



Piping Inspection

Process piping – codes, inspection, testing methods, CMLs

Codes to be used and what they cover:

Inspection Codes:

- API 570: In-service Inspection, Rating, Repair, and Alteration of Piping Systems
- API 574: Inspection Practices for Piping System Components
- API 580: Risk-based Inspection
- API 2611: Terminal Piping Inspection
- ASME B31.3: Process Piping
- ASME PCC-2: Repair of Pressure Equipment and Piping

Inspection methods

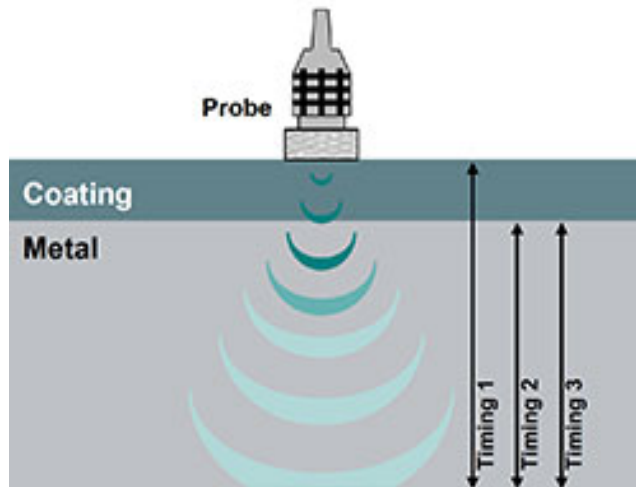
External Visual Inspection

Performed to:	Pros:	Cons:
<ul style="list-style-type: none">• External condition• Insulation system• Painting/coating system• Sign of misalignment• Leakage	Determine critical areas	Only visible defects
	Evaluate outside corrosion	
	Evaluate depth of pits	
	Dislodged support	
	Expansion joints	

Thickness Measurements

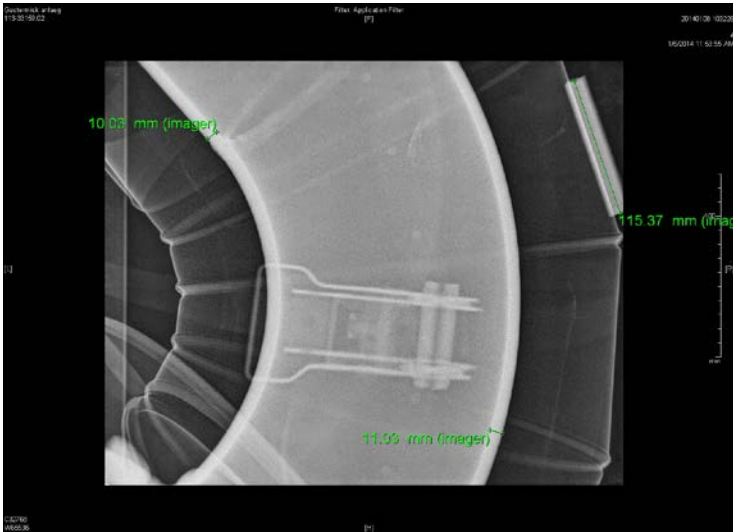
Ultrasonic Examination (manual ultrasonic)

Performed to:	Pros:	Cons:
	Simple to use	Only small areas
	Lightweight equipment	Cannot scan on corrosion
	Can detect backside corrosion	Not usable for small pipe sizes



