

Touch Point Corrosion™ Inspection

Current Condition

Many refineries and petrochemical facilities experience leaks and failures in their piping systems due to a phenomenon known as “Touch Point Corrosion™” or TPC™. TPC™ occurs when a pipe rests on a metal or wooden object resulting in the potential creation of a corrosion cell. Since the TPC™ areas are inaccessible, manual ultrasonic thickness readings cannot be performed without lifting the pipe. These lifts can lead to other problems such as dislodging environmentally sensitive materials and/or potentially causing additional damage to the piping system.

MISTRAS Group Inc. Integrated Solution

MISTRAS Group Inc., with support from its sister company, Physical Acoustics Corporation (PAC), has developed an inspection methodology that quickly determines the integrity of a piping system by paying special attention to TPC™ concerns. This non-intrusive approach utilizes a combination of visual inspection, semi-automated ultrasonics and manual ultrasonic inspection to identify and evaluate problem areas. This approach offers system owners the benefit of globally inspecting piping systems more rapidly, without further damage being incurred through pipe lifting. Specific areas are identified for follow up manual ultrasonic inspection in order to determine if further mitigation is required to avoid a potentially unsafe, environmental or product loss problem. Ultimately, this comprehensive approach allows owners to continue to operate their piping systems with the confidence that they have thoroughly evaluated a difficult to inspect area.



Figure 1. MISTRAS designed and manufactured Pocket UT System with portable flexible Bridge Assembly to fit many pipe sizes used for Touch Point Corrosion™ Inspection

Initially, a global inspection of the piping system is performed. This includes a visual inspection for signs of insulation degradation if the system is insulated, or other signs of piping failure such as paint blistering and staining of uninsulated systems. Next, Long Range Ultrasonic inspection, utilizing guided waves, may be performed in order to determine specific areas of concern for follow up inspection. Guided waves utilize both torsional and longitudinal waves in order to inspect large lengths of piping from a single inspection point. The inspection allows us to determine potential problem areas for follow-up definitive inspection.

The follow up inspection is performed using a Pocket UT System developed and manufactured by our sister company, NDT Automation (Figure 1.). An ultrasonic

attenuation study is performed utilizing the Pocket UT System. The ultrasonic data from the inspection is interpreted using a proprietary calculation developed by our in-house engineering staff and programmed into the Pocket UT Instrument. The equation considers a combination of factors including pipe length, amplitude loss, the cross sectional affected area and other factors in order to estimate a percent (%) wall loss. The wall loss then leads to an A-D Grade of the area in question. (Figure 2.)

All inspection information is documented in MISTRAS' proprietary Asset Integrity and Inspection Management program named PCMS. The area where long range UT Collars are placed are designated in the program on the field isometric drawings along with weldments and attachments that are easily discernible from the inspection results. Areas of anomalies are also indicated on the drawing along with the grade of the area resulting from the manual ultrasonic inspection. The documentation of these inspections provides more accurate information for the piping system owners to perform the necessary repairs and monitor these exact areas in the future.

MISTRAS Services Division, a member of MISTRAS Group Inc., is dedicated to developing and providing innovative solutions to the refinery industry that yield increased productivity and more accurate results in order to allow refinery employees to operate their plant safely and more efficiently.

	CLASS "A": Thickness wall loss from 0% to 25%				
	CLASS "B": Thickness wall loss from 25% to 50%				
	CLASS "C": Thickness wall loss from 50% to 75%				
	CLASS "D": Thickness wall loss of more than 75%				
4" Diameter Crude Line Pipe Supports					
Scan Identification	ISO Dwg Ref.	Technique Type	Comments/Length	Attenuation/% Wall Reduction	Class ID
4" Line Support 1	111-1	Pocket UT	Suspect area with attenuation 2"	-20db/53%	C
4" Line Support 1	111-2	Pocket UT		-20db/53%	C
4" Line Support S2	111-4	Manual	No Suspect Areas Detected	<6db	A
4" Line Support S3	111-5	Manual	Suspect area/3"	-17db/63%	D

Figure 2. Example Grading Criteria for Touch Point Corrosion™ (A-D) related to Approximate % Wall Loss

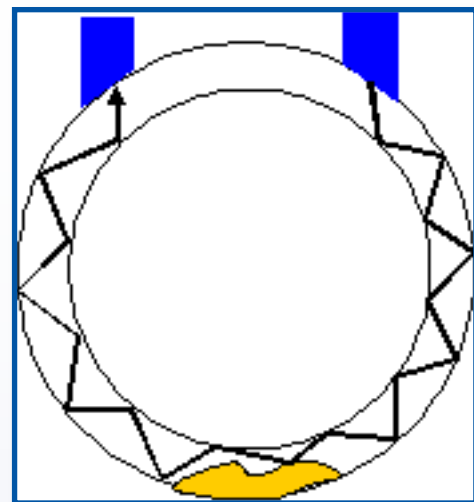


Figure 3 Schematic of Ultrasonic Touch Point Corrosion™ Inspection Method

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