

UKOPA Meeting 13 October 2010

New Excel-Based UKOPA Fault Database

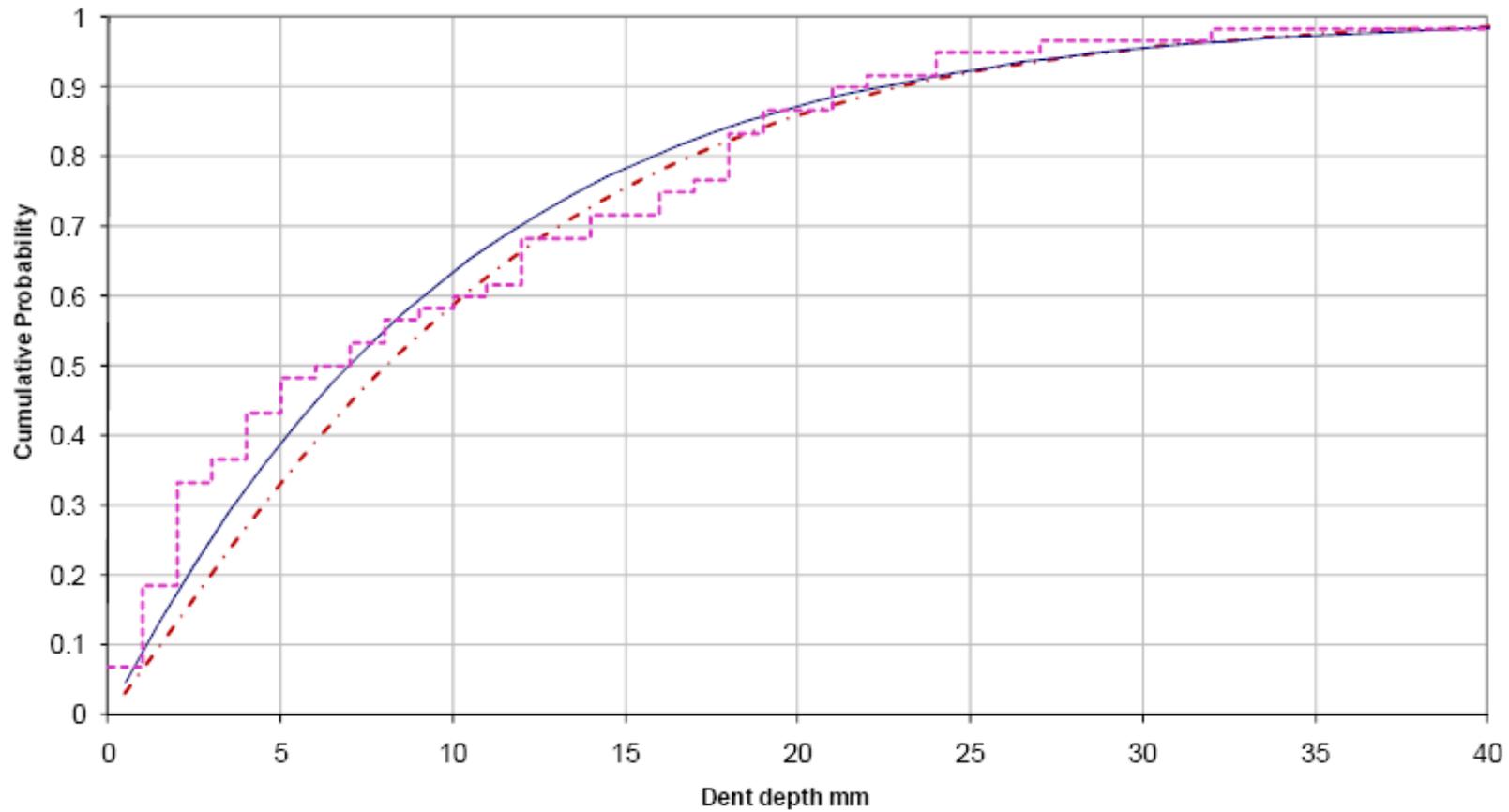
- 1. Benefit of collecting fault and failure data**
- 2. New datasets**
- 3. New data input facility**

1. Benefit of collecting fault and failure data

- Fault – any detected defect requiring excavation to investigate
- 2350 pipelines, 3050 faults**
- Leak – loss of product HSE generated risk assessment approach
for LUP zones based on AD Little & WS Atkins – 175 leaks**

