

Docket No. SA-534
Exhibit No. 8-E

NATIONAL TRANSPORTATION SAFETY BOARD

Washington, D.C.

Excerpt from NACE SP0102-2010, Table 1
Standard Practice In-Line Inspection of Pipelines
Revision 2010-03-13

(2 Pages)

Table 1: Types of ILI Tools and Inspection Purposes⁽⁶⁾

Anomaly	Imperfection/ Defect/Feature	Metal Loss Tools			Crack Detection Tools		Deformation Tools
		Magnetic Flux Leakage (MFL) Standard Resolution (SR)	High Resolution (HR)	Ultrasonic Compression Wave ^(M)	Ultrasonic Shear Wave ^(M)	Transverse MFL	
Metal Loss	External Corrosion	Detection ^(A) Sizing ^(B)	Detection ^(A) Sizing ^(B)	Detection ^(A) Sizing ^(B)	Detection ^(A) Sizing ^(B)	Detection ^(A) Sizing ^(B)	No Detection
	Internal Corrosion	No ID/outer diameter (OD) discrimination					
	Gouging						
Crack-Like Anomalies							
	Narrow Axial External Corrosion	Detection ^(A)	Detection ^(A)	Detection ^(A) Sizing ^(B)	Detection ^(A) Sizing ^(B)	Detection ^(A) Sizing ^(B)	No Detection
	Stress Corrosion Cracking	No Detection	No Detection	No Detection	Detection ^(A) Sizing ^(B)	Limited Detection ^{(A)(C)} Sizing ^(B)	No Detection
	Fatigue Cracks	No Detection	No Detection	No Detection	Detection ^(A) Sizing ^(B)	Limited Detection ^{(A)(C)} Sizing ^(B)	No Detection
	Long Seam Cracks, etc. (toe cracks, hook cracks, incomplete fusion, preferential seam corrosion)	No Detection	No Detection	No Detection	Detection ^(A) Sizing ^(B)	Detection ^{(A)(C)} Sizing ^(B)	No Detection
	Circumferential Cracks	No Detection	Detection ^(C) Sizing ^(B)	No Detection	Detection ^(A) Sizing ^{(B)(D)}	No Detection	No Detection
	Hydrogen-Induced Cracking (HIC)	No Detection	No Detection	Detection ^(A)	Limited Detection	No Detection	No Detection
Deformation							
	Sharp Dents	Detection ^{(E)(G)}	Detection ^{(E)(L)}	Detection ^{(E)(G)}	Detection ^{(E)(G)}	Detection ^{(E)(G)}	Detection, ^(F) Sizing

⁽⁶⁾ For additional information, refer to API 1163.³

Table 1: Types of ILI Tools and Inspection Purposes (continued)

Anomaly	Imperfection/Defect/Feature	Metal Loss Tools			Crack Detection Tools		Deformation Tools
	Inclusions (Lack of Fusion)	Limited Detection	Limited Detection	Detection, Sizing ^(B)	Limited Detection	Limited Detection	No Detection
	Cold Work	No Detection	No Detection	No Detection	No Detection	No Detection	No Detection
	Hard Spots	No Detection	Detection ^(C)	No Detection	No Detection	No Detection	No Detection
	Grind Marks	Limited Detection ^(A)	Limited Detection ^(A)	Detection ^{(A)(B)}	Detection ^{(A)(B)}	Limited Detection ^{(A)(B)}	No Detection
	Strain	No Detection	No Detection	No Detection	No Detection	No Detection	Detection ^(D)
	Girth Weld Anomaly (voids, etc.)	Limited Detection	Detection	Detection	Detection ^(D)	No Detection	No Detection
	Scabs/Slivers/Blisters	Limited Detection ^(A)	Limited Detection	Detection ^{(A)(B)}	Detection ^{(A)(B)}	Limited Detection ^(A)	Limited Detection

- ^(A) Limited by the detectable depth, length, and width of the indication.
- ^(B) Defined by the sizing accuracy of the tool.
- ^(C) Reduced probability of detection (POD) for tight cracks.
- ^(D) Transducers to be rotated 90°.
- ^(E) Reduced probability of detection (POD) depending upon size and shape.
- ^(F) Also circumferential position, if tool is equipped.
- ^(G) Sizing not reliable.
- ^(H) If tool is equipped for bend measurement.
- ^(I) Composite sleeve without markers is not detectable.
- ^(J) If tool is equipped, dependent on parameters.
- ^(K) If tool is equipped with mapping capabilities.
- ^(L) Sizing is tool dependent.
- ^(M) ILI technologies that can be used only in liquid environments, i.e., liquids pipelines or in gas pipelines with a liquid couplant.