Thickness Measurements

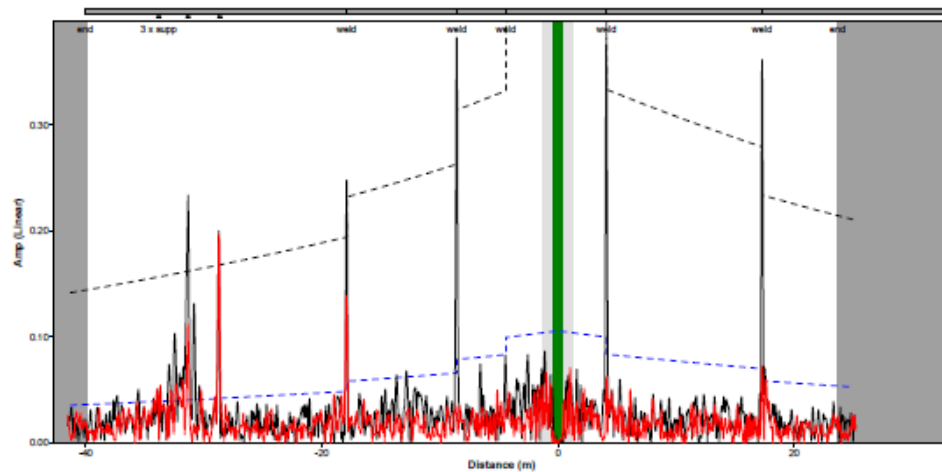
Digital Radiography

Performed to:	Pros:	Cons:
	Insulation can remain intact	Using of X-rays
	Small pipe connections	Sealing off is necessary
	Visual record	

Screening method

Long Range (Guided Wave inspection)

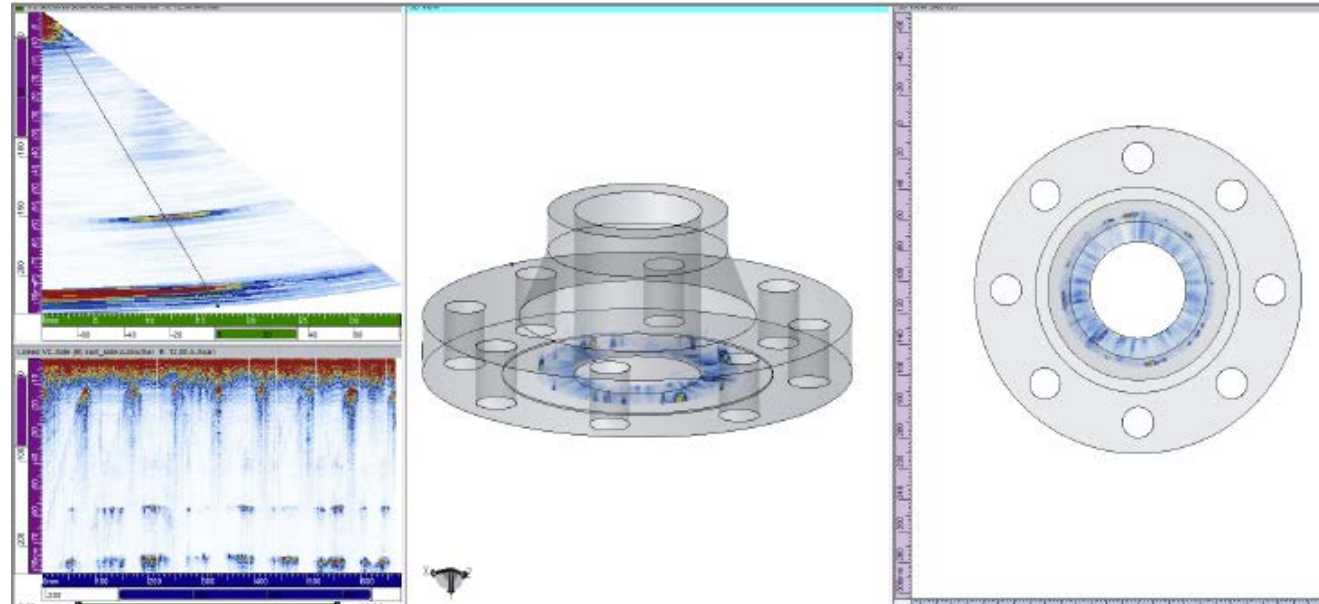
Performed to:	Pros:	Cons:
	Fast screening method	Inaccurate
	Underground / insulated piping	Distance depends on many factors



