UKOPA
United Kingdom Onshore Pipeline Operators' Association

2022 Product Loss & Fault Data

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Main Meeting - Edinburgh
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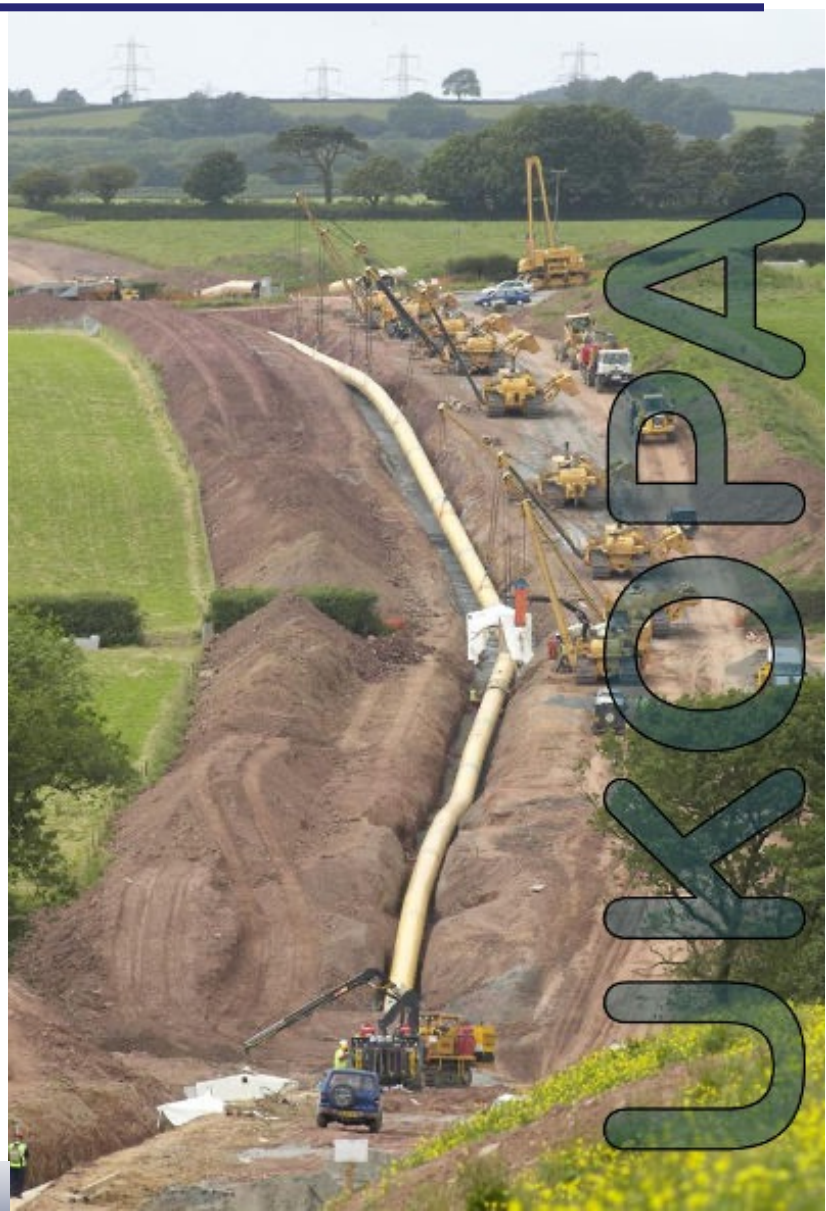

2022 Data Collection

Company	Contact (?)	Data		
		Pipeline	Product Loss	Fault
Cadent	Karen Green	✓	0	3
EOn	Martyn Hepworth	✓	0	0
Essar	Paul Potts	✓	0	0
GNI	Brian Leahy / Lar English	✓	0	2
INEOS	Jim Jarvie	✓	0	0
Ineos FPS	Akin Oshinowo	✗	✗	✗
National Gas	Ikenna Asogwa	✗	0	14
NGN	Iain Welldon	✓	✗	✗
Sabic	Geoff Glover	✓	0	2
SGN Scot	Mark Fisher	✓	0	13
SGN South	Zakir Ali	✓	0	1
Shell	Forbes Masterton / Dave Brown / Andy Mottram	✗	✗	✗
Uniper	Dan Davies	✗	0	✗
Wood	Greg Thompson	✗	✗	✗
WWU	Matt Davies	✓	2	8
		TOTAL	2	43

2022 Preliminary Fault & Product Loss Data

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Cause	Faults	Product Loss
External Corrosion	*24*	
Internal Corrosion	*0*	
External Interference	*9*	
Original Construction Damage	*4*	
Material defect (pipe, mill damage, seam weld)	*1*	
Girth weld defect	*4*	*1*
Ground movement	*0*	
Other/unknown	*1*	*1*
TOTAL	***43***	***2***

