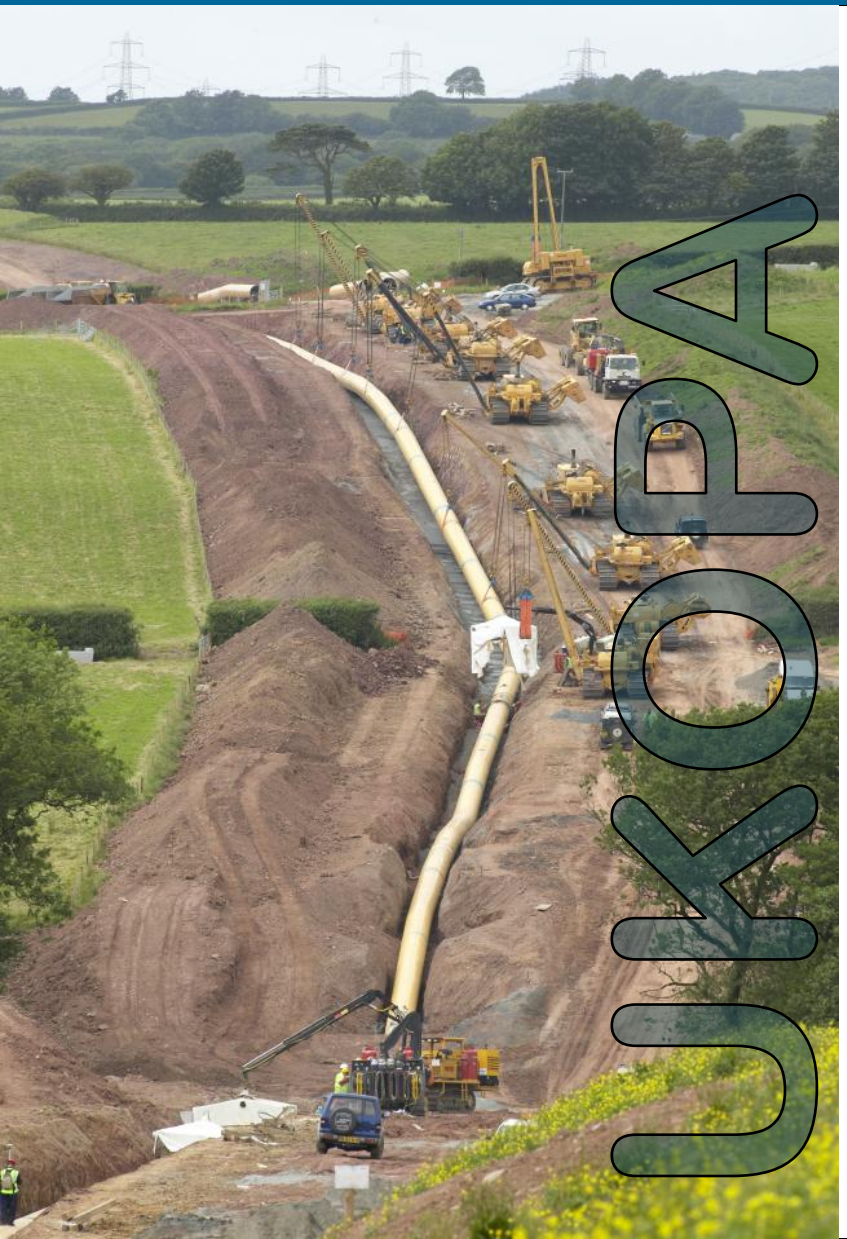


Fault and Risk Working Group (FARWG) Update

Simon Joyce – FARWG Chair
Asset Engineer (HP Gas Pipelines)
SGN
&
Graham Goodfellow
PIE

FARWG – Current Membership

1.	Simon Joyce	SGN (Chair)
2.	Nikki Barker	PIE (Secretary)
3.	Ryan Bentley	Cadent
4.	Kristina Brazenaite	Northern Gas Networks
5.	Dave Brown	Essar
6.	Graham Canty	Gas Networks Ireland
7.	Antonio Caraballo	Ineos FPS
8.	Neil Clarke	Valero
9.	Darren Cushen	Wales & West Utilities
10.	Stephen Humphrey	CLH-PS
11.	Fridolin Jenny	Swissgas
12.	Graham Pailor	Sabic
13.	Steve Potts	National Grid
14.	Richard Price	BPA
15.	Nick Procter	Wood Group PSN
16.	*Mike Acton*	*DNV GL*
17.	*Graham Goodfellow*	*PIE (former Chair)*
18.	*Rod McConnell*	*Independent consultant*

2018 Summary to date

- 2018 Meetings:
  - 5th April - SGN, Yarnton
  - 11th September – DNV GL, Loughborough
  - *4th December – National Grid, Ambergate*

- Key activities in 2018:
  - Develop TBN/GPGs covering historic work from RAWG
  - Update Fault Distributions & 3rd Party Failure Model
  - Leak & Fault Database 2017 update

2018 Work Programme

- Base Load
  - Collect fault data & issue Product Loss & Fault Report (1962-2017)
    - Operator data transfer issues – solved?
    - Inconsistent data entries – ongoing
  - Continued development of Liquid Hydrocarbon Database

