

**INEOS**

Olefins & Polymers  
UK

# AGI Inspection

UKOPA Technical Seminar

February 2025



# Contents

- Ownership & Limits of Inspection Responsibilities
- Degradation Mechanisms Effecting Ageing AGIs
- Use of New Technology – Case Study



# Ownership & Responsibilities

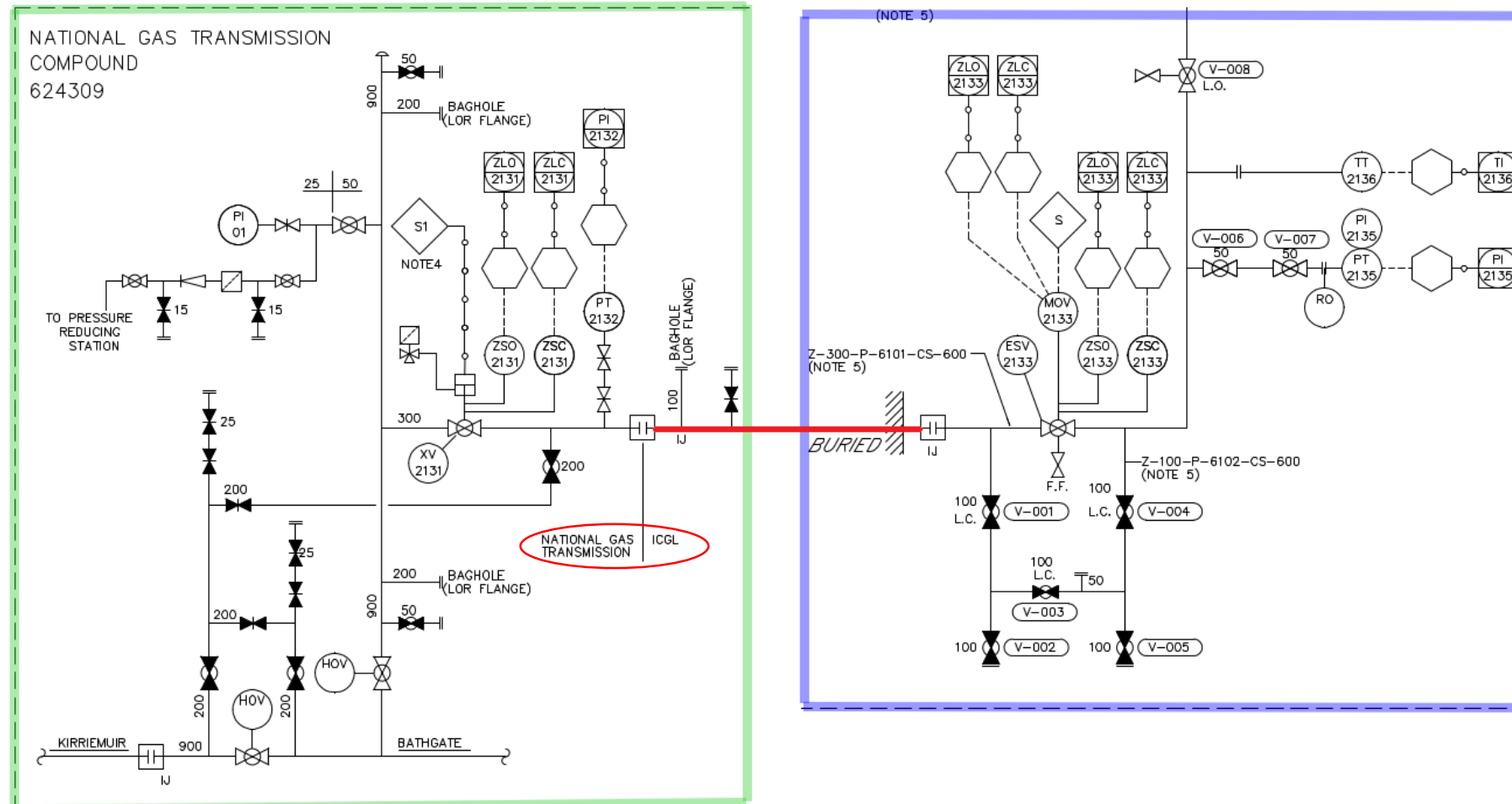
Confirm the limits of inspection

- Change of Owners – Different companies



# Ownership & Responsibilities

Confirm the limits of inspection





# Ownership & Responsibilities

Confirm the limits of inspection