□ Input Parameters for the Dent-Gouge Model

Table 6.1: Dent Depth Distribution and Goodness of Fit Parameters (Dent Depth in mm)



Pipeline Name

Example Pipeline

Nominal Diameter mm

323.8

Nominal Wall Thickness mm

6.35

Grade of Steel

X42

Operating Pressure bar

42

Press to Continue

Area Classification

Suburban

Save as New Case

Approximate Age

Pre-1980

Societal Risk Effect Distance (usually 1600 m)

1600

This is the interaction distance - the length of pipeline which could affect the developments - if less than 1600m

3rd Party Risk Reduction Factor (0.1 to 1)

1

This is the 3rd Party risk reduction/increase due to additional protection measures such as slabbing, extra markers, deeper or shallower cover, or extra surveillance - input a factor between 0.1 and 1.5

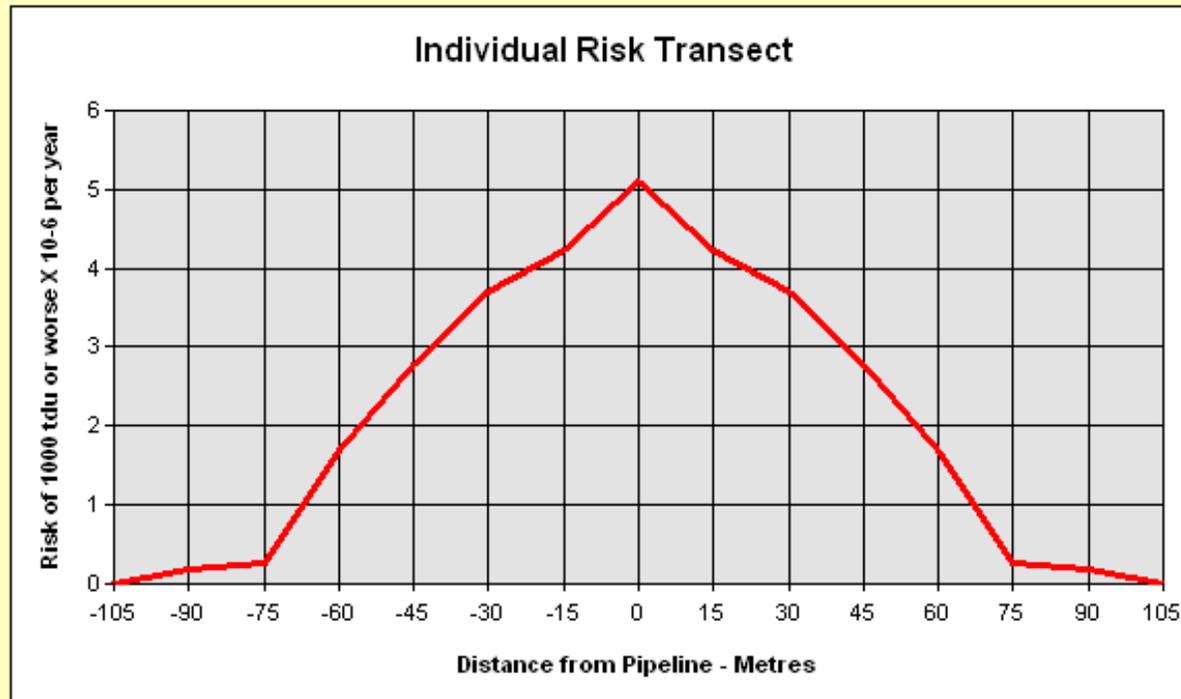
WARNING - Design factor - should be less than 0.3 in Suburban Ar

Failure Frequency Analysis from IGEM /TD/2 and PIE 3rd Party Predictive Model

Design Factor % SMYS **37**

3rd Party Extra Protection Risk Reduction Factor **1**

	Rupture	Hole	TOTAL	Rupture	Hole	TOTAL
3rd Party	0.0764	0.108	0.1844	29%	41%	70%
Corrosion	0	0.015	0.015	0%	5.7%	5.7%
Mechanical	0	0.064	0.064	0%	24.3%	24.3%
Ground Movement	0.00021	0	0.00021	0.1%	0%	0.1%
TOTAL	0.07661	0.187	0.26361	29.1%	70.9%	100%