- Key Priorities – Carried forward from 2017
  - Create 10 TBN/GPGs covering historic work from RAWG
  - Update Fault Distributions (>5 years since last update)
  - Update 3rd Party Failure Frequency Model Recommendations
  - Review Fault Data & Report requirements
  - HSE LUP thick-walled pipeline frequency
    - Reinstate LUP Case Database

Good Practice Guides

Good Practice Guides		Complete	Progress
1	Application of Cost Benefit Analysis to demonstrate ALARP	90%	2nd Draft presented by DNV GL at September meeting. Draft for approval due imminently.
2	Capturing & Monitoring Population Density	50%	1st draft overly commercial. 2nd draft concentrating on process with options on how to carry it out to be prepared for December meeting.
3	Managing Societal Risk in the vicinity of Gas Pipelines	90%	1st draft based on NG document – ALARP section now not needed. To be converted to TBN for December meeting.

- **Original Target completion – end of Q1 2018**
- **Revised Target completion – end of 2018**

TBNs of Historic Work

Technical Briefing Note		Complete	Progress
4	Collecting & Reporting Fault Data (incl.FR1 form)	25%	**On hold** whilst data structure reviewed
5	LUP Zones for Gasoline Pipelines	90%	Final draft ready for FARWG approval
6	Effect of Pipeline Surveillance on Risk	10%	Historic document on background to surveillance chart in IGEM/TD/2
7	History of Land Use Planning (incl. Event Tree & Ethylene Frequency)	50%	1st draft due end Q3
8	Oil Pipelines Drain Down Study	90%	2nd draft in preparation by oil pipeline operators for December meeting
9	Managing Encroachment & Societal Risk for Oil Pipelines	25%	Methodology included in 5 – content to be agreed with RMcC
10	Managing Societal Risk in the vicinity of Ethylene Pipelines	90%	Format to be updated and reference to ALARP GPG added for Dec. meeting

- **Target completion for all (except no. 4) – end of 2018**

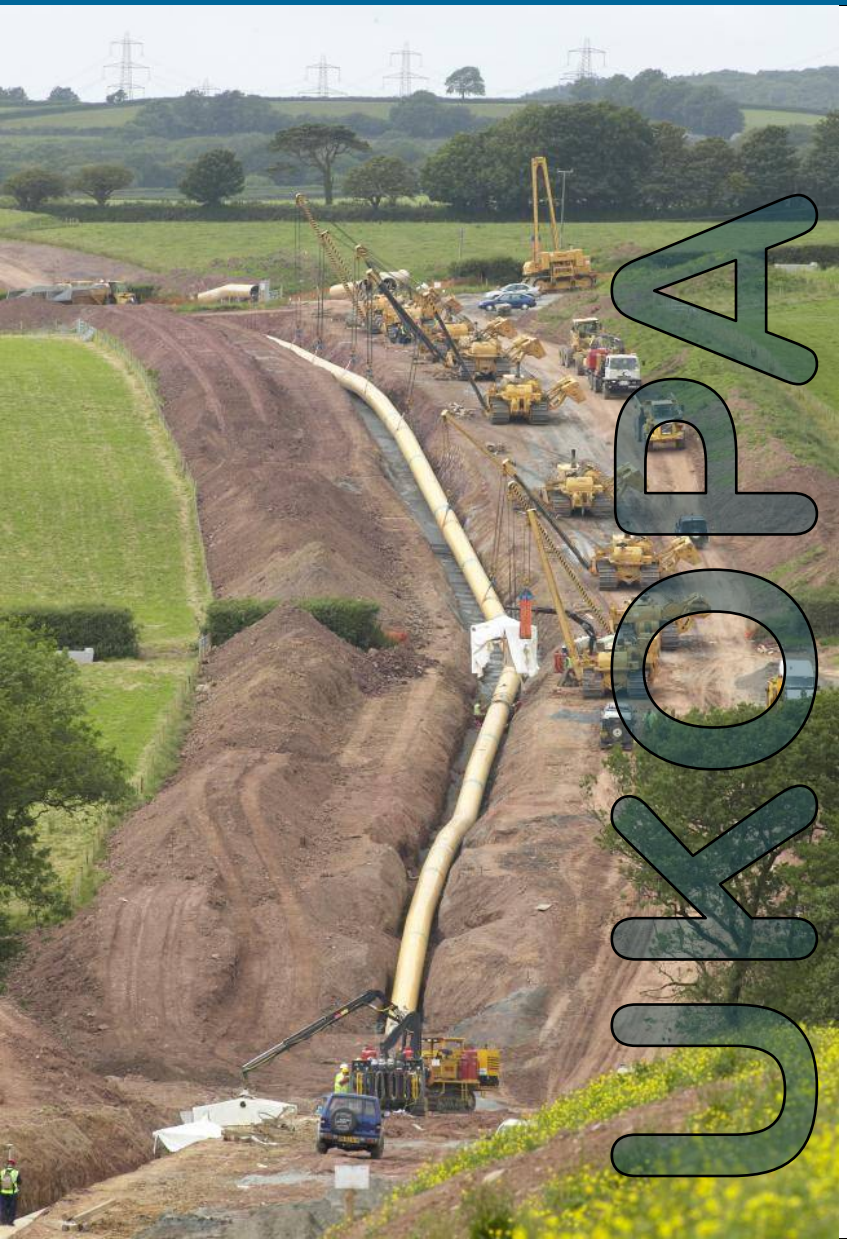
Update Failure Distributions

- 2015 data available
- More distributions required
  - ISRU review identified 5 separate distributions
    - Gouge Length
    - Gouge Depth
    - Gouge in Dent Length
    - Gouge in Dent Depth
    - Denting Force
  - Lognormal and Weibull distributions