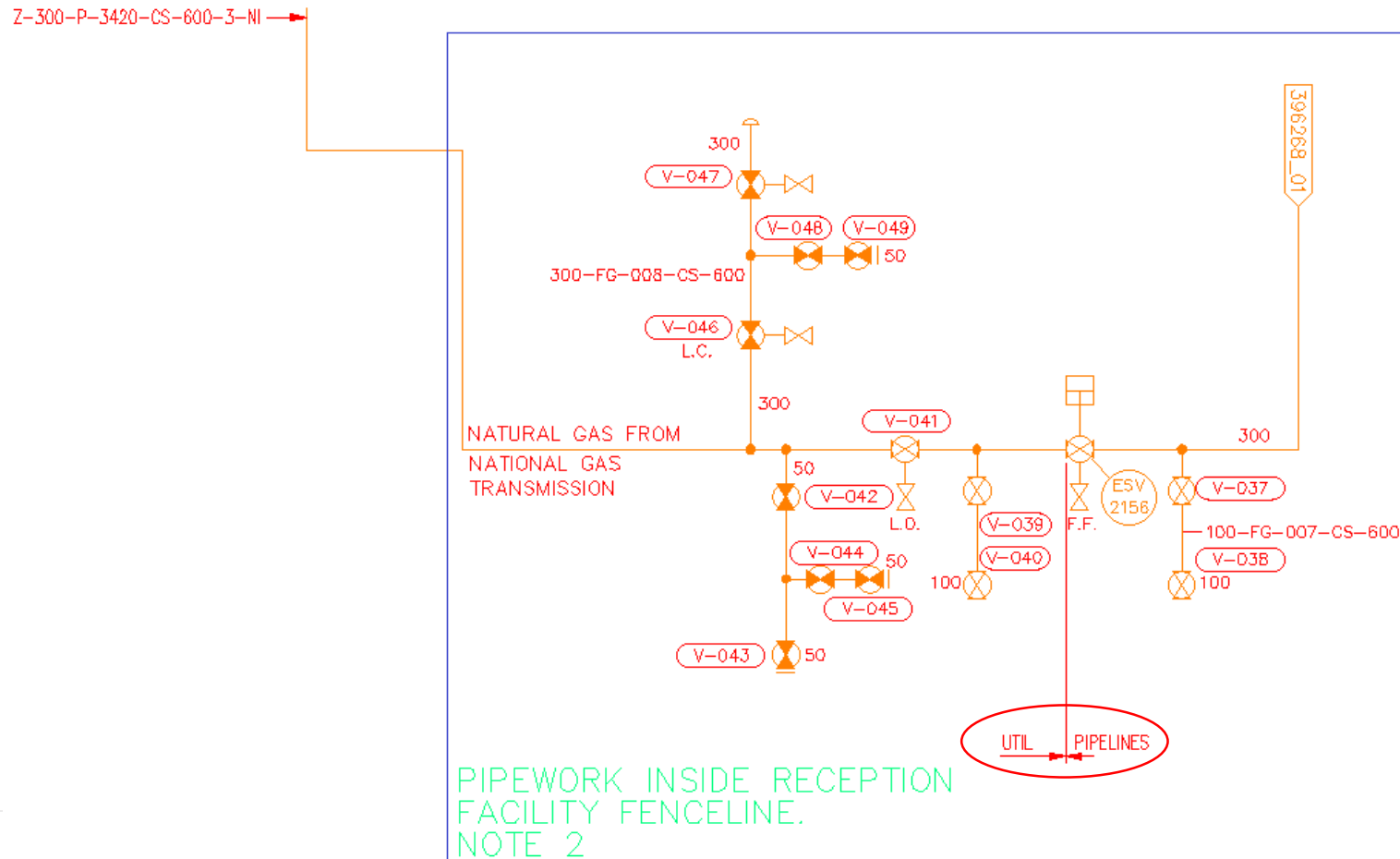
- Same Owners – Different Departments



# Ownership & Responsibilities

Confirm the limits of inspection

## ■ Same Owners – Different Departments



# AGI Inspection

## Some Typical Degradation Mechanisms

- Internal Corrosion
  - Deadlegs / Low Flow
  - Sour service
  
- External Corrosion Mechanisms
  - External corrosion – paint breakdown from general weathering
  - Soil-to-air interface corrosion
  - Flange face crevice corrosion
  - Galvanic corrosion – SS instruments to CS pipework
  - Corrosion under pipe supports
  