2022 Product Loss Incidents

- Leaking Girth Weld
  - Rebuild at valve pit
  - Pinhole leak on weld wrap at tee
    - Repaired by encapsulation
- Leaking Valve
  - 1” Audco valve outside pit & not on plans
  - Leaking from grease point
    - Sealant injected to stop leak

Comparison with Last 5 Years Data

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Year	Product Loss	Faults	Defects
2022	*2*	*43*	*??*
2021	1	26	27
2020	1	87	156
2019	1	18	21
2018	1	115	141
2017	5	65	75
Average (2017 – 2021)	**1.8**	**62.2**	**84.0**

- Product loss trend relatively stable
  - With occasional bad year!
- Number of faults & defects varies more
  - With possible downward trend?

2022 Data Collection Issues

- Main issues this year
  - Late provision of data
  - Not all defects (or any) reported on defect sheet
  - ‘New’ dent/gouge classification not being followed

Late Data / Missing Data

- Late provision of fault data means
  - Delay in analysis of product loss data
  - Delay in production of Product Loss Report

- Missing defect data
  - Prevents further analysis
    - Regular update to damage distributions
      - Used in QRA

Dent/Gouge

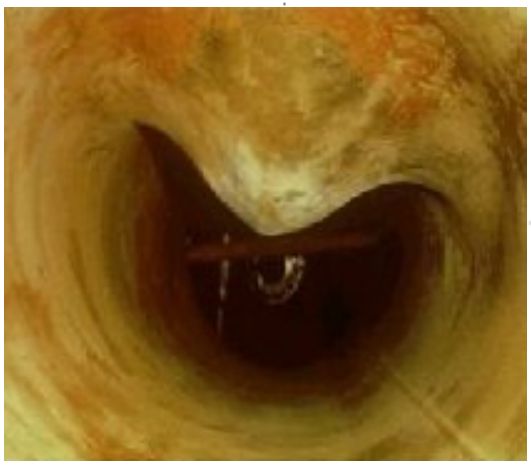
- ‘New’ dent/gouge classification not followed
  - FR/1 form in TBN011 and GN/PM/P/11
    - Plain Dent
    - Plain Gouge
    - Gouge in Dent
    - Dent with Gouge

Classification of Dent-Gouges

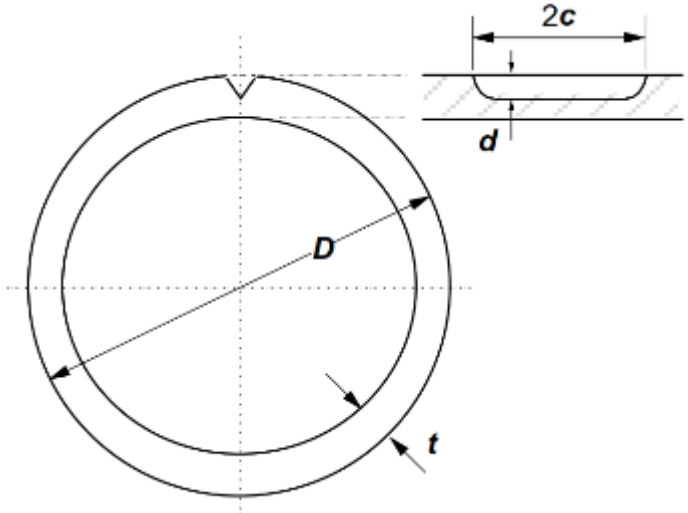
- Defect data statistics now in 5 separate distributions
  - ‘Plain’ dent
  - ‘Plain’ gouge
  - Dent with gouge
  - Gouge in dent
  - Dent force
    - Calculated from dent depth

‘Plain’ Dent and Gouge

- Plain dent
  - Smooth change in curvature of the pipe wall with no wall thickness reduction

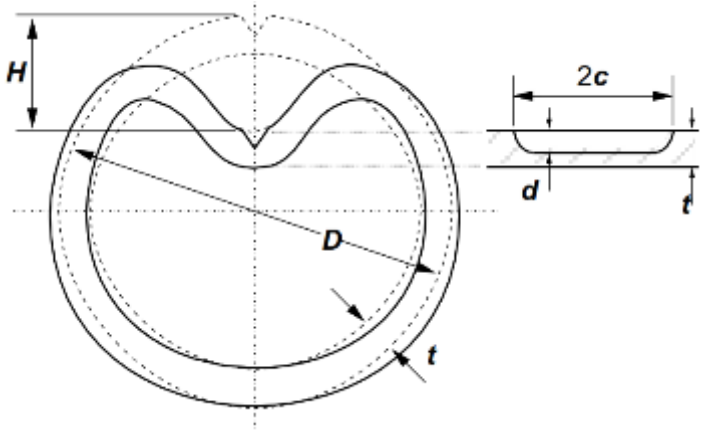


- Plain gouge
  - surface damage to a pipeline caused by contact with a foreign object that has displaced or removed material from the pipe wall, resulting in metal-loss.