IGEM/TD/1 Building Proximity Distance (Inner Zone) 17 metres

10⁻⁶ Risk (Middle Zone) Distance 69 metres

0.3 x 10⁻⁶ Risk (Outer Zone) Distance 72 metres

Pipeline Name Example Pipeline

Nominal Diameter mm 323.8

Nominal Wall Thickness mm 6.35

Grade of Steel X42

Operating Pressure bar 19

Area Classification Suburban

Approximate Age Pre-1980

Societal Risk Effect Distance (usually 1600 m) 1600

3rd Party Risk Reduction Factor (0.1 to 1) 1

This is the interaction distance - the length of pipeline which could affect the developments - if less than 1600m

This is the 3rd Party risk reduction/increase due to additional protection measures such as slabbing, extra markers, deeper or shallower cover, or extra surveillance - input a factor between 0.1 and 1.5

Press to Continue

Save as New Case

OK to proceed - open next tab

Failure Frequency Analysis from IGEM /TD/2 and PIE 3rd Party Predictive Model

Design Factor % SMYS **16.7**

3rd Party Extra Protection Risk Reduction Factor **1**

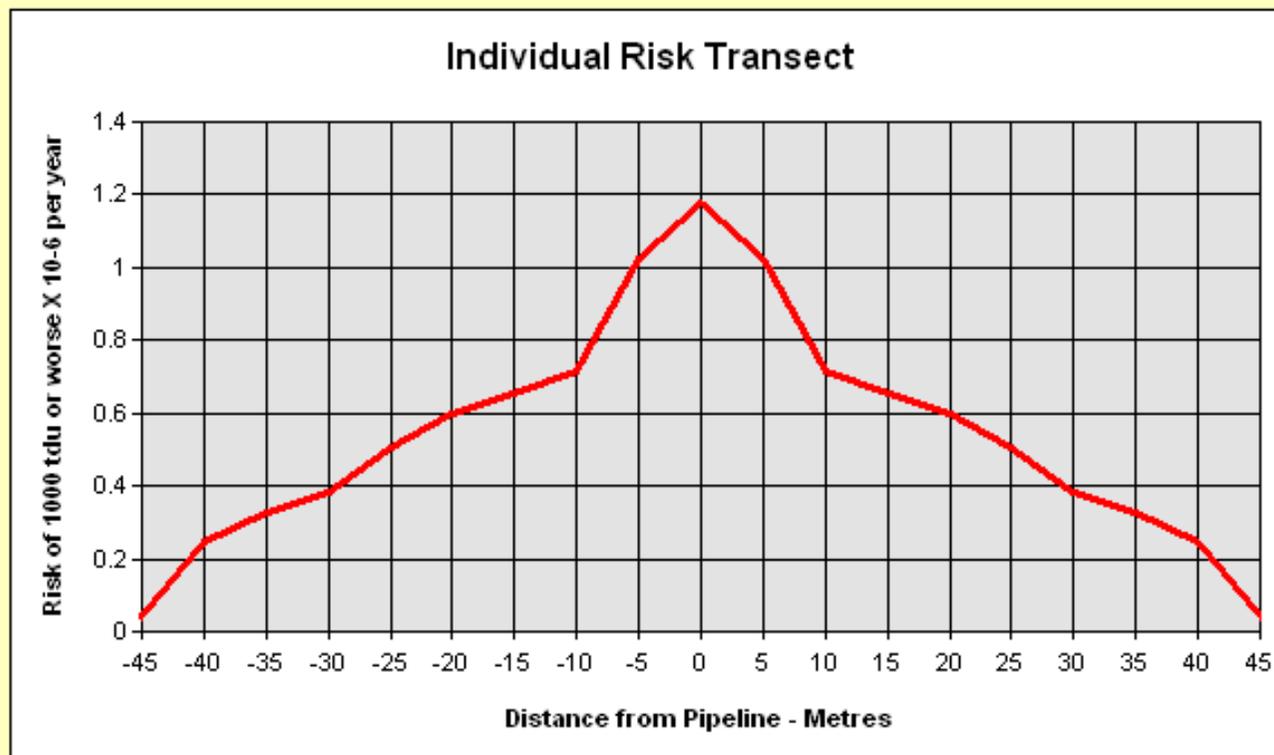
	Rupture	Hole	TOTAL	Rupture	Hole	TOTAL
3rd Party	0.0212	0.096	0.1172	10.8%	48.9%	59.7%
Corrosion	0	0.015	0.015	0%	7.6%	7.6%
Mechanical	0	0.064	0.064	0%	32.6%	32.6%
Ground Movement	0.00021	0	0.00021	0.1%	0%	0.1%
TOTAL	0.02141	0.175	0.19641	10.9%	89.1%	100%