- ...plus many others, your responsibility to define and ensure inspection coverage







# Corrosion Under Pipe Supports

## ■ Option 1

- Build temporary scaffold supports
- Drop the support to carry out visual inspection
- 60% more expensive
- Select a %age of supports to assess

## ■ Option 2

- Advanced NDT technique
- Avoids removing supports
- Can do 100% of supports
- PA-CAT – New Technology
- 39 supports to check

# Corrosion Under Pipe Supports

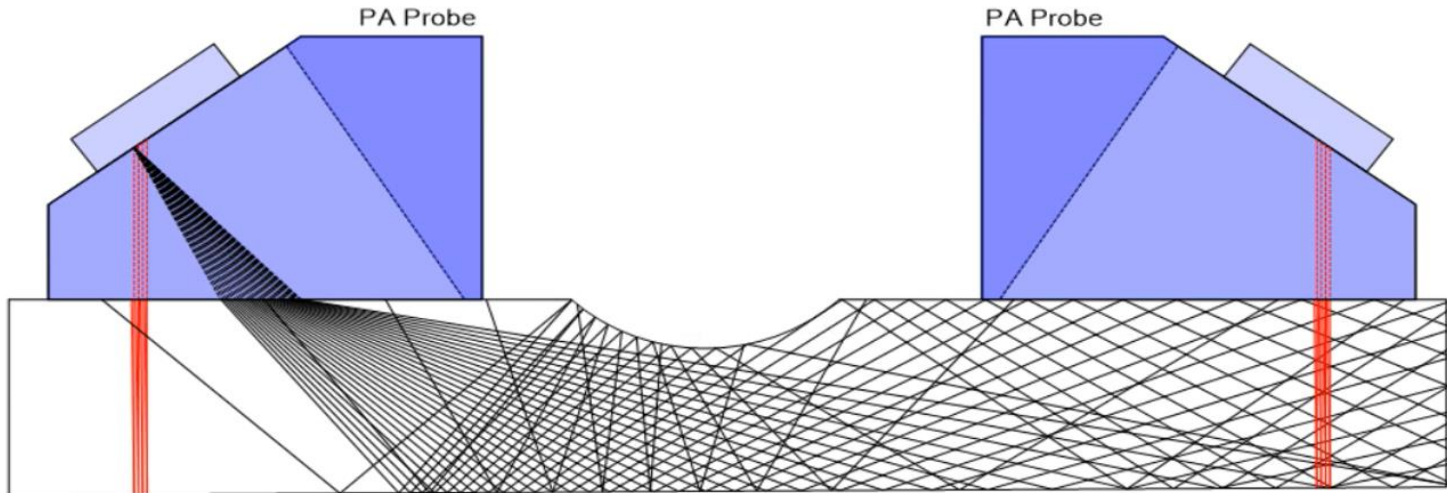
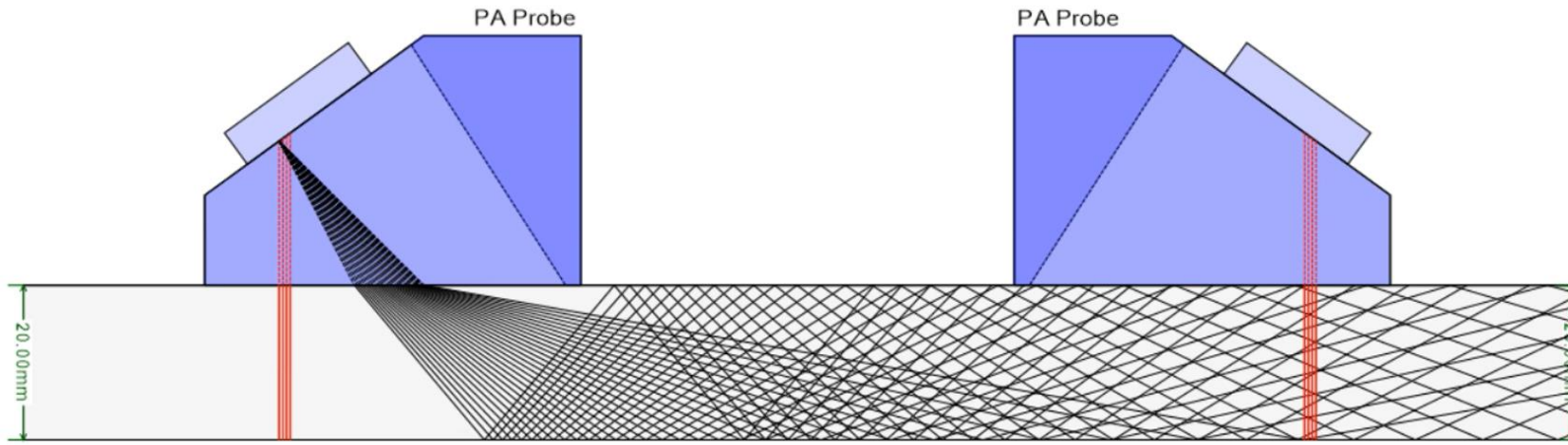
## PA-CAT