Scan of flanges

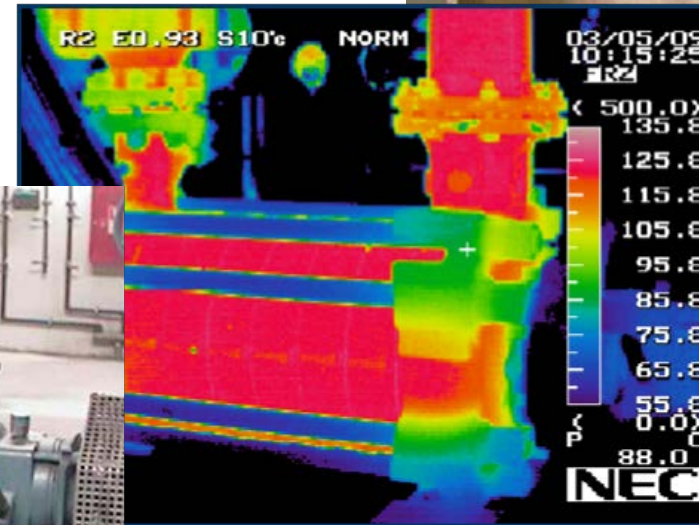
Phased Array 3D

- In-service scanning of flanges



Other inspection techniques

- Internal visual inspection
- Pressure tests
- Thermographic inspection



CML – Condition Monitoring Locations

Examples of selected points as CML



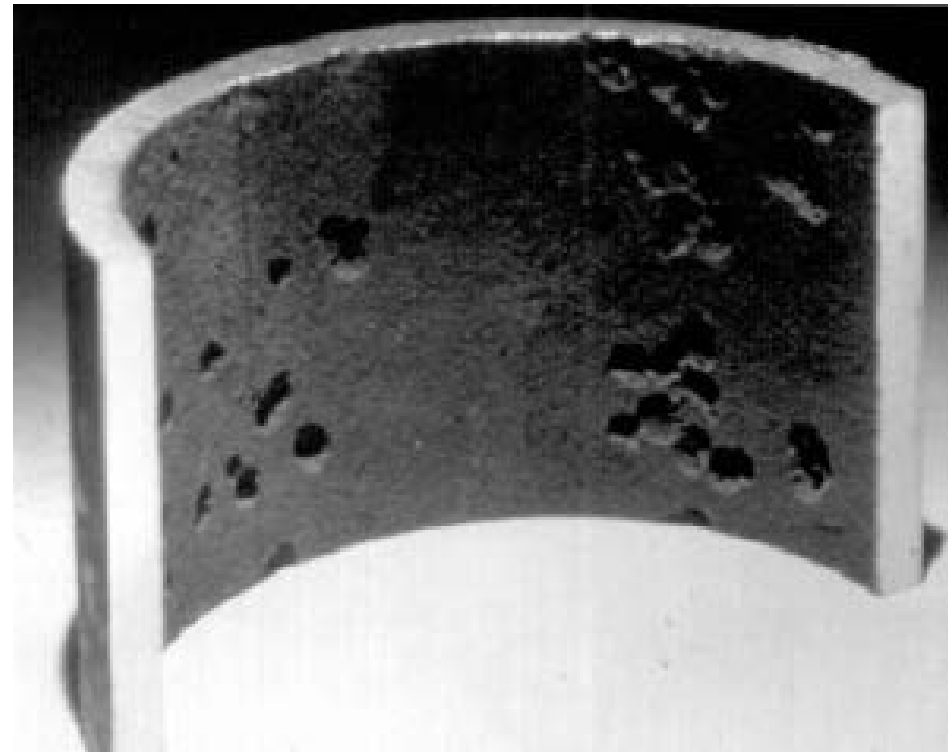
Examples of damages

CUI – Corrosion Under Insulation



Examples of damages

Inside corrosion



Examples of damages

Misalignments



Examples of damages

Soil-to-air contact – Non creative solutions



Further information at forcetechnology.com