Failure Frequency Analysis from IGEM /TD/2 and PIE 3rd Party Predictive Model

Design Factor % SMYS **37**

3rd Party Extra Protection Risk Reduction Factor **1**

	Rupture	Hole	TOTAL	Rupture	Hole	TOTAL
3rd Party	0.0764	0.108	0.1844	29%	41%	70%
Corrosion	0	0.015	0.015	0%	5.7%	5.7%
Mechanical	0	0.064	0.064	0%	24.3%	24.3%
Ground Movement	0.00021	0	0.00021	0.1%	0%	0.1%
TOTAL	0.07661	0.187	0.26361	29.1%	70.9%	100%



IGEM/TD/1 Building Proximity Distance (Inner Zone) metres

10⁻⁶ Risk (Middle Zone) Distance metres

0.3 x 10⁻⁶ Risk (Outer Zone) Distance metres

HSL latest advice on failure rates to HSE March 2010

Table [64] Proposed natural gas failure rates

<i>Pipeline diameter (mm)</i>	<i>Rupture</i>
<i>Mechanical failure</i>	
< 200	1.7×10^{-8}
200 - < 300	1.7×10^{-8}
300 - < 400	1.7×10^{-8}
≥ 400	1.7×10^{-8}
<i>Thickness Corrosion</i>	
< 5	1.3×10^{-6}
All 5 - <10	1.2×10^{-7}
≥ 10	10^{-8}

Based on UKOPA data

Table [72] Proposed gasoline failure rates

<i>Pipeline diame (mm)</i>	<i>Rupture</i>
<i>Mechanical failure</i>	
All	7.1×10^{-6}
<i>Corrosion</i>	
< 200	2.6×10^{-6}
200 - < 300	4.5×10^{-6}
300 - < 400	1.5×10^{-6}
≥ 400	4.2×10^{-6}