Gouged Dents

- Combination of dent with gouge
- Reduction in wall thickness **and** change in radius of curvature



- If dent has a gouge in
  - Classify as Dent associated with gouge
    - Refer to associated gouge in dent in comments
- If gouge is in a dent
  - Classify as Gouge in Dent

Importance of Gouged Dents

- Important that we get dimensions for both the dent and any associated gouges
  - Dented gouges fail at much lower pressure than plain gouges
    - Need accurate info on %age of external interference incidents are gouged dents for failure frequency prediction
  - Information on type of defect required in P11…
    - Do GDNs still have their own P11 technicians and assessors?
    - Are P11 techs/assessors in same department as those collating data for UKOPA?

P11 Damage Categories
(Table 4 -up to X65 and 50% < σ_h ≤ 72%)

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- Smooth Dent + Gouge
  - Severe (fail as leak)
    - if length ≤ 0.1D
  - Extreme (fail as rupture)
    - if length > 0.1D

- All P11 assessment reports must be sent to:
  - Engineering Manager
  - Network Compliance & Integrity Lead
  - Mechanical Integrity Engineer
  - Asset Management
  - Asset Integrity Manager

TYPE OF DAMAGE (see Notes)	DAMAGE CATEGORIES			
	SUPERFICIAL	MODERATE	SEVERE	EXTREME
Welding Arc Strikes (9.2.2)	All Types	N/A	N/A	N/A
General Corrosion (Appendix H, 7.2.4)	$d \le 20\% t$	N/A	$20\% < d \le 80\% t$ **and** $L \le 0.20 R$	$d > 80\% t$ $d > 20\% t$ **and** $L > 0.20 R$
Pitting Corrosion (Appendix H, 7.2.4)	$d \le 50\% t$	N/A	$50\% < d \le 80\% t$ **and** $L \le 0.20 R$	$d > 80\% t$ $d > 50\% t$ **and** $L > 0.20 R$
Cracks *or* Spalling (Appendix H, 7.2.3)	$d \le 0.5$mm	N/A	Cracks present after 0.5mm to 0.7mm thickness of dressing **and** $L \le 0.20 R$	Cracks present after 0.5mm to 0.7mm thickness of dressing **and** $L > 0.20 R$
Smooth Dent (7.2.5, Figure 2)	$H \le 12\% D$	N/A	N/A	$H > 12\% D$
Smooth Dent *plus* General corrosion (Appendix H, 7.2.5, Note 1)	N/A	$H \le 4\% D$ **and** $d \le 12.5\% t$	$H \le 4\% D$ **and** $12.5 < d \le 40\% t$ **and** $L \le 0.20 R$	$H > 4\% D$ $H \le 4\% D$ **and** $d > 40\% t$ $H \le 4\% D$ **and** $d > 12.5\% t$ **and** $L > 0.20 R$
Smooth Dent *plus* Cracks *or* Spalling (Appendix H, 7.2.5)	N/A	$d \le 0.5$mm	Cracks present after 0.5mm to 0.7mm thickness of dressing **and** $L \le 0.20 R$	Cracks present after 0.5mm to 0.7mm thickness of dressing **and** $L > 0.20 R$
Smooth Dent *plus* Gouge (Appendix H, 7.2.5, Note 1)	N/A	Figure 6	Figure 6 **and** $L \le 0.20 R$	Figure 6 **and** $L > 0.20 R$
Kinked Dent (7.2.5)	N/A	N/A	N/A	All cases
Gouge (Appendix H, 7.2.6)	$d \le 12.5\% t$	$12.5\% < d \le 20\% t$	$20\% < d \le 80\% t$ **and** $L \le 0.20 R$	$d > 80\% t$ $d > 20\% t$ **and** $L > 0.20 R$
Stress Corrosion Cracking	N/A	N/A	N/A	All cases

2022 Data Collection & Support

- If your company has not yet responded, please can we have your data asap!
  - Let us know if the company contact for pipeline or fault data has changed

- If your fault data contact is struggling with data collection, classifying faults, new spreadsheets, point of it all or anything else
  - Myself and/or Chris Lyons are happy to discuss any issues on an individual basis
    - Either by visit or Teams