- Scope / coverage defined
- Understand technique & limitations
- Validate the findings



PA-CAT = Phased Array Composite Angle Technique





- Phased array ultrasonic technique
- Based on signal attenuation between two probes
- Good material – minimal sound attenuation
- Corroded material – amount of attenuation recoded based upon severity of wall loss
- Data quality of great importance
- Algorithmically analysed by online subscription modelling software



# Corrosion Under Pipe Supports

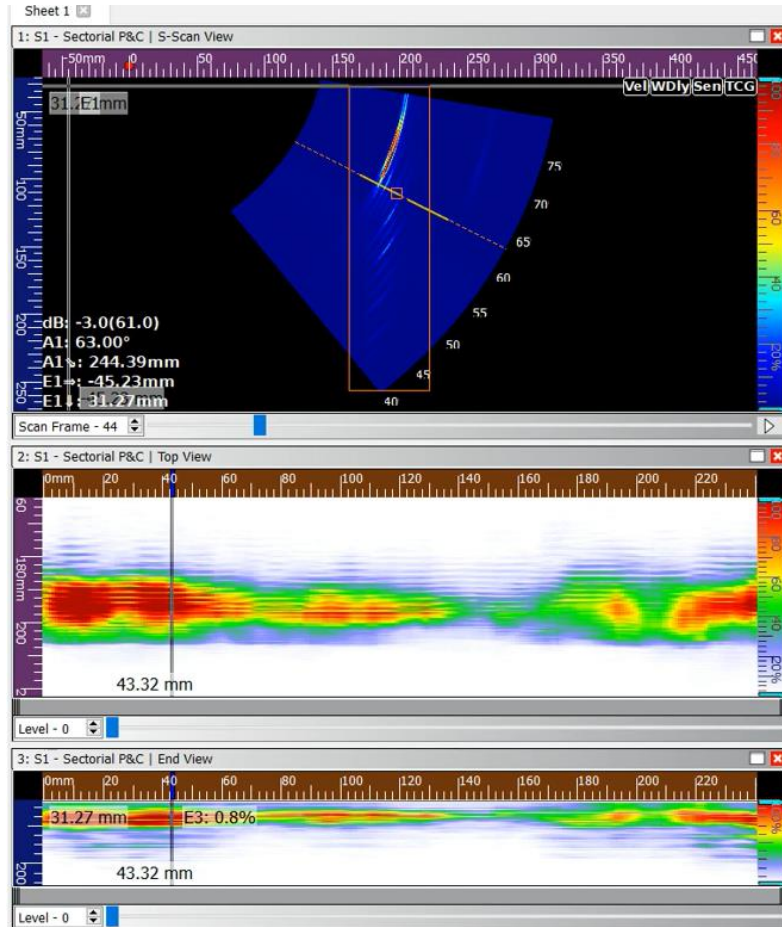
PA-CAT



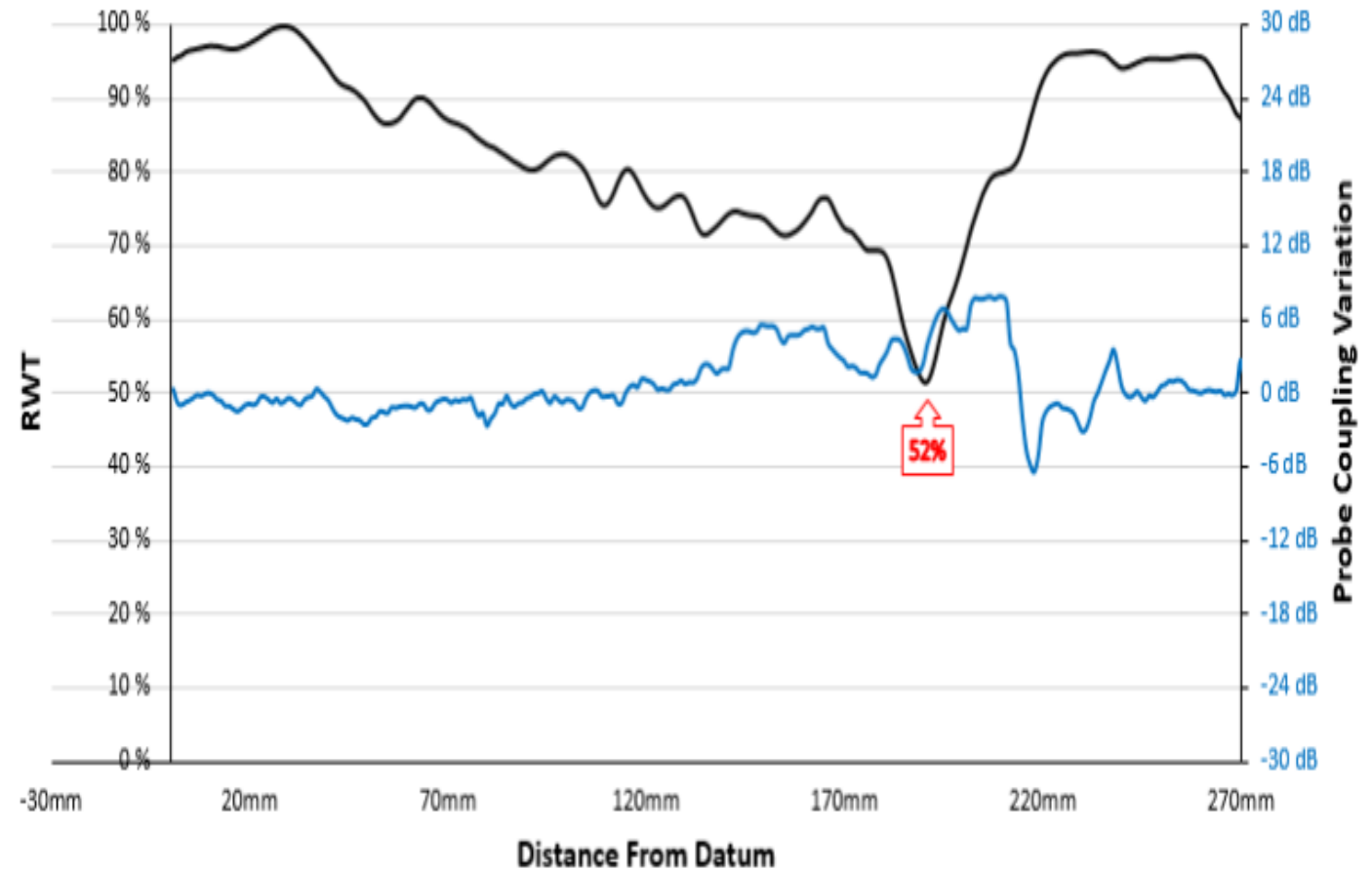


# Corrosion Under Pipe Supports

PA-CAT



Software View



River Bottom Profile

# Corrosion Under Pipe Supports

## Limitations

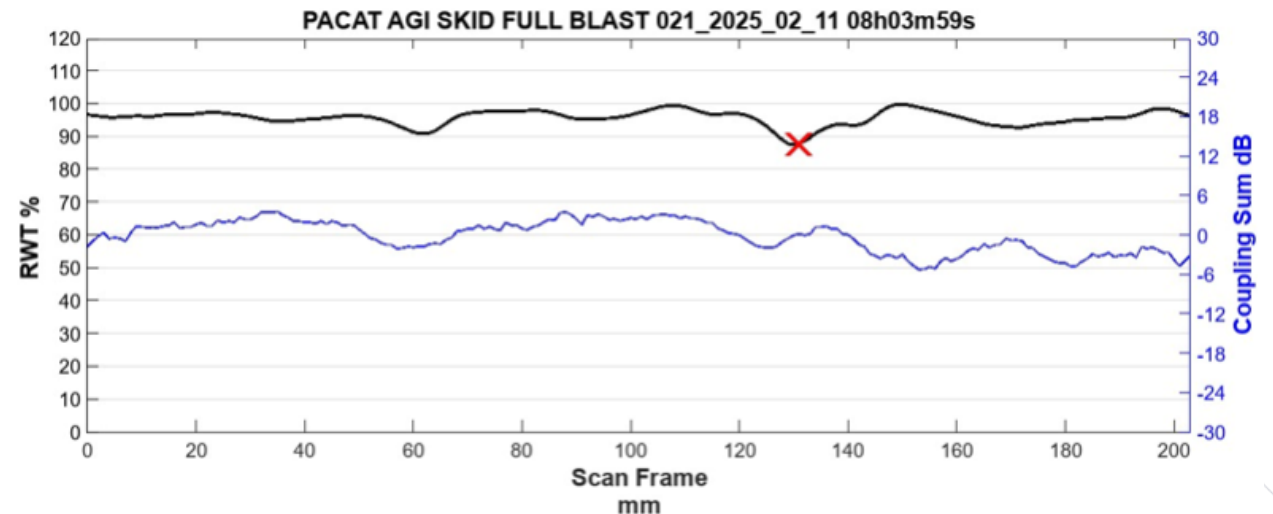
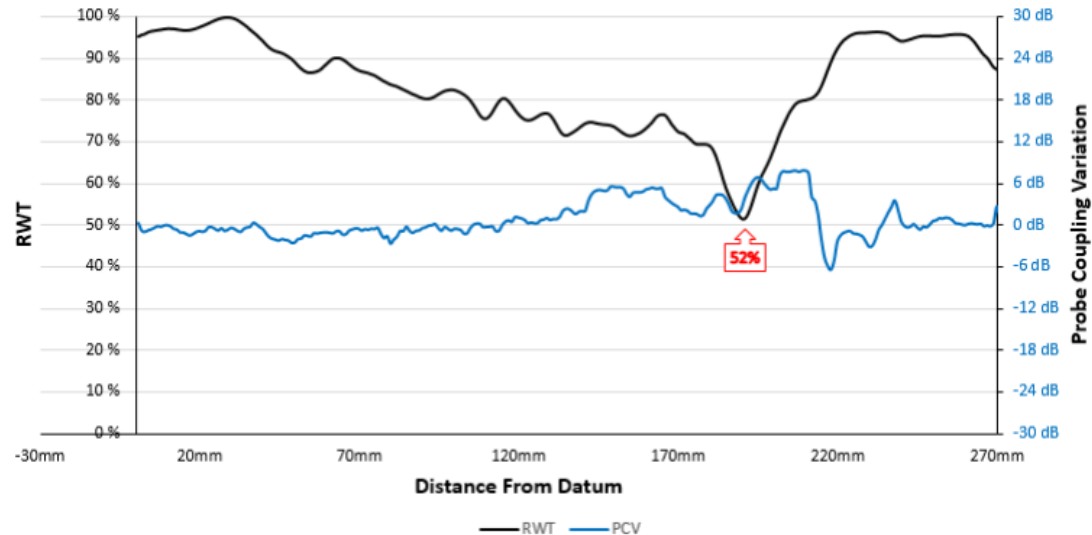
- Can scan range of pipe supports / clamps / guides
- Limited by size of support (probes must be <500mm apart)
- Successful from 3.91mm to 16mm NWT
- Used on pipe from 2" diameter and above NB.
- Surface conditions must be smooth in areas of probe seating (bare metal or if painted – then smooth / uniform paint).
- Temperature up to approx. 50deg C without need for highly specialist equipment.



