speed of up to ten feet per minute and a scanning width of 32", increased productivity by upwards of 600%. All data that was collected from the inspection was distance encoded. The motorized system required very little pipe preparation, and was operated with minimal personnel.

Several other NDT techniques were simultaneously used during this inspection. Automated Ultrasonics (AUT) required the removal of the protective tape surrounding the pipeline. This method proved to be very slow. Electromagnetic Acoustic Transducer (EMAT) technology was also used during the inspection. This was an improvement over AUT, because it was quicker and did not require the tape to be removed. EMAT could inspect "500 ft per day on tape wrapped pipe"¹. In comparison, the Line Cat, with a scan speed of 10 ft per minute, was able to scan nearly two times the distance per day than EMAT.

¹ John J. Nyholt, "Alternative NDT Techniques for Prudhoe Bay Pipeline Failures" [The NDT Technician](#) Jul. 2007: 1-6



Figure 1: This photo shows the top half of the Line Cat rig and the magnetic-wheeled motor system.



Figure 2: This is a picture of the underside of the Line Cat scanning rig. There are (16) 2" scanner pods that, when tightened against the pipe, provide a 32" wide scanning swath. Each scanning pod has a wheel at the front and rear in the same axial direction of movement, thus providing independent suspension for each 2" LFET scanner pod.

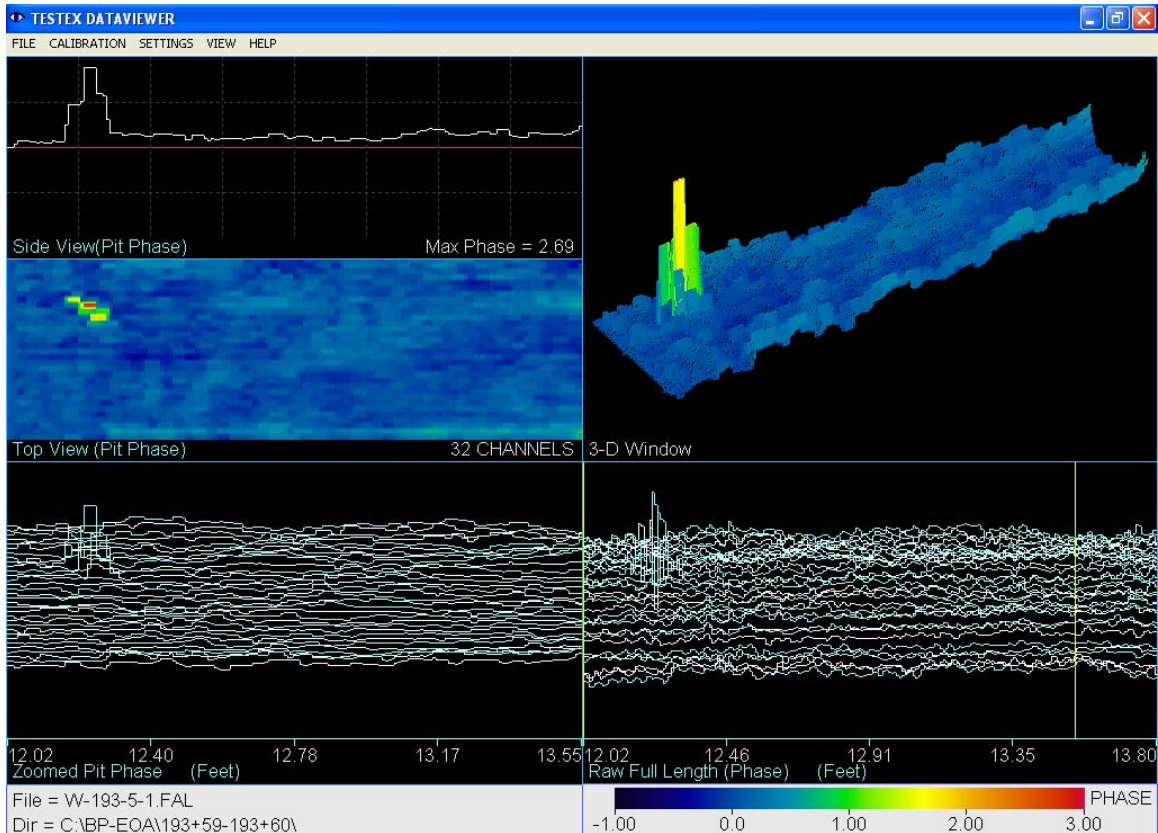


Figure 3: This figure depicts the actual display screen of an ID pit found using the Line Cat system. This waveform represents an ID pit with 0.262” wall remaining of 0.375” original wall. As the waveform shows, the pitting from MIC attack was very isolated.

Conclusion:

TesTex was able to mobilize and begin performing an inspection with very little notice, while concurrently developing a new technology to increase productivity and customer satisfaction. With the information provided by TesTex, Inc., the petroleum producer was able to conclude that the pipeline was durable enough to run the pig without concern. This inspection will help ensure the integrity of the pipeline and consequently aid in the protection of the fragile arctic environment and wildlife.

For more information on the TesTex, Inc. Line Cat LFET System or other TesTex products and services, please contact us at testex-ndt@verizon.net or call us at (412) 798-8990.

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