- Presented at IPC2018
  - Publish in Product Loss & Fault Report

Update 3rd Party Failure Frequency Model

- 3 sources of models
  - AFFECT model from COOLTRANS
  - PDAM2 Report
  - New EPRG model
    - Still not published
    - Dr. Andrew Cosham currently reviewing model for EPRG
    - Initial (informal) feedback is that model may be slightly more accurate but less useful for failure frequency prediction
    - Ongoing (slow) discussions over MoU
- Objectives
  - Produce report recommending approach
    - Ongoing. Summary published as IPC Paper
  - Update PIE spreadsheet prediction tool and check standard set of cases for impact
    - Completed
  - Investigate web-based tool for failure frequency prediction
    - Limited interest from members



UKOPA MAHP Database Update

October 2018

2017 Product Loss & Fault Data

- 77 faults reported in 2017
  - Awaiting response from 6 operators
- 4 product loss incidents reported
  - 3 – Other, non welded joint
  - 1 – External Corrosion
- 1 product loss incident currently not reported (construction damage)
- Pipeline population data updates are in progress
- GNI UK have contributed to database for first time

- Data received from
  - NG, Cadent, NGN, WWU, SGN (Southern), SGN (Scotland), Ineos, Shell, BPA, Essar, GNI UK
- No data for 2017 from
  - Ineos FPS, Sabic, Eon, Uniper, Wood, *Mutual Energy*

- UKOPA Pipeline Fault Database Report will be prepared for FARWG approval by 30th November 2018

MAHP Database – 2017 Fault Data

Fault	*2017*	2016	2015	2014
Ext corrosion	*23*	58	64	33
Ext interference	*4*	15	10	7
Girth weld defect	*4*	0	0	2
Original construction	*5*	2	10	23
Material (pipe defect)	*8*	8	4	5
Ground movement	*4*	3	0	1
Other/unknown	*29*	12	9	11
No fault	*0*	8	0	2
Total	**77**	**106**	**97**	**84**

2017 Discovery Method	No.	%
ILI	48	62.3
CIPS/Pearson/DCVG	17	22.1
Public	1	1.3
Site Contractor	1	1.3
Other/Unknown	10	13.0
Total	**77**	**100**

Faults here represent damage to pipe or bend only

UKOPA Database (1962 – 2017)

Cause	Faults	Product Loss
External Corrosion	*1336*	*43*
Internal Corrosion	*29*	*2*
External Interference	*724*	*43*
Original Construction Damage	*307*	*0*
Material defect (pipe, mill damage, seam weld)	*448*	*16*
Girth weld defect	*217*	*36*
Ground movement	*44*	*7*
No fault	*47*	*n/a*
Other/unknown	*635*	*54*
TOTAL	**3787**	**201**

Data Quality

- Other/unknown showing largest increase in fault numbers
  - Data clean-up required
  - Manufacturing defect classified as “Unknown”
    - should be “Pipe Mill Damage”

Fault Cause	Fault Secondary / Other Cause
Pipe Mill Damage	
Pipe Mill Damage	
Unknown	Manufacturing Defect

  - Fault recorded as “Unknown” but due to pipe laid on rock
    - should be “Construction damage”
  - Dents recorded as “Other”
    - should be either “Construction Damage” or “External Interference”

Fault Cause	Fault Secondary / Other Cause
Unknown	Pipe laid on rock
Other	Dent
Other	Dent
Other	Dent

Data Quality

- Faults recorded as cause “Dent”
  - Dent is a defect type not a cause
  - should be either “Construction Damage” or “External Interference”

Fault Cause	Fault Secondary / Other Cause	Fault External Interference type	Affected Component
Dent			Pipe
Dent		Pipe sat on a rock	Pipe
Dent		Pipe sat on a rock	Pipe
Dent		Pipe sat on a rock	Pipe
Dent		Pipe sat on a rock	Pipe
Dent		Pipe sat on compact white sand	Pipe
Dent		Pipe sat on a rock	Pipe

MAHP Database Issues

- Data quality issues makes generation of Product Loss report harder each year
  - 2017 data will be added to 2016 report rather than full re-analysis of database

- 2019 Work Programme
  - Database Clean-up
    - Copy of database made and entries edited
    - Be prepared for follow up where it's not clear
  - Review of FR/1 forms
    - Many fields not used
      - Simplified forms may help people complete forms correctly…
    - Launch at Fault data seminar?