# Corrosion Under Pipe Supports

## Issues we faced

- Uneven paint surfaces
- FBE coatings (transition from FBE to painted)
- 4mm loss under one support
  - Followed up and found to be attenuation issues from the silicone giving losses



# Corrosion Under Pipe Supports

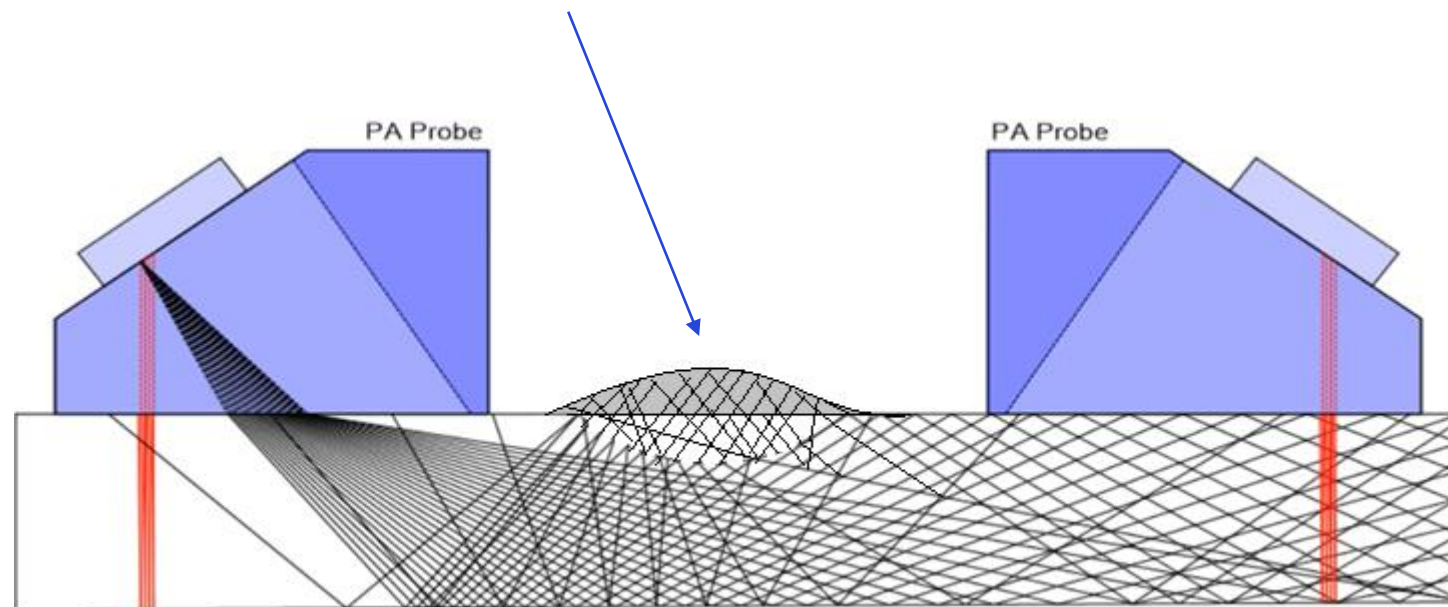
Issues we faced





# Corrosion Under Pipe Supports

Issues we faced

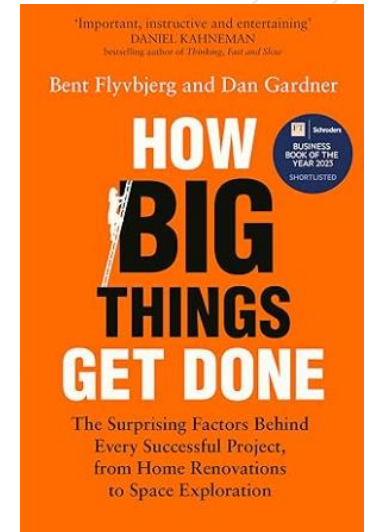


# Corrosion Under Pipe Supports

## Importance of Validation

Technology is frozen experience

*'How Big Things Get Done' by Bent Flyvbjerg and Dan Gardner*



- We prefer highly experienced trades people to work in our homes
- Should we also prefer using highly experienced technology.
- Technology is not often seen this way and often assume newer is better.
- If experience is valued properly, then be wary of a technology that is new, because it is inexperienced technology.