X 420

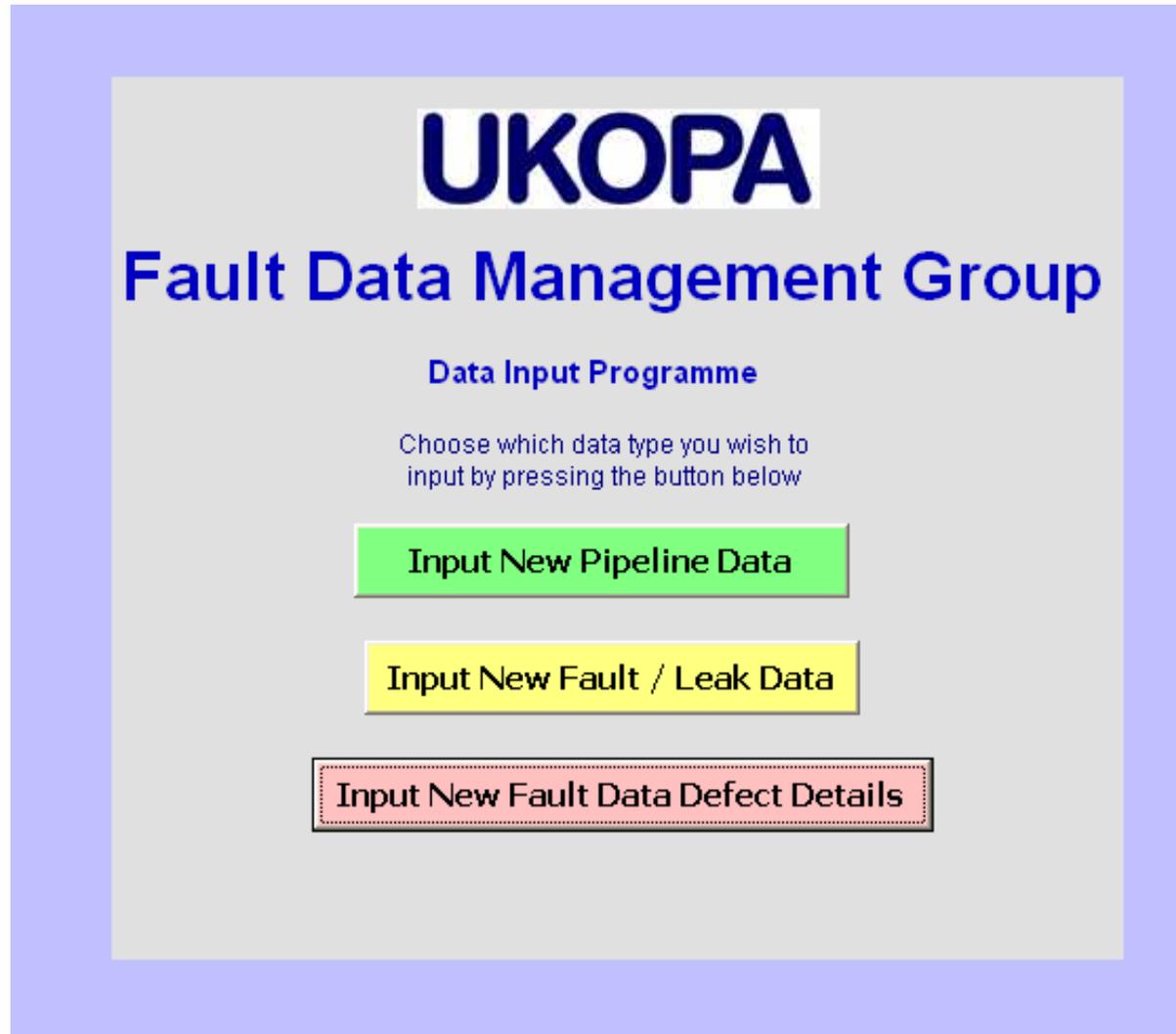
**X 2
to X 420**

Based on CONCAWE data

New Datasets – for each Company

- **1 file for Pipelines data**
- **1 file for Faults data (includes leaks and defects)**
- **reduced number data fields based on UKOPA and Company requirements**
- **data checking in progress**

New data input facility



The screenshot shows a web-based interface for data input. At the top, the UKOPA logo is displayed in large blue letters. Below it, the text 'Fault Data Management Group' is written in blue. Underneath, the heading 'Data Input Programme' is shown in blue. A line of text instructs the user: 'Choose which data type you wish to input by pressing the button below'. Three buttons are arranged vertically: a green button labeled 'Input New Pipeline Data', a yellow button labeled 'Input New Fault / Leak Data', and a pink button with a dotted border labeled 'Input New Fault Data Defect Details'. The entire interface is set against a light grey background within a blue border.



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INPUT PIPELINE DATA - SHEET 1

Move cursor over input box to obtain HELP on input data

Choose from drop-down list

1 Number in List 2 Pipeline Operator 3 Pipeline ID

4 Operator's Pipeline Name 5 Product

6 Product Phase 7 Outside Diameter mm 8 Wall Thickness mm

9 Design Pressure bar 10 Max Op Pressure bar 11 Construction Date (dd/mm/yyyy)

12 Date Pipeline Commissioned (dd/mm/yyyy) 13 Date Pipeline Decommissioned (dd/mm/yyyy)

14 Length below ground km 15 Length above ground km 16 Length elevated pipeline km

17 Length in rural areas km 18 Length in suburban areas km 19 Length in urban areas km

20 Construction Type 21 Design Specification 23 Manufacturer

22 Pipe Material 24 SMYS N/mm2 25 SMTS N/mm2 26 Charpy J

Check Data

Tab between items - data with in red frames must be entered to continue

Press to Save Data

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INPUT FAULT / LEAK DATA - SHEET 1

Move cursor over input box to obtain HELP on input data

1 Number in List

2 Pipeline Operator

3 Pipeline ID

View Pipeline List

4 Operator's Pipeline Name

Confirm Pipeline Selection

5 Operator's Fault Reference

6 Outside Diameter at Fault mm

7 Wall Thickness at Fault mm

8 Pipe Material

9 Construction Type

10 Ordnance Survey Map Ref.

11 Was there a defect?

12 Fault Centre Location

13 Pipeline Location Class

14 Fault Specific Location

15 How Discovered

16 How Discovered - Other How was the fault discovered? Select from the list, or add your own description - you can type in your own text if required

18 Fault- Comments

19 Operating Pressure

20 Action Taken

21 Fault Cause

22 Secondary Fault Cause

23 External Interference Cause (if any)

Check Data

Tab between items - data with in red frames must be entered to continue

Press to Save Data

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